

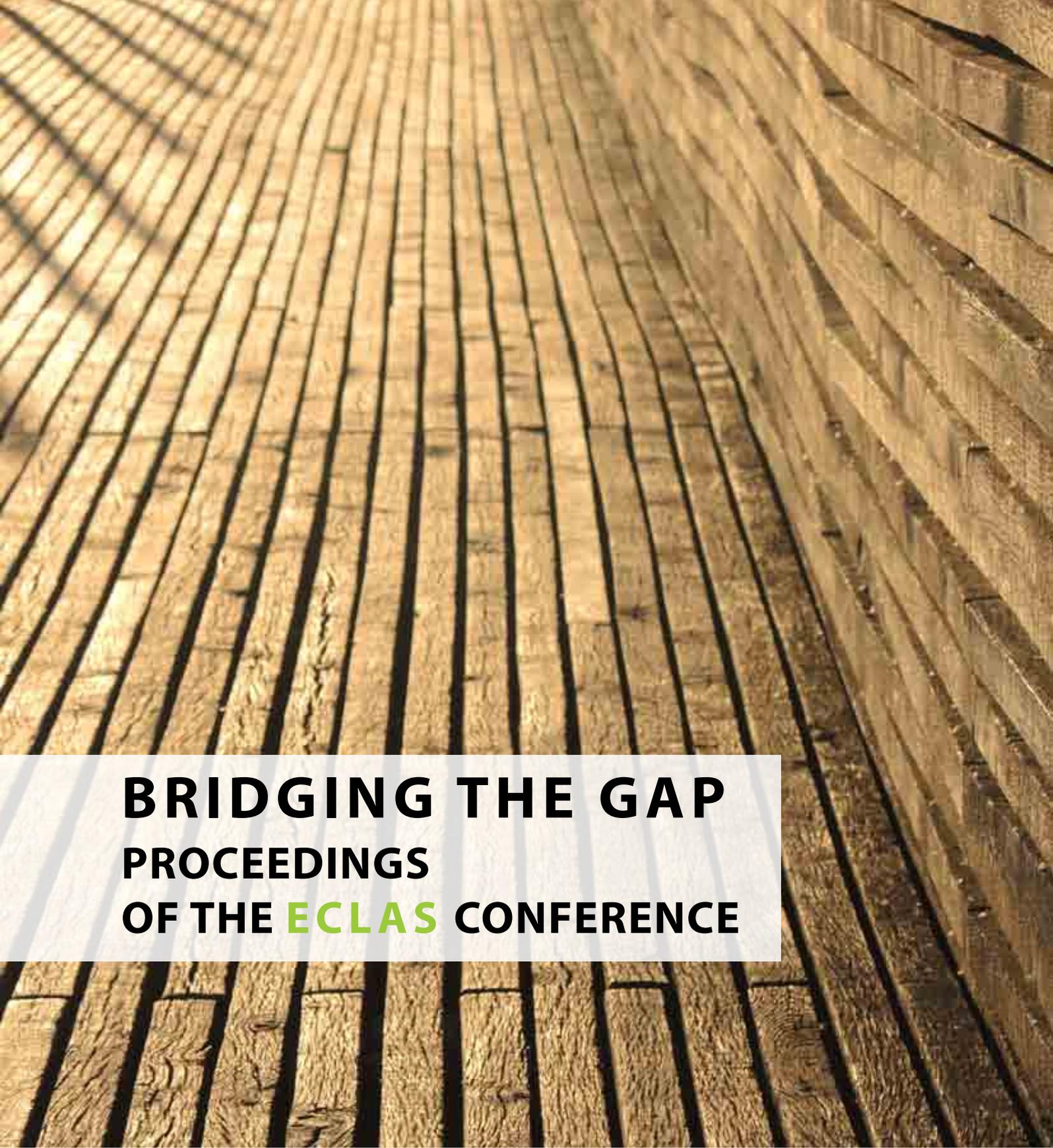
BRIDGING
THE GAP

HSR
HOCHSCHULE FÜR TECHNIK
RAPPERSWIL
FHO Fachhochschule Ostschweiz

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Haute école du paysage, d'ingénierie
et d'architecture de Genève

ECLAS
EUROPEAN COUNCIL OF
LANDSCAPE ARCHITECTURE
SCHOOLS



**BRIDGING THE GAP
PROCEEDINGS
OF THE ECLAS CONFERENCE**

Paul Bauer, Maria Collender, Michael Jakob, Lea Ketterer Bonnelame,
Peter Petschek, Dominik Siegrist, Christian Tschumi (Eds.)

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Table of Contents

Welcome to ECLAS 2016 Conference.....	15
Welcome to Rapperswil and the Campus of HSR.....	17
Becoming Relevant	19
anthos, the Swiss Journal for Landscape Architecture.....	21
Introduction.....	25
Keynotes.....	28
Work-Life.....	31
Bridging the Alps.....	35
Bridging the Gaps.....	39
The Rabbit's Eye View Understanding and Communicating Issues of Long-Term Plant Performance in Designed Landscapes.....	41
Gimme Shelter	47
Swiss Made – From Cultural Landscape to Landscape Culture	51
Full Papers	59
Landscape Design	61
Enhancing Heritage Landscape Performance Through Multifunctionally Designed Ecologies. Lessons from Florence MARIA-BEATRICE ANDREUCCI.....	65
Connections Among Scales in the Settlement Processes of the Sardinian Rural Landscape: The Gavoi Case. FEDERICO ARU.....	69
Advancing Landscape Architecture Research DIEDRICH BRUNS ANRI VAN DEN BRINK HILDE TOBI SIMON BELL.....	73
Weakcity. Notes on Landscape Urbanism ELISA CRISTIANA CATTANEO	77

Inside Out: Applying Experiential Learning During the 2014 Hong Kong Protests to an Urban Environmental Design Studio Context MELISSA CATE CHRIST	81
'Exploding to the Infinite': Dan Kiley's North Christian Church MARK EISCHEID	85
Design Principles and Guidelines: Bridging the Gap Between Science and Design RUDI VAN ETTEGER	89
Layered Landscape Design ALBERT FEKETE	93
Impact of Historical Zoos on Space Structure, Function and Infrastructure of Urban Public Parks ORSOLYA FEKETE KINGA SZILÁGYI	97
Bridging the Gap Between Landscape Architecture and Ecology in Teaching and Design Practice HANSJÖRG GADIANT CHRISTOPH KÜFFER ANDRÉ STAPFER	101
The Changing History of Klastromrét: One of the Emblematic Sites in Baia Mare ANNA IMOLA HENNING	105
Bridging the Gap Between Expertise and Engagement: an Exploration of Elegance and Design Process WENDY HODDINOTT	109
Residential Outdoor Territory Revitalization Experience in the Cities of Latvia UNA ĪLE AIJA ZIEMEĻNIECE DAIGA ZIGMUNDE NATALIJA ŅITAVSKA MADARA MARKOVA KRISTĪNE VUGULE	113
Bridging Gaps Between Landscape and Architecture in Norwegian Post-War Modernism KARSTEN JØRGENSEN	121
Bridges are Landscape Infrastructure Elements – A Method for Connecting a Bridge with Landscape and Infrastructure ANTONIA KOUKOUVELOU	125
Design as a Learning Process Utilizing Knowledge and Building up Knowledge PINAR KOYLU OGUZ YILMAZ	129
From Alley to Garden: Co-Creating Spaces Through a Build-Design Process BETTINA LAMM	133
River-Machine and Machines of the River FRANCESCO MARRAS	137
The Kunstgärtner ('Artistic Gardeners') of the 19th Century – Designers or Entrepreneurs? CLAUDIA MOLL	141
London Marsh – Part C: City of London Peter-Joseph-Lenné-Prize 2014 MARTIN AUF DER LAKE OLE CHRIST CHRISTIAN RÖPER SUPERVISION: CORNELIA MÜLLER	145

GIS-Applications in Landscape Design and Research STEFFEN NIJHUIS	149
Processes in Formation: Ecological Performance and Landscape Aesthetics PABLO PÉREZ RAMOS	153
Application of Urban Metabolism Approach in Energy Landscape Design ROBERTA PISTONI.....	157
Perspectives for Bridging the Gap Between Landscape Design and Research MARTIN PROMINSKI.....	161
Design of Air INDRA PURS	165
Integrating Cross-Discipline Collaboration into Landscape Architectural Curricula JAMES A. ROYCE	169
Educating City Landscape Designing in University of Life Sciences in Warsaw KINGA RYBAK-NIEDZIÓŁKA	173
Social Landscape Architecture as the Missing Link in the Shaping of Urban Public Spaces MAGDALENA RZESZOTARSKA-PAŁKA MAGDALENA CZALCZYŃSKA-PODOLSKA	177
Transforming the Urban Fabric – The Case Study of Freiburg HENRIK SCHULTZ	181
Application of Experimental Method in Landscape Design Education VESELIN SHAHANOV	185
Trespassing to the River to Reinstatement Individual and Public Health – Mind the Gap Between Impaired Inner and Outer Nature JOERG SIEWEKE.....	189
Weak Contexts in Evolution. Density and Limits of the Urban Margin of Cagliari. CLAUDIO SIRIGU.....	193
Different Ways of Interpretation of Historical Gardens by Landscape Architecture Students IVAN STANKOCI INGRID BELČÁKOVÁ	197
Creating Well-Rounded Designers of Prison Environments: Transdisciplinary Action Research, Design and Teaching JULIE STEVENS AMY WAGENFELD BARB TOEWS PATTI WACHTENDORF	201
Traces in the Landscape – An Alternative Memorial Design Practice SAREM JAMES SUNDERLAND	205
Islands in Landscape Architecture: Design, Abstractions and Metaphors MARTIN VAN DEN TOORN.....	209

Process and Product: The “Renaturalization” of the River Aire MARC TREIB	215
Making Meaning: Minds, Bodies and Media in Design Education TIM WATERMAN	219
Interdisciplinary Approach to Common Urban Landscape. Theory and Teaching Practice. ANNA WILCZYŃSKA EWA ZIELIŃSKA	223
Design-Build on the Frontlines: Most Important Questions DANIEL WINTERBOTTOM JULIE STEVENS ANDREW FOX	227
Landscape Planning.....	233
What is a Twenty-First Century National Park? Designing Scenarios for the Aotearoa New Zealand High Country MICK ABBOTT WOODY LEE XUEJING LI JACKY BOWRING	237
Residential Environment Toolbox for High Quality Development of Green Spaces in Urban Densification Processes CHRISTINE BAI URSINA LIEMBD SUSANNE KARN	241
Innovative Approaches to Developing Open Space in Swiss Agglomerations RETO CAMENZIND ANTHONY LECOULTRE	245
Place, Migration and Wellbeing: Landscape as the Environmental-Social Interface for Belonging SHELLEY EGOZ	249
Connecting Brescia’s Urban Sprawl: The ‘Park of Pits’ Case LUCA MARIA FRANCESCO FABRIS GUIDO GRANELLO	251
Planning for Biodiversity in Public Gardens and Squares: Two Cases in Porto, Portugal PAULO FARINHA-MARQUES CLÁUDIA FERNANDES FILIPA GUILHERME	255
Ecolecce. Landscape as Urban Development SARA FAVARGIOTTI JEANNETTE SORDI	259
Highlighting Landscape Events in the Way of Saint James: Rapperswil and Puente Villarente SAGRARIO FERNÁNDEZ RAGA CARLOS RODRÍGUEZ FERNÁNDEZ	263
Scattered Settlements – Redevelopment of Neglected Landscapes DANIELA GAŽOVÁ	267
Managing Cultural Landscape Diversity: From an EU and Local Perspective MOJCA GOLOBIČ	273
Back to Shanshui: Dwelling in the Mountains of Shihua Cave QIAN GUO RAN LI	277

Avoid – Mitigate – Compensate: How to Halt the Loss of Biodiversity in Urban Agglomerations? CHRISTIAN KÜPFER.....	281
Urban Planners’ Understanding of the Green Infrastructure Concept ELISA LÄHDE ELINA KALLIALA MARI ARILUOMA.....	285
Green Open Space Development in Dachang Under the Influences of Jing-Jin-Ji Regional Integration Policy JIJIAO LIU.....	289
Multi Temporal Mapping of Forest Landscape Change in the Mediterranean Region: The Mountain Bozdag EYLUL MALKOC ENGIN NURLU.....	293
Bridging the Gap: Indigenous Methods as Necessity to Heal Landscape and Enhance Cultural Identity BRUNO MARQUES ASHLEIGH HUNTER KURT COLE.....	297
Planning and Designing for the Visitation of a Roman City Landscape – Tongobriga ANA MEDEIROS CLÁUDIA FERNANDES.....	301
Greening Brownfields with Open Space Strategies in Sakai City, Japan MIYAGAWA TOMOKO OTSUKA NORIKO KUROSE TAKEFUMI ABE HIROKAZU.....	307
Transiting Cities: Mediating Change for Uncertain Futures ROSALEA MONACELLA CRAIG DOUGLAS.....	311
Landscape Architecture in elop* Transdisciplinary Projects NATHALIE MONGÉ KATHRIN MERZ.....	315
Visual Methods in Landscape Architecture Research DANIEL MÜNDERLEIN DIEDRICH BRUNS.....	319
Bridging Landscapes and Cultures Within the International Summer School's Experience DAIGA ZIGMUNDE NATALIJA ŃITAVSKA MADARA MARKOVA UNA ĪLE KRISTĪNE VUGULE.....	323
Turning Gaps into Bridges: Towards Integral Management of Landscapes NADJA PENKO SEIDL.....	327
Factors Influencing Public Perceptions Of Wind Parks: A Laboratory Test Using Video-Acoustic Simulations ROBERT RIBE MADELEINE MANYOKY ULRIKE WISSEN HAYEK ADRIENNE GRĒT-REGAMEY.....	331
Landscapes by Extraction: Contemporary Approaches to the Roman City of Tiermes, Spain CARLOS RODRÍGUEZ FERNÁNDEZ SAGRARIO FERNÁNDEZ RAGA.....	335
Understanding Uncertainty in Cultural Landscape. A Hermeneutical Approach to Catastrophe JAVIER RUIZ SÁNCHEZ MATTIA BERTIN.....	339
Implications of the EU Revisions of the Environmental Impact Assessment (EIA) for Landscape Planning OLAF SCHROTH.....	343
An Assessment of the Relative Contribution of Private Residential Gardens to the City-Wide Green Space Benefits and Services: The Case of Tartu, Estonia. HIMANSU SEKHAR MISHRA SIMON BELL.....	347

The Use of Green Outdoor Environments for Cardiac Survivors' Rehabilitation Therapy SHUREEN FARIS ABDUL SHUKOR NUR SYAKIRA AMIRA AMAT SUHARDI MAULAN SA'ARI MOHAMAD YATIM.....	351
The Identification of the 'Nature Index' in Malaysian Landscape SHUREEN FARIS ABDUL SHUKOR SHAMSUL ABU BAKAR MOHD NASIR BAHARUDDIN.....	355
R-Types – Development of a Typology of Recreationists as a Base for Planning and Design of Nature-Based Recreation Areas LEA KETTERER BONNELAME DOMINIK SIEGRIST.....	359
Landscapes of Water – How can Mapping in Inundation Areas Create new Planning Tools? ELISABETH SJÖDAHL.....	363
People's Preferences for Outdoor Affordances are Relatively Similar Irrespective of Cultural Background ERIK SKÄRBÄCK PATRIK GRAHN.....	367
Putting People First! Exploring How to Improve Public Participation in Planning: Case Studies from Latvia and Estonia JOANNA T. STORIE SIMON BELL.....	371
Overcoming the Institutional Approach to Protection Through Landscape Modeling DORA TOMIĆ RELJIĆ SONJA BUTULA INES HRDALO PETRA PEREKOVIĆ GORAN ANDLAR.....	375
How Can Urban Designers Take Advantage of the Invisibilities when Designing Urban Environments with Local Citizens? LAURA WINGE.....	379
Bringing Landscape Visualization Tools to Practice: Prerequisites for Successful Development Approaches ULRIKE WISSEN HAYEK ADRIENNE GRÊT-REGAMEY.....	383
Planning and Design of Urban Green Networks in Stockholm NA XIU.....	387
Construction/IT.....	393
Time, Design and Construction: Learning from Change to Built Landscapes Over Time. SIMON COLWILL.....	397
Digital Communication of Knowledge for Academic Design-Build Initiatives SIMON COLWILL.....	401
Scale Matters, but Often Size is Meant ! A Critical Interjection About Scales ULRICH KIAS.....	405
Design Analysis and Validation of Digital Terrain Models JOSÉ MIGUEL LAMEIRAS PAULO FARINHA-MARQUES.....	409

Teaching Materials and Construction @ University of Porto ISABEL MARTINHO DA SILVA	413
Integrating Cross-Discipline Collaboration into Landscape Architectural Curricula JAMES A. ROYCE	417
Constructing Identity: Lessons from the Sky Lounge ROBERTO ROVIRA	421
Teaching Landscape: Effective Exercises in Landscape Detailing as Poetic Construction ANNA-MARIA VISSILIA JULIA GEORGI	425
Teaching the Craft of Landscape Architecture: A Design/Build Approach DANIEL WINTERBOTTOM	429
Forging Innovative International Partnerships: A Design/Build Collaboration, Universities of Washington and Zagreb DANIEL WINTERBOTTOM STANKO STERGARŠEK IVA RECHNER DIKA	433
Plant Design.....	439
Fractal Planting: Reorganising Forest, Farming and Cultural Landscape in Canterbury, Aotearoa New Zealand MICK ABBOTT KATE BLACKBURNE JACKY BOWRING CHARLOTTE MURPHY	443
Thematic Gardens as a Presentation of the Results of Research and Artistic Activities ZUZANA AMBROŽOVÁ	447
The Art of Planting in Landscape Design GABRIËLLE BARTELSE MARNIX TAVENIER	451
Playful and Active Research-Based Learning in Planting Design? SWANTJE DUTHWEILER	457
A Multi-Method Approach to Teach Planting Design in a Post-Bologna Era PAULO FARINHA-MARQUES CLÁUDIA FERNANDES	461
Experimental Design and Maintenance of FCUP “Wild Garden”: Researching and Learning Urban Nature PAULO FARINHA-MARQUES CLÁUDIA FERNANDES FILIPA GUILHERME	465
Hart Island – A New Cultural Dimension Through Ecological Recovery ANN SHARROCK IAN FISHER	469
Integrating Agroforestry Practices Within the Springsbury Arboretum NATHAN HEAVERS	473
Urban Tree Concepts in a Changing Climate: A Practical Instrument for Specific Implementation in Swiss Cities MARK KRIEGER VIOLA THIEL	477

Opportunities and Risks Using Exotic Species in Planting Design – How Should We Present Non-Native Plants Within Teaching? NORBERT KÜHN.....	481
Garden of Retirement Dementia, Katharina-von-Bora-Haus – International Ulmer Prize 2013 ALMUTH BENNETT KRISTINA GRIESE DOROTHEE REHR SUPERVISION: CORNELIA MÜLLER.....	485
'Plant Templates' in Garden Design and Planting Plan Teaching IZABELA MYSZKA-STĄPÓR BEATA J. GAWRYSZEWSKA.....	489
Natural Planting Design and Public Open Space – Lessons from Applied Research in Lower Austria SABINE PLENK PAUL NEUNINGER.....	493
Urban Vegetation for Bioretention in Cold Climates – A Short Interval Flooding Test in Finland OUTI TAHVONEN.....	497
Adaptive Planting Design. Vegetation as Tool to Solve (Existing) Problems CATARINA PATOILLO TEXEIRA CLÁUDIA FERNANDES.....	501
Origins and Contemporary Use of Planting Design in Landscape Architecture MARTIN VAN DEN TOORN.....	505
The Street Raingardens – Students' Research for Urban Street Areas Solution on Example of Łomianki EWA ZARAŚ-JANUSZKIEWICZ BEATA FORMAL-PIENIAK BARBARA ŻARSKA.....	509
Teaching Landscape.....	515
New Challenges for Landscape Architecture Education Due to Changing Demands of Urban and Landscape Development in Switzerland RAPHAEL AEBERHARD.....	519
Moving Design: Video as a Teaching Tool for Landscape Architecture DAVID ESCUDERO.....	523
Hands-On! Engaging Students in Green Spaces Maintenance Resorting to Fieldwork Protocols CLÁUDIA FERNANDES.....	527
Teaching Planting Design at a University of Technology: Bridging the Gaps KATARINA KRISTIANOVA.....	531
Hybrid Actions into the Landscape: In Between Art and Architecture CONCHA LAPAYESE RODRIGO DE LA O FRANCISCO ARQUES.....	535
Bridging by Educating: Study Programme “Composition of Garden” for U3A-students LUBICA LEŠINSKÁ.....	539
Mobile Applications and New ICT Tools in Landscape Architecture Teaching Practice GABRIELA MAKSYMIAK KINGA KIMIC.....	543

Using Different Formats of Case Studies in Teaching Subjects Related to Landscape Design MAŁGORZATA KACZYŃSKA	547
Teaching How to Track Landscape Experience CATHY MARSHALL.....	551
The Is-Ought Gap: A Door Opener for Teaching Ethics in Landscape Planning ALBRECHT MÜLLER.....	555
The Lure of the Australian Outback: Designing in the Field and on the Road ANDREW SANIGA.....	559
The Use and Value of Learning with Plants MARCEL ROBISCHON KATJA SVENSSON	563
Sustainable Garden Design: Students' Perspectives in the "Flower of Life" International Competition JEROEN DE VRIES MARIA-BEATRICE ANDREUCCL.....	565
Posters.....	571
Conference Schedule	581
Organizing Institutions	585
HSR Hochschule für Technik Rapperswil The Degree Programme of Landscape Architecture	587
HSR Hochschule für Technik Rapperswil Institute for Landscape and Open Space.....	588
The Degree Programme of Landscape Architecture at hepia, Haute École du Paysage, d'Ingénierie et d'Architecture de Genève	589
Grün Stadt Zürich.....	590
Index	593

Welcome to ECLAS 2016 Conference

SIMON BELL, ECLAS PRESIDENT

Dear ECLAS members and guests, it is with great pleasure that I, as President of ECLAS, welcome you to join our 2016 annual conference at the HSR Hochschule für Technik Rapperswil. Each year a different school hosts the conference and offers a theme for bringing together academics from all over Europe and beyond. This year, “Bridging the Gap” has been chosen. It is very relevant, since landscape architecture, as a disciplinary field, sits in the middle of, or at the junction between, a number of disciplines or fields of activity and one of the challenges we face as academics or practitioners is how to work together and communicate effectively with colleagues. In our conferences we offer scope for several different types of paper and presentation: traditional reporting of research (increasingly important as we try to build up the evidence base for landscape architecture), critique of practice, theoretical development and teaching methods and approaches. This last one is also a very important and popular aspect, since we are the organisation representing landscape architecture schools, with education at the heart of what we do.

However, the conference is not only about listening to interesting and provocative presentations. It includes the doctoral colloquium, where research students have a chance to network and share their work and discuss common issues. We also have a meeting of the group representing the heads of schools, the people struggling with staffing, programmes, budgets and academic challenges of all kinds. We have the ECLAS General Assembly, where the main decisions of ECLAS are made. We also have many opportunities for meeting friends, old and new, and for meeting and making new friends from around the world. Landscape architecture is not a huge field so it is possible to get to know almost all the main people and to develop close networks and good friendships. The social side of the conference is therefore very important. Field trips round off the conference and offer chances to see the landscapes of the local area with perspectives which normal tourists do not get.

So, once again, welcome to ECLAS 2016 and please make the most of the opportunities we offer as an organisation and which have been prepared very efficiently – as we would expect from our Swiss hosts – here in Rapperswil. I am sure the conference will live up to the standards and expectations we have set in previous conferences.

Welcome to Rapperswil and the Campus of HSR

PAUL BAUER, MICHAEL JAKOB, LEA KETTERER BONNELAME,
PETER PETSCHKE, DOMINIK SIEGRIST, CHRISTIAN TSCHUMI

Welcome to Rapperswil and HSR Hochschule für Technik Rapperswil. We are very honored to be able to host the main landscape education and research event in Europe in 2016. The Department of Landscape Architecture and the Institute for Landscape and Open Space of the HSR Hochschule für Technik Rapperswil is hosting this conference in partnership with the Department of Landscape Architecture of the University of Applied Sciences Geneva (hepia).

We welcome you to Switzerland, a small country in the middle of Western Europe, which has always maintained close relations with its neighbouring countries. Thus, while Switzerland is a place with a rich national landscape architecture tradition, landscape architects from abroad have also continuously contributed to the profession in Switzerland and left a heritage of lasting value. With the four national languages German, French, Italian and Rhaeto-Romanic as well as many other languages from all over the world, bridging the gap between languages and cultures poses an everyday challenge to the people of this country. This also applies to the cooperation between the two universities of applied sciences Rapperswil and Geneva, with one teaching in German and the other one in French. The conference venue Rapperswil is a historic small town at the upper lake of Zurich, half an hour away from the city of Zurich. The campus is located in a unique place right on the lake with views of the Alps. A visit to the old town of Rapperswil is well worth as is a trip to Zurich, which sees itself as the smallest cosmopolitan city.

Good landscape architecture possesses a high priority in Switzerland, and for Swiss landscape architects a look across national boundaries has always been an important part of their profession. Some have been engaged with international projects and forming international associations which still continue today.

Therefore, we are particularly pleased to take up and deepen the connections with the landscape architecture in other European and non-European countries. In the spirit of the conferences' theme: Bridging the Gap.

Becoming Relevant

PETER WULLSCHLEGER, BUND SCHWEIZER LANDSCHAFTSARCHITEKTEN
UND LANDSCHAFTSARCHITEKTINNEN

Landscape architects make significant contributions in answering current issues that relate to the quality of our environment. These important tasks and contributions require specialist training. The Professional Association of Swiss landscape architecture recognizes this, and puts particular focus and commitment towards the education of young people.

Swiss landscapes and open spaces contribute significantly to the identity of the country, and are an expression of its cultural diversity. They create an important basis for the quality of life of the population, business location and tourism, as well as expressing and supporting cultural heritage. Due to population growth, there is an ever increasing demand for mobility, infrastructure and housing. This puts pressure on the open countryside, as well as developed sites and its urban open spaces. The reality of this situation is exacerbated within already developed areas.

Regarding this issue, landscape architects make significant contributions. And their areas of expertise are ever expanding and becoming more diverse: The development of settlement areas, urban sprawl, climate change and natural hazards, structural changes in agriculture, the growing recreational use of the Alpine region. These are some of the areas in which specially trained experts are required.

A Lack of New Recruits

In Switzerland, there is an acute shortage of qualified professionals. The reason for this is partly due to the constantly changing requirements in landscape architecture, as well as the small number of students who annually qualify at bachelor level. Every year in Switzerland there are approximately 100 new jobs created for landscape architects. Unfortunately the average 50 graduates from courses in Switzerland who join the industry, are unable to cover the demand. This lack of professionals are then recruited from abroad, from which the majority have master's degrees from Universities or technical colleges. However the international job market within this industry today is also stretched, therefore recruiting from abroad can be difficult and requires time and effort.

A Study of the Educational Situation

A recently published study, commissioned by the BSLA clearly identified the undergraduate programs offered at the HSR and HEPIA are the two leading colleges training landscape architects in Switzerland, and will remain so in the foreseeable future. New graduates are sucked into the industry after qualifying, which has reduced the need for them to develop further basic training.

In order to improve the staffing situation in the landscape architecture industry, a study recommends to focus primarily on the following four aspects: encouraging young people to choose a career in landscape architecture, visual advertising of the profession, active promotion of existing master's courses, promoting cooperation between different colleges, as well as between schools and practice.

landschaftarchitektur.ch

In October 2015, the new site landschaftsarchitektur.ch was launched online.

A joint project between BSLA, HEPIA and HSR which was directed explicitly towards young people, with the aim of promoting landscape architecture as a more attractive career choice.

Learning establishments and associated professionals hope to use the project to deal with the pressing and problematic situation of the lack of new recruits to the profession. The information platform presents the profession through the use of short texts and images of successful projects, the site also includes a film of the new redevelopment in the Letten area within Zurich. Alongside this a series of postcards were published referring to the website (landschaftsarchitektur.ch). The next phase, to commence autumn 2016, is an online campaign targeted to make young people aware of the platform. The final third phase hopes for landscape architects to make contact and communication within schools, and so more directly inspire students of the profession.

National Campaign 'Gartenjahr 2016' – a Tool to Spark Interest

2016 is 'Gartenjahr'. This year throughout Switzerland a variety of events are taking place as a part of the national campaign «Gartenjahr 2016 – Raum für Begegnungen» which translates as «2016 Year of the Garden – Spaces for encounters» The campaign draws attention to the importance of gardens and open spaces which contribute to the quality of life in our cities. Occasion and focus of the campaign is due to increasing pressures on urban free spaces, a consequence of densification. Organisers are the BSLA and five further national institutions, and the campaign is financed by national funds. With the aim to enable a wider professional discussion, and greater awareness of the issues to the public.

Local authorities, professional bodies, garden enthusiasts, schools, as well as arts and cultural councils were invited to support the campaign and their aims, with events and projects.

During the campaign, the organisers put forward specific demands to politics and administration at all levels. The start of 2017 will see a publication of the final document, summarising the results and findings of the Gartenjahr.

Golden Times

The positive development and the growing demand for landscape architects in Switzerland are also reflected in an increase in members of the Professional Association. It is pleasing, and shows it makes sense to approach large tasks together. However this success has a bitter aftertaste. It can be compared to the medical field: where an increasing demand for care, can be interpreted as a decrease in the health of the population.

The patients “free space and landscape” are not yet in intensive care, however the concern about loss and potential harm is leading to an increased need for care. Only with a well-developed maternity ward can the clinic “landscape architecture” be equipped for future challenges.

anthos, the Swiss Journal for Landscape Architecture

SABINE WOLF, ANTHOS

Abroad, Switzerland is appreciated – alongside its internationally important banking sector – in particular for its varied, unique and impressive landscape, ranging from the wild natural scenery of the Alps to the manmade farmlands and woodland, and not least the diverse townscapes. The latter do not happen by chance, but are the result of sustainable and co-ordinated planning by landscape architects and allied professions. anthos, the Swiss journal for landscape architecture, edited by BSLA, is now in its 55th year of portraying and criticizing, characterizing and transmitting the strategic, planning and architectural development of Swiss landscapes.

Turbulent Early Years

The first issue appeared in March 1962. From the outset, the publisher was the Bund Schweizer Landschaftsarchitekten und Landschaftsarchitektinnen (BSLA, 'Association of Swiss Landscape Architects', then still known as the Bund Schweizerischer Garten- und Landschaftsarchitekten (BSG, 'Association of Swiss Landscape Gardeners and Architects'). A relatively small professional body was thus launching its own specialist journal, which was for the time, and not only then, a visionary and courageous decision. anthos was pursuing the aspiration of making Swiss landscape architecture visible beyond the borders of Switzerland, and thus getting involved in the international discourse; logically enough, then, it appeared in three languages: German, French and English.

Swiss landscape architects already enjoyed considerable international acclaim by that time. They played an active role in the foundation and organization of the International Federation of Landscape Architects (IFLA); Walter Leder, himself Swiss, was its president from 1954 to 1956. Zürich was a focus; the 5th IFLA World Congress took place here in 1956, and not long afterwards, the noted garden design exhibition G|59. Grün80 in Basel built on these successes, guests visited Switzerland to learn about the high quality of the landscape architecture.

The strategic goals of anthos, namely to help the profession at home and abroad to become more relevant, to present its manifold fields of activity and also to convey to the public the importance of landscape architecture for designing the future, were set high. The development was stormy, sometimes adventurous to say the least, and every new issue was a challenge, not least to satisfy the high quality aspirations. Even the procurement of contributions was, in the early years, far more difficult than it is today – personal computers and the internet were only invented later.

5 Central Pillars

The anthos concept was based from the start on five pillars that for the most part continue to determine the contents of the quarterly issues:

- The journal covers the entire spectrum and complexity of the landscape architecture field, from the design of tiny private gardens to the planning of large landscapes, from overarching concepts to the details of execution.

- The editions are each themed, and devoted to an individual concrete focus geared to current questions, supplemented by a rubric section of archive character.
- Examples from actual practice and solutions as well as basic and background articles are in a mutually balanced relationship.
- The content is focused on Switzerland, but important international references are actively sought, while exchange between countries and disciplines is deliberately fostered.
- All contributions appear in German, French and English.

The three-language policy had to be abandoned in 1996; English was deleted, to the regret of many. Because of the commitment of the Swiss landscape architects in the IFLA, from 1962 to 2003 anthos was their official communication forum, as it still is for the Vereinigung Schweizerischer Stadtgärtnereien und Gartenbauämter (Union of Swiss Urban Green Spaces Departments, VSSG).

Finger on the pulse of the age

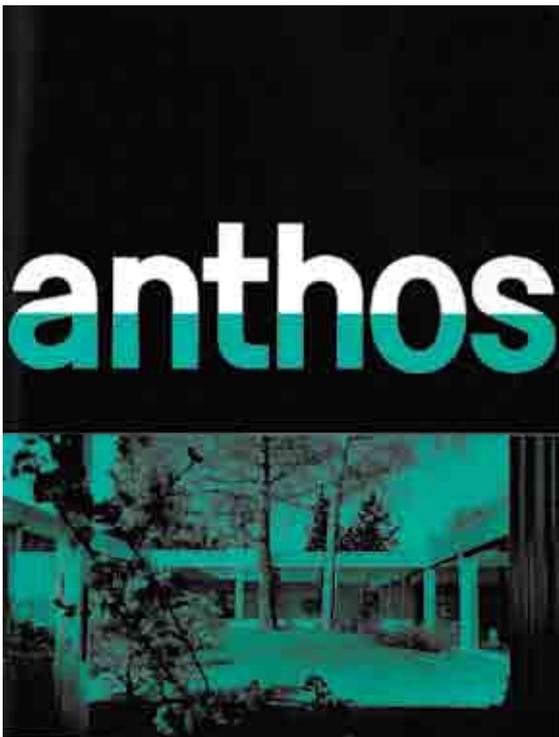
A look back on earlier anthos editions is like time travel through the central themes of the decades: 'Integrating motorways into the landscape' (1962), 'Remit and importance of urban green spaces' (1969), 'European Nature Conservation Year 1970', 'Dwellings Fit for Humans' (1972), 'IFLA Congress 1976 Istanbul', 'Grün 80', 'Threatened landscapes' (1985), 'Earmarked open spaces' (1989), 'CAD – GIS – EBV' (1993), «IFPRA European Congress 1994 in Bern', 'Lausanne Jardins '97', 'Gartenschau – Expo – Olympiade' (2000), 'Everyday landscapes' (2005), '48th IFLA World Congress 2011 in Zürich', 'Landscape as added value – BSLA/IBA Basel 2020 Landscape Congress 2014'.

anthos is thus not just topical, but forms a rich compendium of the history of Swiss landscape architecture across half a century. anthos was and is a window on the world, for professional partners, administrators and politicians. We are very pleased that anthos has been able to establish itself as the mouthpiece of Swiss landscape architecture, taken note of at home and abroad, proclaiming attitudes, representing opinions and enriching the specialist discourse. When landscape architects today, and their professional organization the BSLA, now enjoy greater recognition in Switzerland, anthos has played a large part in this.

We consider it an honour that time and again we have the privilege of accompanying, as media partner, such leading events as this year's conference of the European Council of Landscape Architecture Schools ECLAS, 'Bridging the Gap', from 11–15 September 2016 at the HSR Hochschule für Technik Rapperswil als Medienpartner.

We wish all those attending a successful event with productive encounters and conversations.

Further information: www.anthos.ch and @anthosmagazine (Twitter)



References

- Schubert, Bernd: 25 Jahre anthos: 'ein Bilderbuch' zum Jubiläum. Anthos 4/1986, p. 1–3.
Schubert, Bernd: 50 Jahre am Puls der Zeit. anthos 4 / 2012, pp. 60–62.
Schubert, Bernd: Anthos vor 30 Jahren. Anthos 1/2000, p. 80.
Stöckli, Peter-Paul: 20 Jahre 'anthos'. anthos 4/1981, p. 1–6.

Introduction

LEA KETTERER BONNELAME, PETER PETSCHKE UND DOMINIK SIEGRIST,
HSR HOCHSCHULE FÜR TECHNIK RAPPERSWIL

Landscape architecture, design and planning are constantly confronted with the issue of boundaries and gaps – with linguistic and cultural boundaries, with contradictions between teaching and research, and with competition between universities of applied sciences and universities. At the same time, educational institutions in landscape architecture provide opportunities to overcome boundaries and gaps through the instruction of modern working and communication technologies, the application of inter- and trans-disciplinary methods and cross-cultural cooperation in education and research. The host institutions HSR in Rapperswil and hepia in Geneva are universities of applied sciences, where education is of foremost importance. Thus, current experiences and developments in teaching are the focal point of the ECLAS Conference 2016.

The ECLAS 2016 conference invited authors to prepare contributions under the four sub-themes Landscape Design, Construction/IT, Landscape Planning and Planting Design, some including a specific focus on teaching landscape:

Landscape Design

Landscape Design stands at the heart of landscape architecture. However, compared with architecture, the specificities and methods of what is intended by designing landscapes is still an open question. Are landscapes designed or is it rather project changes that impact landscapes? Bridging the gap – looking both from inside and outside of the discipline and being receptive to the dialogue with contemporary urbanisms or architecture philosophies will allow for a better defined Landscape Design in the future.

- What specifically is Landscape Design and what methodologies are encompassed within Landscape Design?
- How can we open the dialogue of our discipline?
- How is Landscape Design best taught?

Construction/IT

Construction is comprised of grading, drainage, materials, and structures. Therefore how construction is taught plays a very important role in the landscape architecture education. Furthermore, construction research in landscape architecture is very necessary. Architects, Structural and Civil Engineers cover a wide range of construction topics. The following questions arise:

- How to combine design and construction in teaching?
- How to combine teaching construction and research?
- How to teach “design to cost”?

- Between academic and commercial – bridging the gap. Are collaborations appropriate? What is the professional world demanding, what can universities deliver?
- What elements of construction should be incorporated into the landscape architecture curriculum, and to what scope? What should we leave to architects, structural and civil engineers?

IT The application of computers in landscape architecture in the form of Computer Aided Drafting (CAD) started approximately 30-35 years ago in the area of construction drawings. It is now common to prepare all construction documents with computers. Handhelds are used in order to control construction workflows on building sites; robots are able to build walls. Roads are built by GNSS machine guidance systems. This poses the following questions:

- What should we teach besides CAD? What makes sense in CAD education (2D, 3D, civil engineering software)?
- Will robots become more dominant at landscape construction sites?
- High-tech surveying tools like drones and laser scanners, 3D printers and even smart phone construction apps – who can manage and afford all this equipment? How to keep up with the latest developments?

Landscape Planning

Landscape Planning extends to all areas and spatial scales. These range from large-scale cultural and natural landscapes to urban and peri-urban sprawls – bridging the gap. High quality landscape development adds to the well-being and health of the population, nurtures cultural values, and preserves ecological habitats and biodiversity of flora and fauna. The following questions arise:

- How is a good landscape quality defined?
- What is the role of design in Landscape Planning?
- On which methods does good research in the field of Landscape Planning focus on?
- What defines good teaching in the field of Landscape Planning?

Planting Design

Planting Design: Plants are the primary material of landscape architecture. They are of foremost importance in garden projects. Landscape Architect Dieter Kienast looked at gardens as a testing ground for his design ideas. He later applied them to larger projects. Garden Design was neglected in university education for many years. Today the introduction of vegetation into the curriculum and vegetation research has led to the field Planting Design. It is time to talk about plants, gardens and how to approach it and the methods for teaching it. The following questions arise:

- What is the best teaching method for the topic of designing with plants?
- How to teach vegetation and research results in the field of Planting Design
- How to apply economical Planting Design in landscape architecture?
- How to combine Planting Design and plant maintenance in projects?
- Is it still useful to teach classical knowledge of plants in times of internet and smart phone apps?
- How to teach Planting Design to students with landscape apprenticeship or high school background?

Teaching Landscape

Teaching all aspects of landscape architecture is one of the most important tasks of our universities. The foremost is to convey the artistic, scientific, socio-cultural and economic foundations. Building on this, students acquire specific skills that they can apply in their professional activities. It needs to be considered that these requirements are constantly developing/evolving.

Landscape architects must therefore be familiar with the latest methods, be it in the design, planning or in technical areas. Teaching Landscape includes modern and innovative approaches to the delivery and implementation in the education of landscape architecture .

The proceedings for the ECLAS Conference 2016 includes five keynotes, followed by 118 full papers and 5 posters. Full papers are listed in alphabetical order of authors each within respective subthemes. The proceedings are also complemented with a short written profile of the organizing institutions as well as the conference programme.

Keynotes



CHRIS REED (USA)

**Assoc. Prof. in Practice of Landscape Architecture,
Harvard University, Cambridge/MA**

Chris Reed is the founding principal of Stoss. His innovative, hybridized approach to public space has been recognized internationally, and he has been invited to participate in competitions and installations in the United States, Canada, Europe, Israel, the Middle East, Taiwan, and China. Reed's research interests include the impact of ecological sciences on design thinking, and citymaking strategies informed by landscape systems and dynamics; he is co-editor of an upcoming volume of research and drawing titled *Projective Ecologies*. Reed received a Master in Landscape Architecture from the University of Pennsylvania and an AB in Urban Studies from Harvard College. He is currently Associate Professor in Practice of Landscape Architecture at the Harvard University Graduate School of Design.



PAOLO L. BÜRGI (CH)

**Landscape Architect, Studio Bürgi, Camorino/
Switzerland; adjunct professor of Landscape
Architecture, University of Pennsylvania; professor,
Istituto Universitario di Architettura di Venezia and
Politecnico di Milano**

Paolo L. Bürgi is a free-lance landscape architect based in Camorino, Switzerland. He is adjunct professor of Landscape Architecture at the University of Pennsylvania, professor at the Istituto Universitario di Architettura di Venezia and at the Politecnico di Milano. He has participated in many international competitions winning several prizes, such as the Open-air museum in Gorizia's Karst, Italy; the 'CERN-Route de Meyrin' in Switzerland or the 'Helsinki Toolonlathi Parks' in Finland. Bürgi has presented papers at conferences in Canada, USA, Argentina, Chile, Korea, China and throughout Europe, and his work has been published in a wide range of specialist literature. In 2009 a monographic book has been published for Princeton Architectural Press: "Paolo Bürgi. Landscape Architect. Discovering the (Swiss) Horizon: Mountain, Lake and Forest" and in 2011 followed for Casa Editrice Libria, Melfi: "Paolo Bürgi. Paesaggi-Passaggi". In 2003 Bürgi received the 'European Landscape Award Rosa Barba' in Barcellona for the Cardada project, and the 'Die Besten 03-bronze Award' for the project 'Kreuzlingen Hafenplatz', Switzerland.



RAFFAELLA F. GIANNETTO (USA)

**Raffaella Fabiani Giannetto, Ph.D.
Assistant Professor
Department of Landscape Architecture
University of Pennsylvania, School of Design**

Raffaella Fabiani Giannetto teaches garden and landscape history and theory at the University of Pennsylvania School of Design. Her research interests focus on the Italian Renaissance garden, its legacy and historiography. In addition, she maintains an interest in contemporary landscape architecture, its theory and criticism. She is the author of *Discovering the Swiss Horizon: Mountain, Lake and Forest* on the work of landscape architect Paolo Bürgi (Princeton Architectural Press, 2009) and *Medici Gardens: From Making to Design* (University of Pennsylvania Press, 2008), for which she received the Elisabeth Blair MacDougall Book Award in 2010. Fabiani Giannetto has also edited a volume titled *Foreign Trends in American Gardens: A History of Exchange, Adaptation and Reception*, which is due to be published in 2016 by the University of Virginia Press, and is currently working on a book manuscript that examines the gardens and productive grounds of Andrea Palladio's villas in Renaissance Veneto and their reception in the similarly productive and Neo-Palladian contexts of 17th- and 18th-century England and colonial America.



NOEL KINGSBURY (UK)

Freelance Garden and Planting Design, United Kingdom

Noel Kingsbury is an English researcher, writer and teacher. A gardener since childhood, he has run a nursery, designed gardens and public spaces and done doctoral research at the University of Sheffield's Department of Landscape on competition amongst ornamental perennials. He is best known for his promotion of naturalistic planting design, but is passionate about any kind of innovation in the garden or the wider landscape. He is particularly interested in improving teaching in horticulture, and building global links between colleagues. He has also written more than 20 books on garden and landscape matters, including four with leading designer Piet Oudolf, as well as the only history of plant breeding. He lives and gardens in the Welsh Borders near Hay-on-Wye. www.noelkingsbury.com



JÖRG REKITKE (AUS)

Assoc. Prof. at National University of Singapore

Jörg Rekitke is a skilled nursery gardener. He studied landscape architecture at the Technical University Berlin and Ecole Nationale Supérieure du Paysage Versailles and received his doctorate from RWTH Aachen University. He worked as a landscape architect in Berlin and Cologne and was cofounder and art director of Lenné3D GmbH. Recently, he has been appointed to Professor and Deputy Dean, Landscape Architecture, at the School of Architecture and Design, RMIT University, Melbourne. From 2009 to 2016, he was Associate Professor in the Master of Landscape Architecture Programme, National University of Singapore. He has also held positions at RWTH Aachen University and University of Wageningen.



MATTHIAS STREMLow (CH)

Federal Office for the Environment FOEN, Rural Areas Section, Bern/Switzerland

Matthias StremLOW is head of unit at the Swiss Federal Office for the Environment / Federal Department of the Environment, Transport, Energy and Communications DETEC. He is responsible of shaping Swiss landscape politics including the strategy for parks of national importance and UNESCO world heritage sites. Since many years, StremLOW is refining the landscape strategy of Switzerland encouraging interdisciplinary and interdepartmental exchange and cooperation. Amongst many other projects, he co-initiated the landscape observation programme LABES that documents and assesses the state and development of the Swiss landscape with a range of indicators (including landscape fragmentation or light emissions). He conducted the research synthesis on "Processes of Landscape Perception" which was part of the National Research Programme "Landscapes and Habitats of the Alps" (NFP 48) launched by the Swiss National Science Foundation in 2002. StremLOW holds a PhD in German Language and Literature Studies and a Master in Literature and Environmental Sciences from the University of Zurich. His doctoral thesis investigated the perception of the Alps. Matthias StremLOW has published extensively on the topics of landscape perception, the vision for a new landscape politics, the question of how to describe landscapes as well as on issues of tourism and sustainable development.

Work-Life

CHRIS REED, UNITED STATES OF AMERICA

In an era of climate change, rapid urbanization, social inequities, and cultural debate, landscape offers a profound and functional and inventive starting point for re-thinking the ways we live. New forms of interdisciplinary, collaborative, entrepreneurial, and research-based practices might better address the complexity of issues confronting contemporary society – and might offer a more expansive view of and for landscape architecture and landscape urbanism. In this way, new practices might be understood to address broader topics or issues, to experiment with recurring concepts over multiple projects. Or they might at least start work with broader questions for exploration, to re-define the scope and scale of the projects and possibilities yet to be defined (rather than simply attempting to find solutions to already-stated problems or briefs).

Stoss is formulated in just this mode – a practice generated from ideas and centered on design, and a hybrid studio informed and cross-pollinated by research, experimentation, and teaching. Among the many concepts or starting points inherent in our own work, the following four offer insights into the ways in which we might use contemporary ideas and techniques borrowed from or in collaboration with other disciplines, and contemporary tools and approaches to real-world issues that better address the complexities and challenges at hand.

Flux (flows, oscillations, being in a state of continuous change): an idea is derived from complex adaptive systems ecology, in which the world and its ecosystems are dynamic, constantly shifting, adapting and evolving to environmental and human-influenced conditions.

Generative Processes (relational and associative techniques): design that is neither static nor compositional, but dynamic; assemblies of forms and components generated from a set of logics that can adapt themselves to circumstances or changes as projects are conceived and deployed.

Weak Systems (fields, loose assemblies, light structures, emergent patterns, weak organizational structures): intensities, gradients, energies, and atmospheres – a loose co-mingling of forces that allow things to bubble to the surface, sometimes if only momentarily; tactics are employed here opportunistically.

Dynamic Frames: scaffolds that bring to light conditions or change; or that establish loose frames that can instigate appropriation, growth, and change; or simply dynamic and multi-functional infrastructures – able to adapt to ongoing physical, environmental, social, political, and economic change over time.

At the core of all this is a dogged interest in the various ways multivariate landscapes – living, breathing, operative – might play a more formative role in the re-imagining and re-making of cities, public spaces, civic infrastructures, and metropolitan regions.



FIGURE 1. Trinity Riverfront, Dallas, Texas, USA: a landscape-based urbanism proposal to transform the 20th-century city. Stoss with SHoP et al. © Stoss.



Stoss, HyperDensityHyperLandscape, Dallas TX

FIGURE 2. Trinity Riverfront, Dallas, Texas, USA: a transformed stormwater and flood control system that brings new ecological, social, and economic life to a largely abandoned stretch of riverfront. Stoss with SHoP et al. © Stoss.



FIGURE 3. 11th Street Bridge-Park, Washington, DC, USA: a hybrid landscape infrastructure that unites two disconnected pieces of urban fabric, to each other and to the Anacostia River. Stoss with Howeler+Yoon et al. © Stoss.

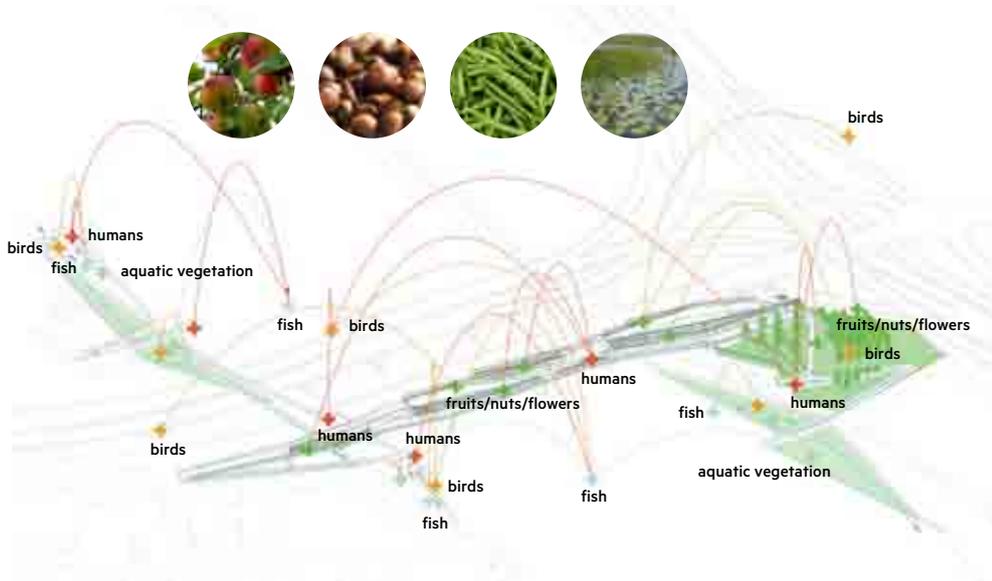


FIGURE 4. 11th Street Bridge-Park, Washington, DC, USA: the bridge cultivates new ecologies and new food chains – for people, for fish, and for birds. Stoss with Howeler+Yoon et al. © Stoss.



FIGURE 5. Harbour Square Park, Toronto, Ontario, Canada: a proposal that plays off environmental phenomena, atmospheres, and technology to create to new public experiences along the lakefront. Stoss with nArchitects et al. © Stoss.

Bridging the Alps

PAOLO L. BÜRGI, SWITZERLAND

One of the aspects of our profession is that it is bound to open spaces. Open spaces are an asset that can be taken advantage of by a single person or a group of persons but sometimes even by the entire community.

In the latter case, it concerns projects that have the power to significantly enhance the quality of the experience a person can have being in a certain place. This does not happen by designing a single object and its immediate surroundings, but rather taking into account an overall view of the space that is between things, of the perception and thoughts of who moves through it, or of who even just perceives it from a distance.

A landscape-project deeply affects the everyday life of a place; consequently, it becomes a possible stimulus for the future generations that will live it.

In Switzerland, there is a certain awareness of the role and importance of the landscape project in private, public and urban domains in competitions and study mandates. This is achieved thanks to an attention directed to the specificity of the discipline and to the necessity of safeguarding the quality of the landscape through adequate investments of money and time. These investments follow the long-term aim of respecting a vision of evolution and development of the landscape intervention, which remains different from the one of a building.

Nevertheless, this is true only in a part of Switzerland, generally the one “Beyond the Gotthard”.

Very often, in the Italian speaking Canton, the landscape architect is relegated to a sort of complementary architect, secondary in regard to an architect or an engineer, who often receive the mandate to plan the open spaces.

This behaviour inevitably gives to the landscape project a marginal role in the construction goals; it excludes all possibilities of intervention in the designing of buildings, the single accessory objects, the amelioration of details, traffic and viability management and so on.

The landscape architect is lastly consulted to determine the plantations, to assign a name to plants, or to sign a report that legitimates the interventions in the territory, sometimes flanked by a professional figure, the ecologist, paradoxically different from the landscape architect itself.

The activities of landscape architecture in Ticino are conducted against this vision, through the difficult balance between a strong professionalism, which refuses compromises that lower the quality of the project, and the sensitivity of research. A constant and careful smoothing between these two important aspects is necessary, tracing a sign addressed to beauty and to a depth of significance of the landscape.



FIGURE 1. GEOLOGICAL OBSERVATORY, CARDADA photo J M Landecy
High above in Cimetta-Cardada, on the geological observatory, a dialogue is established with the horizon that invites the visitor to approach the hidden dimensions of geological times. Past and present perspectives are interacting from this top view.



FIGURE 2. ESPACE AUGUST PICCARD photo Studio Bürgi
The crossing of a new motorway in this landscape offered the chance to redesign a place, to rediscover it with the language of the essential. The two enclosed tunnels 'reappear' in a sculptural space, a place for meetings and confrontations with our time, recreation, exhibitions, festivals or just a place to reflect, or for a moment of desired solitude.



FIGURE 3. BAMBOOPATH photo Studio Bürgi

Bridging the Gaps

RAFFAELLA FABIANI GIANNETTO, UNITED STATES OF AMERICA

The theme of the 2016 ECLAS conference calls attention to the diversity of Switzerland's cultural and linguistic heritage and points to a desire to "bridge the gap," perhaps in search of a common identity. This is not an easy task because the country's cultural and linguistic identities correspond to ethnic and civic entities that have traditionally been proud of their autonomy. The communes' willingness to champion their independence, for example, is as typically Swiss as is good chocolate. Yet, there are signs that perhaps times are ready for a constructive dialogue to take place across what has been called "a wall of words to which people [have] turned their backs" (*Switzerland: An Urban Portrait*, p. 260), and the discipline and practice of landscape architecture have the potential to make a significant contribution. This new propensity for solidarity has been strengthened by the acceleration of the pace of life, work, communication through digital media and travel that have rendered the existence of cultural and national borders obsolete.

Cross-disciplinary studies by architects and geographers have been published recently that have exposed different kinds of unacknowledged borders, however, those made by urbanization processes that have had an effect on both thriving and derelict parts of the country, from densely populated metropolitan areas to isolated mountain valleys. These studies have challenged the uniform development supported by the static essence of Swiss federalism and have instead encouraged exchanges and collaborations that would produce planning policies as varied as are the needs of different zones taken into consideration. While this proposed approach may be novel for architectural designers and planners, however, it is intrinsic to the practice of the landscape architect, as Paolo Bürgi's own words in this proceedings suggest. The work of the landscape architect is always site specific (or at least it should be), regardless of the scale of intervention and as another Swiss practitioner, Günther Vogt, has stressed in his teaching and practice, by crossing the academic boundaries of anthropology and sociology in addition to ecology and geology, to name but a few disciplines that are relevant to our practice, landscape architecture is not only site specific, but also necessarily multidisciplinary. Yet, despite this potential, Bürgi laments the marginal role the landscape architect plays in Switzerland, when compared to the responsibilities entrusted to engineers and architects. The fact that the lack of understanding and collaboration between professionals was already denounced by Dieter Kienast in 1997 indicates that very little has changed in a relatively long time span, at least in the Italian speaking Swiss canton. Bürgi, however, has worked on both sides of the Gotthard and has teaching appointments at two prestigious Italian universities and across the Atlantic at the University of Pennsylvania, where in recent years the very boundaries of landscape architecture have been reinvented to include aspects of urbanism.

Bürgi's work and pedagogical experience, as this keynote dialogue will show, illustrate how it is possible to bridge many gaps, not only between local cultural and linguistic differences but also across international borders. This dialogue will also address the opportunity of landscape architecture schools in Switzerland to train students in interdisciplinary environments, respectful of scholarly diversity and differences, in an atmosphere of collaboration that may help reduce the gap between local cultures and languages and in so doing opening up the potential for the construction of more robust bridges across international waters.

The Rabbit's Eye View

Understanding and Communicating Issues of Long-Term Plant Performance in Designed Landscapes

NOEL KINGSBURY, UNITED KINGDOM

Abstract

The long-term performance of ornamental herbaceous perennials (longevity, growth rate, seeding rate, rate of spread and competitiveness) is poorly understood and little researched, and yet is of fundamental importance given the increasingly wide use of these plants in designed landscapes, especially in low-maintenance naturalistic ones. Building on a number of studies, including a 'citizen-science' survey, a methodology for assessing and predicting long-term plant performance has been developed. This has been developed into an educational event (a day-long workshop) which has proved very successful across a wide range of user groups (amateurs, garden designers, landscape architects, landscape managers, horticulture professionals) in several different countries (including UK, USA, Russia, Ukraine, Czech Republic). The teaching methodology will be outlined and further possibilities for research and development discussed.

Background

Herbaceous perennials have long been popular in gardens and are increasingly being used in larger, often public, projects as part of a recognition of the different visual impacts they create at different times of year, as well as part of a trend towards more naturalistic planting, e.g. Mischpflanzungen (Heinrich & Messer, 2012). Stauden)and Integrierte Pflanzensystem.

The use of perennials however presents a problem in that they vary considerably in their long-term performance. This is a particular issue for those in the landscape profession who are using them in public projects or for garden designers developing large private developments; anyone using them in situations where ongoing maintenance is going to be low-level, such as for local government clients, will be particularly concerned that long-term satisfaction is achieved.

Long-term performance is understood as including longevity, rate and pattern of vegetative spread, and rate of seeding. These factors are fundamentally genetically controlled, although environmental factors may play a part in the intensity of each, particularly so with seeding.

The negative impacts of aspects of these is summarised here:

- Short lifespan Need for replacement, continuing costs
- Slow rate of vegetative spread Possibility of suppression by neighbouring plants
- High rate of vegetation spread Tendency to suppress neighbouring plants
- High rate of seeding Tendency to spread both within the planting and outside it

Reference books used by horticulture and landscape professionals pay relatively little attention to these long-term performance issues. References may be made to being 'short-lived' but indications of how short-lived are almost never given. Likewise, references may be made to plant spreading tendencies, but little quantification. The almost total absence of any research into perennial longevity is especially noted; an exception being work done at Sichtungsgarten Weihestephan (Hansen & Stahl, 1993).

Researching the long-term performance of perennials

Work undertaken in a doctoral thesis on issues favouring competition and survival amongst ornamental perennials (Kingsbury 2008) identified a number of factors, such as morphological and phenological plasticity and efficient nutrient cycling. A study funded by an EU scheme (Kingsbury 2012) took a broader view of issues which affect long-term performance, and using a citizen science approach, seeking data from practitioners (amateur and professional), using a questionnaire gathered material on the issues identified above as being key to long-term performance, together with rate of establishment.

These two studies suggested that, for the purposes of gaining a better understanding of how perennials grow and perform over time, there are a number of broad categories. However since none of these categories can be clearly demarcated, long-term performance might be best understood as being described by a series of gradients:

1) Longevity – from annuals, through to continually vegetatively-spreading perennials.

A key, and relatively clear, distinction here is between clonal and non-clonal species. In particular there is a definite group of essentially non-clonal short-lived species, which are not covered by any of the existing terminology of 'annual, biennial and perennial' (Griffiths 1992). Understanding that this group exists, and includes several species and genera which are important commercially, is of clear importance to horticulture and landscape practitioners.

A related gradient concerns that from annuals to slow-growing perennials with long lifespans; the latter often taking several years to establish, but then showing high rates of resilience once established.



FIGURE 1. *Knautia macedonica* is one of many short-lived perennials, with a tap root and shoots which do not, or only very weakly, root, and which are so tightly integrated that there is minimal prospect of them vegetatively propagating the plant. The species can therefore be regarded as non-clonal.

2) Morphology of vegetative spread – from non-clonal to rapid guerrilla spread.

Perennials commonly used in ornamental horticulture exhibit many of the different clonal strategies discussed by Klimes et al. 1997. The phalanx-guerrilla morphologies (Crawley 1997) offer a useful gradient for practitioners wanting to understand different patterns and rates of spread.

3) Persistence and integration of ramets – from highly integrated with long ramet life to loosely integrated with low ramet lifespan (Bazzaz 1990).

Long-term performance may be considerably impacted by a plant's positioning on this gradient, and in the case of species with short-lived ramets, there may be important implications for longevity. 'Persistence' as a key variable is introduced in Kingsbury and Oudolf 2013.

Addressing long-term performance in horticultural pedagogy

Given that long-term plant performance is so crucial for the work of horticulture and landscape practitioners there is an obvious interest in developing a teaching methodology which addresses it. The author has tried to address the lacuna of information in reference sources by developing a methodology which encourages professionals (and others) involved in using or managing perennials to make their own assessments of their long-term performance. Observations of plant morphology and to a lesser extent, phenology, are used as a basis for making outline predictions. These observations focus on the soil surface, at the zone where foliage meets the root system. The focus on this area has led to the term 'Rabbit's Eye View' being used for marketing purposes.



FIGURE 2. *Lysimachia ciliata* 'Firecracker' is a garden and landscape ornamental grown for its distinctive bronze foliage in spring and early summer. It has a guerrilla habit of vegetative spread. This makes some gardeners nervous, but realistically the plant is only able to establish itself in the gaps between other plants. Its habit can be seen as contributing spontaneity to the aesthetic of planting.

Through a number of institutions, businesses, or informal groupings, the latter usually organised by garden design professionals, a workshop is advertised, for a maximum of 20 people, usually run over a day with 4 to 6 hours contact time. The location and season play a major role in determining how the workshop is run.

Time of year	Location	Material used	Advantages	Disadvantages
Winter	nursery or other non-garden	roots (1)	root structure clearly visible	top-growth absent or poor
	nursery or other non-garden	container-grown plants	very realistic in terms of material students likely to have access to	top-growth absent or poor
Spring	garden (2)	plants in ground	rate and pattern of spread most readily appreciated as new shoots unobscured by growth	top-growth absent or poor
	nursery or other non-garden	container-grown plants	very realistic in terms of material students likely to have access to	top-growth undeveloped
Summer to early autumn	garden (2)	plants in ground	full extent of top-growth can be appreciated	ground-level growth patterns obscured

(1) plants dug up with the soil power-washed off the roots, so the root structure can be clearly seen
 (2): botanical, public display, educational or well-stocked private gardens

TABLE 1.

Table 1. Illustrates the various different possibilities for location and the nature of plant material that can be used, which need to be discussed with the organiser at the planning stage. The ideal situation is a garden with a wide range of perennial species, but this is not always available, or in the case of winter weather, perennials may be dormant.

The event usually begins with a 'thought experiment' – students are asked to image a 100m² plot of bare soil, and think about what will grow there spontaneously during the first summer, then the second, the third and then fifth, tenth, twentieth and hundredth years. This is a way of exploring the concept of succession, which introduces students to notions of different plant longevity, plant competition, the concept of pioneer plants and of climax vegetation (however circumscribed by current ecological thinking). Analogies between stages in succession and genres of designed planting are also elicited. This exercise is also an opportunity to assess student knowledge and experience.

The second part of the day is usually a presentation ('Ecology for Gardeners') which introduces the concept of Competitor/Stress-tolerant/Ruderal (CSR) theory (Grime 2001) in terms which draws upon familiar garden plants and environments, as well as upon the experiences practitioners may have with local natural and semi-natural habitats. The presentation discusses some broad categories of perennial lifecycle and aspects of morphology and phenology, using commonly-available plant species: short-lived and long-lived perennials, guerrilla and phalanx spread, persistence and ramet longevity, long-lived but slow-to-establish species, and the growth patterns of grasses (a gradient from turf-forming to cespitose).

The rest of the day is spent looking at living plant material. In a garden, students are organised into small groups and asked to go out and look for particular examples of the various categories or aspects outlined above, and then summoned back to a plenary where finds are discussed. In a nursery or other situations where living plants are not available, containerised plants are used; whilst there are obvious disadvantages compared to seeing the plants growing in the ground, there is an advantage in that many garden design practitioners are very familiar with containerised plants, but also that in many cases unfamiliar plants are first encountered this way.

The day usually ends with a tour around the garden with particular plants being



FIGURE 3. Nurseries with containerised plants offer the opportunity to appreciate root growth much more easily than plants in the ground, and with a large range of plants, although development may often be immature. Courtesy of Seminar-Eco-Landscape, and Agricultural University of Moscow.



FIGURE 4. Specimens with washed roots enable the entire plant to be appreciated, and are very transportable. This is particularly useful in teaching situations in winter or where there is little access to plants. Credit: Dept. of Landscape, University of Sheffield.

pointed out and discussed. The teaching style throughout is based on eliciting as much material from students as possible, teacher-derived information only being supplied when student input has dried up. The use of washed roots, usually done in the winter, as a substitute for the living plants of the garden, allows this exercise to be done indoors – and has the advantage that many students express their particular interest in seeing parts of plants normally hidden.

The workshop has been carried out in the UK, USA, Argentina, Uruguay, Czech Republic, Sweden, Austria, Russia and Ukraine. Interpreters have been used where necessary, which works well so long as scientific names are understood by the interpreter. The ability of the workshop to address the interests of several different groups simultaneously: amateurs, horticulture professionals, garden and landscape designers, is a particular part of its success. Future refinements will need to address different climate zones, and a consequent different suite of plant characteristics.

References

- Bazzaz, F.A. (1990) 'Successional Environments: Plant-Plant Interactions'. In Grace, J.B. and Tilman, D. (eds.), *Perspectives on Plant Competition* pp.239-263. Academic Press, San Diego.
- Crawley, M.J. (1997) 'Life History and Environment'. In Crawley, M.J. (ed.) *Plant Ecology*, pp.239-261. Oxford, Blackwell.
- Griffiths, M. (1992) *The Royal Horticultural Society Index of Garden Plants*. London: Macmillan.
- Grime, J.P. (2001) *Plant Strategies, Vegetation Processes and Ecosystem Properties*. Chichester, UK: John Wiley.
- Hansen, R., & Stahl, F. (1993). *Perennials and their garden habitats*. Portland, OR: Timber Press.
- Heinrich, A., & Messer, U. J. (2012). *Stauden-mischpflanzungen: Praxis, Beispiele, Tendenzen*. Stuttgart: Ulmer.
- Kingsbury, N. J. (2008). *An investigation into the performance of species in ecologically based ornamental herbaceous vegetation, with particular reference to competition in productive environments*. Unpublished doctoral thesis, University of Sheffield.
- Kingsbury, N. (2012). *Evaluating the long-term performance of ornamental herbaceous plants using a questionnaire-based practitioner survey, for Interreg IVb Making Places Profitable – Public and Private open spaces (MP4) (2007-2013)*. Available at: www.scribd.com/doc/44246045/Long-term-performance-of-ornamental-perennials
- Oudolf, P., & Kingsbury, N. (2013). *Planting: A new perspective*. Portland, OR: Timber Press.
- Klimes, L., Klimesova, J., Hendriks R., & van Groenendael J. (1997). 'Clonal plant architecture: a comparative analysis of form and function', in *The Ecology and Evolution of Clonal Plants*, (Eds. de Kroon, H. & van Groenendael, J.), Backhuys, Leiden.

Gimme Shelter

JÖRG REKITTKE, AUSTRALIA

"F<beep> the Park!," a Dutch colleague said, somewhere back in the Eighties, before he became famous and his office began to build all those parks. Apart from the inevitable professional opportunism, his historical outcry is even more topical than ever. If we study The Economist Intelligence Unit's order of things – the list of the World's Most Liveable Cities – we can be sure that the correspondent image material for those emerging victorious will show a nice park, or waterfront, in the foreground and a generic CBD skyline in the background. More tantalizing for the designer is the bottom of such a ranking, showing the allegedly least liveable cities in the world – most likely a recipe of stereotypical image ingredients, illustrating the unfortunate underdogs and probably including a dash of a terribly overstrained public transport system, a couple of down-and-out panhandlers, with an added pinch of some other urban deficiency and, last but not least, a topping of war.

For the young, wild, and free student of landscape architecture, there is more to grapple with in this world than the design of the next waterfront promenade or fancy park, dedicated to the well-to-do caffè latte urbanite. The lion's share of the current global urbanization surge does not necessarily look and feel like Zurich, or Copenhagen, or Singapore. Instead, it feels like the abrasiveness of the genuine megacities, agglomerations, and hinterland of the so-called developing or emerging countries – for details, please consult the list of the least ... well, you know what I mean. Armies of dauntless designers and researchers, armed with skills, methods, and technology, are needed in these places, where they have to try to effect something that might be categorized as ecological, sustainable, or resilient – next, please! More comparable to an environmental combat zone than a comfortable playground for the landscape designer, this intrinsically urban cosmos is not exotic or inaccessible. It is just a stone's throw away from our comfort zone and anyone can easily go there. Very probably, the challenges on-site are intractable but we may not desist from meddling with the wresting of the local urban landscape leavings from perfect obliteration. This sounds more miserable than intended. In the course of our work, we do experience genuine beauty, fascination, and inspiration, not infrequently falling in love with the maligned places. We don't come as helpers, we just operate as trained designers and we simply search for the problems that should be tackled by trained designers. Our work anthem has been written by rock 'n rollers Keith Richards and Mick Jagger who characterized some of the forces out there in a timeless way:

"Oh, a storm is threat'ning / My very life today / If I don't get some shelter / Oh yeah, I'm gonna fade away // War, children, it's just a shot away / It's just a shot away / War, children, it's just a shot away / It's just a shot away // Ooh, see the fire is sweepin' / Our very street today / Burns like a red coal carpet / Mad bull lost it's way // War, children, it's just a shot away. It's just a shot away / War, children, it's just a shot away / It's just a shot away // Rape, murder! It's just a shot away / It's just a shot away // Rape, murder! / It's just a shot away / It's just a shot away // Rape, murder! / It's just a shot away / It's just a shot away // The floods is threat'ning / My very life today / Gimme, gimme shelter / Or I'm gonna fade away // War, children, it's just a shot away / I tell you love, sister, it's just a kiss away / Kiss away, kiss away"

– “Gimme Shelter”, Rolling Stones 1969.



FIGURE 1. Washing and drying of recyclable plastic foil, along the water's edge of the Buriganga River, near the historic centre of Dhaka, Bangladesh. The river is ultra-polluted, and Dhaka is ranking 139th, of a total of 140, on the Economist Intelligence Unit's list of the World's Most Livable Cities (2015). © Jörg Rekittke



FIGURE 2. Waterfront housing in Dhaka, Bangladesh, deemed to be one of the least livable cities of the world. For the designer, in such a place, there might be a bit more to tackle than in Hamburg Hafenstadt, or along the riverfront of Melbourne – ranking first on the Economist Intelligence Unit’s list of the World’s Most Livable Cities (2015). © Jörg Rekitke



FIGURE 3. Damascus, ranked last on the Economist Intelligence Unit’s list of the World’s Most Livable Cities (2015). The photo shows the Dscharmana city quarter, after a bomb attack. © Omar Sanadiki/Reuters

Swiss Made – From Cultural Landscape to Landscape Culture

MATTHIAS STREMLow, SWITZERLAND

Switzerland defines itself very much through its landscapes. They are part of the DNA of this country at the heart of Europe: the imposing mountains, scenic lakes and high-quality farmland are as integral to Switzerland's identity as its reputation for first-class universities, the fact that it is one of the world's most important financial centres and its long tradition in the area of craftsmanship. This is what Switzerland stands for abroad. The Swiss landscape as a whole is a reflection of these national identity markers – each one of them is a hit on the export market as is the Swiss landscape itself.

We are experiencing the turn of an era today, in which global issues have an impact on local conditions. The most hotly debated of these issues at present include climate change, migration flows, and the global distribution of water and food. It is increasingly clear that these global challenges can be reduced to the following simple questions: How do we want to live now and how can we live in the future? Do we have to change our way of life?

In terms of landscape quality the current turn of an era is expressed in the fact that landscape is under more pressure today than it ever was before. The development of each individual landscape is a complex matter: a landscape is both an image and space. It always mirrors the practices of the people who live in it. Landscape is ultimately the product of the different uses made of it. It is in our hands to decide whether landscape is a coincidental by-product or the main product of a society's spatial action.

Over the last century, the potential value created by a landscape has moved further away from the landscape space itself than ever before. When we look back at the history of landscape development, we see that the cultural landscapes we value so much today arose from existential need: favourable places were chosen as settlement locations, places that offered the best possible shelter from the wind and weather, that were within easy reach of fertile land. Buildings were constructed using materials that could be obtained locally and did not have to be transported over long distances like wood, clay and typical regional stone. Farming practices were adapted to the natural conditions and perfected. Through an existential dependence on natural conditions, landscapes were formed which we see as 'beautiful' today because human artefacts and natural features have melded to form a cohesive whole. It is important to note that the beauty of nature as landscape only become obvious to humans through their interventions in terms of accessing and shaping these stretches of land.

With the advent of industrialisation and development of a society based on the division of labour, this close intertwining of man and space gradually unravelled. Given the high price to be paid for the old way of life – the hardship involved in manual work and an everyday way of life that was severely hampered by economic and natural conditions – going back is not an option for the future. In social terms and in terms of its comfortable lifestyle, modern Switzerland is a success story. However, this pleasant

modern life and the integration of Switzerland into a globalised economic space since the late twentieth century have left profound traces on the landscape. The much-cited ‘hotchpotch of settlements’ or Siedlungsbrei of the Swiss Central Plateau is just one reflection of this development: today, irrespective of the prevailing natural spatial conditions, almost everything is ‘doable’. There is no location-specific link bridging the logic of production and consumption any more. Because landscapes always reflect the lifestyle of the people who live in and affect them, today, our different landscapes follow the logic of a global world. On the one hand, they are relinquishing their typical regional qualities while, on the other hand, their function as a source of spatial identity in human perception is becoming more important. This reveals a paradox between location-related value creation and landscape-related appreciation. So this poses a huge challenge for landscape policy: if we want to change a landscape we have to change our way of life. If we want to conserve the valuable remnants of the cultural landscapes that were shaped by the interdependencies of man and nature, we need to reflect on our future way of life and economic system.

My lecture “From Cultural Landscape to Landscape Culture” suggests two things: it is about changing a way of life, which is something that can only happen out of society itself, and it is about tackling imminent landscape change and monitoring and controlling it through political and governmental responsibility. As a basic formula for attaining these objectives, I see the need to adopt a landscape-based approach in general and to make economic, social and aesthetic decisions from a landscape-based perspective.

My unit of the Swiss Confederation’s Federal Office for the Environment (FOEN) supports federal landscape policy. Landscape policy must meet the challenge of landscape change. In addition to the issue of landscape conservation, the design and creation of landscape qualities are particularly important. What is involved is a landscape culture based on the careful use and management of existing and future qualities. The FOEN’s Landscape Strategy with its three strategic thrusts aims to achieve this for Switzerland (Figure 1):

- Call for coherent landscape policy for the entire national territory.
- Promote particularly valuable landscapes.
- Design federal activities in a way that is compatible with the landscape.

Articles 1 and 3 of the Federal Act on the Protection of Nature and Cultural Heritage authorises the Swiss Confederation to address all landscapes in the entire territory of Switzerland and not only landscapes that are particularly worthy of protection due to natural conditions.

Operational implementation of the FOEN's Landscape Strategy

<p>Call for coherent landscape policy</p> <p>Swiss Landscape Concept</p> <ul style="list-style-type: none"> - Update <p>Landscape policy</p> <ul style="list-style-type: none"> - Canton/confederation cooperation - Publicationen <p>New financial equalisation (NFA)</p> <ul style="list-style-type: none"> - Landscape programme <p>Landscape monitoring Switzerland (LABES)</p> <ul style="list-style-type: none"> - Updating of indicators - Reporting 	<p>Promote particularly valuable landscapes</p> <p>Mire landscapes</p> <ul style="list-style-type: none"> - Implementation support <p>Federal Inventory of Landscapes of National Importance (BLN)</p> <ul style="list-style-type: none"> - Complete revision BLN <p>Parks policy</p> <ul style="list-style-type: none"> - Strategic management <p>UNESCO World Heritage</p> <ul style="list-style-type: none"> - Implementation at national level 	<p>Design federal activities in a way that is compatible with the landscape</p> <p>Landscape quality in the sectoral policies</p> <ul style="list-style-type: none"> -Assessment of concrete projects (federal tasks) -Assessment of structure plans -Participation in law-making -Participation in sectoral planning -Landscape quality projects -Spatial development model projects <p>FOEN Strategy Rural areas</p> <ul style="list-style-type: none"> -Pilot project "Landscape as a basis for sustainable regional development"
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FIGURE 1. The three strategic thrusts of the FOEN's Landscape Strategy and its operational implementation.
© Federal Office of the Environment, FOEN

An important management instrument for fulfilling the first objective of the landscape strategy is the updating of the Swiss Landscape Concept (LKS). It is a powerful instrument because all of the federal authorities must comply with its instructions and their sectoral policies must be based on it. The Swiss Landscape Concept of 1997 was developed on the basis of a sectoral policy logic. The updated landscape concept will be more strongly based on the real landscape space and will demonstrate the impacts that sectoral policies have on concrete landscape qualities. The aim is to alleviate the current development whereby landscape is fragmented into more and more individual parts and is not understood as an integrated action space.

Regarding the aim of promoting particularly valuable landscapes, the Parks of national importance dossier has been very dynamic and successful over the last decade. As part of the parks policy, in addition to the Swiss National Park, which has existed since 1914, nineteen new parks of national importance have been or are in the process of being established throughout Switzerland since 2007. They are laboratories for the development of a landscape culture, in which bottom-up and top-down processes are intertwined: based on a Charter, the individual park communes undertake to develop these rural spaces both economically and socially in accordance with the principles of sustainability. The federal authorities provide around 17 million euro annually for the promotion of these activities through the system of national financial equalisation. The federal funding provided for each park must be matched by cantonal and third-party contributions. This gives the regions the necessary power to implement sustainable development in accordance with its high standards for nature and the landscape.

In addition to the parks, Switzerland has eleven UNESCO world heritage sites in which, needless to say, the landscape always plays a prominent role. My unit directly manages three of them as World Natural Heritage Sites and around one million euro is provided for them annually. Together with the parks, mires and other landscapes listed in the Federal Inventory of Landscapes of National Importance (BLN), these landscapes of high value cover more than a third of the territory of Switzerland (Figure 2). They are directly influenced by the political conditions defined by the Confederation. To these are added the agricultural landscapes: around 55.5 million euro is provided for their conservation and improvement through Landscape Quality Projects, which are also an important component of the landscape policy. This has a crucial impact on the shape of the landscape throughout the entire country.

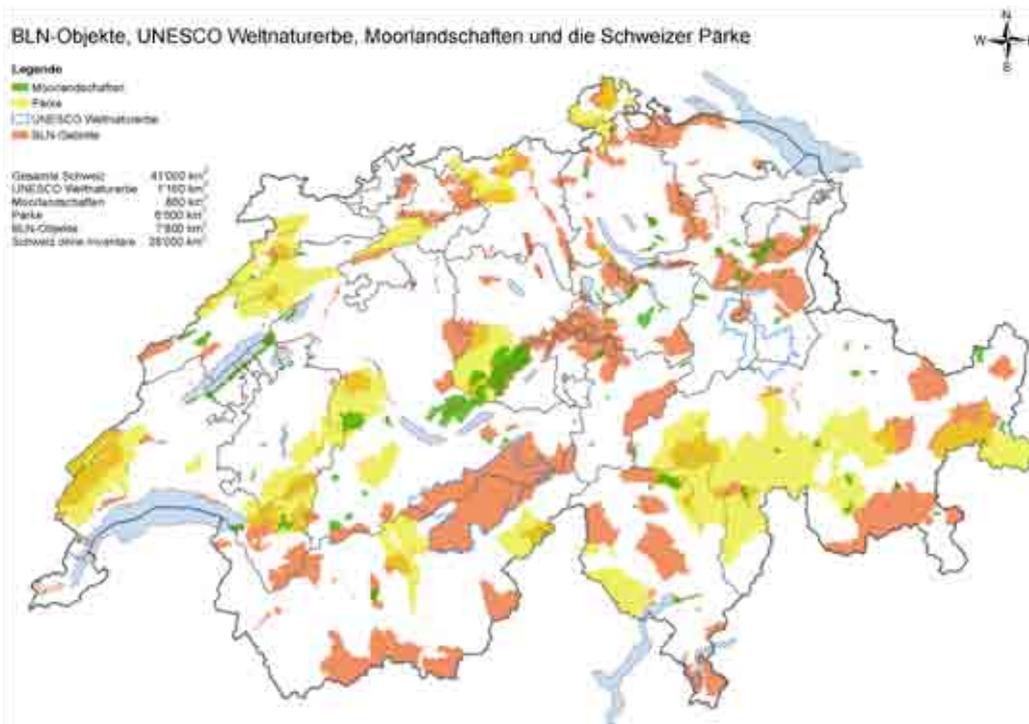


FIGURE 2. Map of Switzerland showing the Landscapes of National Importance (BLN), the UNESCO World Heritage Sites, as well as the Mires and Parks of national Importance. Together, they cover more than a third of the Swiss territory. © Federal Office of the Environment, FOEN

Switzerland is a small country, but thanks to its geopolitical situation and functioning state system it is in a position to embark on pioneering paths. The underlying thesis of my lecture “From Cultural Landscape to Landscape Culture” is that, unlike other European countries, Switzerland can manage its landscape development in the context of the current process of change. First, it has the necessary capacities and institutions in terms of governance; second, there is a political will to do it; third, the expert skills necessary to manage landscape change and actively shape the landscape at all scales are available in the research institutes and among the population; and, fourth, Switzerland has the necessary financial resources.

The “construction project of the century” the new Gotthard Base Tunnel, which opened on 1 June 2016, is an impressive example of a new infrastructure project, in which consideration was also given to the design of the landscape. At 57 kilometres in length, it is the longest railway tunnel in the world and is covered by 2,500 metres

of rock. The design of the new AlpTransit and the excavation of the 36 million tonnes of stone for the tunnel was accompanied from the outset by a Design Consultancy Group. This group included architects, engineers and urban planners. Landscape architects were commissioned to produce a landscape design in the region for the excavation material from the Gotthard Tunnel - the mass of rock involved would fill a 330-metre cube. What arose is an infrastructure landscape that follows an aesthetic and ecological strategy (Figures 3-5) and takes plants, animals and humans into account on an equal footing. Such projects represent a step in the right direction when it comes to the development of a landscape culture on a large and medium scale in the context of landscape planning.



FIGURE 3.
Northern Portal of the new Gotthard tunnel in Erstfeld (UR): The granite arch symbolizes the landscape building of the old Gotthard railway, whereas the concrete tube stands for the “breakthrough of the mountain”. © Markus Frietsch



FIGURE 4.
An artificial mountain in the forested hills, mounted up of 3.5 million cubic meter rock excavation in Sigrino (TI). In accordance with the solid tradition of Swiss design there was no attempt to present something artificial as natural. The landscape design developed its forms and material use from the dialectic between the natural and artificial (design: Atelier Girot). © Markus Frietsch



FIGURE 5.
Islands in the Reuss delta (UR) constructed of excavation material from the Gotthard tunnel. Some of them protect the fragile bank, others give space to bathers or nesting birds and creates multifaceted habitats (design: Team Landschaftsprojekt Reussdelta). © Markus Frietsch

Cultural landscapes arise – one way or another. As opposed to this, a landscape culture involves a conscious decision on the part of society. Putting landscape culture into practice necessitates individual awareness – individual in that we perceive the landscape qualities around us consciously and keep ourselves informed as consumers and citizens about the influence our decisions can have on these qualities. However, awareness is also required at political level. Landscape quality is a position of strength. Developing landscapes while conserving their character is a joint task. Politics can provide the necessary conditions through the creation of a coherent landscape policy, which ensures that uses and demands are better tailored to each other and that landscapes are developed sustainably.



Full Papers



Landscape Design

LANDSCAPE DESIGN

MARIA-BEATRICE ANDREUCCI

Enhancing Heritage Landscape Performance Through Multifunctionally Designed Ecologies. Lessons from Florence (I)
65

FEDERICO ARU

Connections Among Scales in the Settlement Processes of the Sardinian Rural Landscape: The Gavoi Case.
69

DIEDRICH BRUNS, ADRI VAN DEN BRINK
HILDE TOBI, SIMON BELL

Advancing Landscape Architecture Research
73

ELISA CRISTIANA CATTANEO

Weak City. Notes on Landscape Urbanism
77

MELISSA CATE CHRIST

Inside Out: Applying Experiential Learning During the 2014 Hong Kong Protests to an Urban Environmental Design Studio Context
81

MARK EISCHEID

'Exploding to the Infinite': Dan Kileys' North Christian Church
85

RUDI VAN ETTEGER

Design Principles and Guidelines: Bridging the Gap Between Science and Design
89

ALBERT FEKETE

Layered Landscape Design
93

ORSOLYA FEKETE, KINGA SZILÁGYI

Impact of Historical Zoos on Space Structure, Function and Infrastructure of Urban Public Parks
97

HANSJÖRG GADIENT, CHRISTOPH KÜFFER,
ANDRÉ STAPFER

Bridging the Gap Between Landscape Architecture and Ecology in Teaching and Design Practice
101

ANNA IMOLA HENNING

The Changing History of Klastromrét: One of the Emblematic Sites in Baia Mare
105

WENDY HODDINOTT

Bridging the Gap Between Expertise and Engagement: an Exploration of Elegance and Design Process
109

UNA ĪLE, AIJA ZIEMEĻNIECE, DAIGA ZIGMUNDE,
NATALIJA ŅITAVSKA, MADARA MARKOVA,
KRISTĪNE VUGULE

Residential Outdoor Territory Revitalization Experience In the Cities of Latvia
113

KARSTEN JØRGENSEN

Bridging Gaps Between Landscape and Architecture in Norwegian Post-War Modernism
121

ANTONIA KOUKOUVELOU

Bridges are Landscape Infrastructure Elements – A Method for Connecting a Bridge with Landscape and Infrastructure
125

PINAR KOYLU, OGUZ YILMAZ

Design as a Learning Process Utilizing Knowledge and Building up Knowledge
129

BETTINA LAMM

From Alley to Garden: Co-Creating Spaces Through a Build-Design Process
133

FRANCESCO MARRAS

River-Machine and Machines of the River
137

CLAUDIA MOLL

The Kunstgärtner ('Artistic Gardeners') of the 19th Century – Designers or Entrepreneurs?
141

CORNELIA MÜLLER, OLE CHRIST, CHRISTIAN RÖPER,
MARTIN AUF DER LAKE

London Marsh – Part C: City of London – Peter-Joseph-Lenné-Prize-2014
145

STEFFEN NIJHUIS

GIS-Applications in Landscape Design and Research
149

PABLO PÉREZ RAMOS

Processes in Formation: Ecological Performance and Landscape Aesthetics
153

ROBERTA PISTONI

Application of Urban Metabolism Approach in Energy Landscape Design
157

MARTIN PROMINSKI

**Perspectives for Bridging the Gap Between
Landscape Design and Research**
161

INDRA PURS

Design of Air
165

JAMES A. ROYCE

**Integrating Cross-Discipline Collaboration
into Landscape Architectural Curricula**
169

KINGA RYBAK-NIEDZIÓŁKA

**Educating City Landscape Designing in
University of Life Sciences in Warsaw**
173

MAGDALENA RZESZOTARSKA-PĄŁKA, MAGDALENA
CZAŁCZYŃSKA-PODOLSKA

**Social Landscape Architecture as the
Missing Link in the Shaping of Urban Public
Spaces**
177

HENRIK SCHULTZ

**Transforming the Urban Fabric – the Case
Study of Freiburg**
181

VESELIN SHAHANOV

**Application of Experimental Method in
Landscape Design Education**
185

JOERG SIEWEKE

**Trespassing to the River to Reinstate
Individual and Public Health – Mind the Gap
Between Impaired Inner and Outer Nature**
189

CLAUDIO SIRIGU

**Weak Contexts in Evolution.
Density and Limits of the Urban Margin of
Cagliari.**
193

IVAN STANKOCI, INGRID BELČÁKOVÁ

**Different Ways of Interpretation of
Historical Gardens by Landscape
Architecture Students**
197

JULIE STEVENS, BARB TOEWS,

PATTI WACHTENDORF, AMY WAGENFELD
**Creating Well-Rounded Designers of Prison
Environments: Transdisciplinary Action
Research, Design and Teaching**
201

SAREM JAMES SUNDERLAND

**Traces in the Landscape – An Alternative
Memorial Design Practice**
205

MARTIN VAN DEN TOORN

**Islands in Landscape Architecture: Design,
Abstractions and Metaphors**
209

MARC TREIB

**Process and Product: The “Renaturalization”
of the River Aire**
215

TIM WATERMAN

**Making Meaning: Minds, Bodies and Media
in Design Education**
219

ANNA WILCZYŃSKA, EWA ZIELIŃSKA

**Interdisciplinary Approach to Common
Urban Landscape. Theory and Teaching
Practice.**
223

DANIEL WINTERBOTTOM, JULIE STEVENS,
ANDREW FOX

**Design-Build on the Frontlines: Most
Important Questions**
227

Enhancing Heritage Landscape Performance Through Multifunctionally Designed Ecologies. Lessons from Florence

MARIA-BEATRICE ANDREUCCI Sapienza University of Rome, Italy

environmental design | green infrastructure | landscape resilience |
multifunctional heritage landscapes | nature-based solutions

Peri-urban heritage landscapes currently face major threats: growing competition of non-agricultural land use, uncontrolled urbanization, abandonment of rural settlements and general intensification of anthropogenic activities which are negatively affecting these valuable and fragile ecosystems.

Over the last decade, researchers and practitioners have been acknowledging the value of the multiple benefits provided by peri-urban heritage landscapes – slow-food, fibre and building materials, rural livelihoods, well-being and natural medicine, energy and biodiversity, sustainable tourism, cultural and educational opportunities. A variety of frameworks and terms have developed to describe visions which call for the synergic integration of agricultural, environmental and cultural outcomes. Green Infrastructure, in particular, has become a scientific and practical approach to embed networks of nature-based solutions.

A project recently carried out in Florence (I) has developed a landscape design which, starting from improved biodiversity as a desirable target, and leveraging on the long established geo-historical and socio-economical dimensions of the peri-urban heritage landscape, has determined effective convergences between agricultural production (commodity outputs), natural capital protection and provision of leisure and other cultural opportunities (non-commodity outputs), in order to reduce land-use conflict, advance urbanites' quality of life and encourage long-lasting stakeholders' engagement towards stronger urban resilience.

Heritage Landscapes and the Green Infrastructure Approach

Peri-urban heritage landscapes currently face major threats: growing competition of non-agricultural land use, uncontrolled urbanization, the abandonment of rural settlements, and general intensification of anthropogenic activities which negatively affects these valuable and fragile ecosystems.

Following the CAP reforms - 1992 MacSharry CAP Reform, 2003 Common Agricultural Policy Reforms and Agenda 2000 (EU 1992; EU 2000) - and the adoption of the European Landscape Convention (2000) the general attention towards the environment and the multiple benefits provided by the primary sector in favour of cities and urbanites has been growing substantially.

There has been an increasingly convergence over the last decade, of research findings, stakeholders' resolutions and on-going implementations (Rodriguez et al. 2006; Bennett et al. 2009) that acknowledge and measure the value of the multiple benefits provided by peri-urban heritage landscapes – slow-food, fibre and building materials, rural livelihoods, well-being and natural medicine, energy and biodiversity, sustainable tourism, as well as cultural and educational opportunities.

Despite the growing interest in urban agriculture, landscape planners and designers are still ill-equipped to integrate “eco-agricultural landscapes” into complex urban and peri-urban transformation projects, which so far have been driven mainly by prevailing economic interests, and often resulting in land-use conflicts.

In parallel, a variety of frameworks and terms have developed to describe visions which call for the synergic integration of agricultural, environmental and cultural outcomes. Green Infrastructure (Benedict and McMahon 2006), in particular, has become a scientific and practical approach to embed networks of nature-based solutions “designed and managed as multifunctional resources capable of delivering...ecological



FIGURE 1. Satellite view of Florence.



FIGURE 2. *Opere legis* restrictions on the Florentine territory (DL n.41/2004 “Codice dei beni culturali e del paesaggio”).



FIGURE 3. Florentine peri-urban heritage landscape.

services and quality of life benefits...and needed to underpin sustainability” (Natural England 2008: 15).

Implementing Nature-Based Solutions in Peri-Urban Heritage Landscapes of Florence (I)

Rural areas represent 75% of the total Italian territory, and consequently, it is very important that urban and peri-urban agricultural activities are managed according to sustainable development models, aiming at preserving and valorising those multifunctional heritage landscapes.

Florence’s rural landscape structure enjoys a significant homogeneous status that traces back to medieval times, when agriculture became widespread and castles, towers and hamlets began to appear, traversed by extensive road networks and paths running alongside or intersecting streams and brooks (Corsani and Morelli 2015: 431).

A 10-hectare landscape design project in Florence has been recently (2013-2014) developed by the author, in the hilly peri-urban territory of Marignolle, located on the South-West bank of the Arno river (Figure 1).

The area, protected by law since 1951 (Figure 2), still presents

the typical structure of the centuries-old Florentine peri-urban landscape (*Piano Paesaggistico della Regione Toscana* 2013), dominated by terraced olive tree cultivations and with a large presence of linear elements (lines of trees, hedgerows), arable lands and woods (Figure 3).

The incommensurable value of this iconic cultural landscape - first illustrated by 14th century local painters and today at risk - deserves any designer’s greatest attention. Starting from a framework of peri-urban landscape transition from pure traditional agriculture to strong multifunctionality, the project has been devoted to the development of an articulated open space design, which modelled the property land according to a wide range of functions, respecting the specific protected heritage context of the site, while exploring synergies and focusing on positive externalities that could maximize the benefits for the resident family.



FIGURE 4. Sustainable planting design. Eco-agricultural park, Marignolle, Florence (I), 2014.

The terraced olive tree grove has been enriched with visual driving paths towards the city centre of Florence and the Fiesole hill, while some of the olive trees have been married with climbing roses and vines, according to the Tuscan rural traditions. The reforestation strategy has been based on extensive *Quercus pubescens* tree planting (Figure 4), in order to compensate clearing land for agricultural cultivation and to remember the local climax vegetation. Native herbaceous perennials, like *Iris germanica var. florentina*, *Achillea*, *Allium*, *Aquilegia*, *Dianthus*, *Euphorbia*, *Gaura*, *Helicrysum*, *Liriope muscari*, *Rosmarinus officinalis*, *Salvia*, *Santolina*, *Thymus*, have been planted as a sustainable, low-maintenance Mediterranean garden (Özgüner et al. 2007; Phoenix et al. 2008), created in proximity to the renovated XIX century “casa colonica” (traditional farmhouse). *Cupressus sempervirens*, *Cercis siliquastrum*, *Arbutus unedo*, *Laurus nobilis*, *Acer spp.*, together with other native shrubs and flowering plants attractive to bees and local wildlife – structured in long, irregular, natural looking hedgerows, planted as boundary lines - enhance the hundreds of species rich botanical palette. A “synergic vegetable garden”, an “antique fruit tree orchard”, and a henhouse, designed to satisfy with their productions the entire family organic food necessities, the completed programme, aimed at offering to the residents and visitors alike an ever changing outdoor physical and emotional experiences.

The Multiple Benefits of Eco-Agricultural Heritage Landscapes

The most obvious benefits of the project are related to the production of flowers, vegetables, fruits and other foods in close proximity to the consumers. By producing food locally and balancing production with consumption, the embodied energy of the food required to feed the urbanites is reduced because of lower transportation distance, less packaging and processing, and greater efficiency in the production inputs. Reusing urban waste products locally, both biodegradable wastes for compost, and waste-water (e.g., stormwater and greywater) for irrigation,

energy is also conserved. Moreover, the circumstance that the food is consumed directly by the producer, improves the food security (access to healthy and short-cycle food) for the household (Taylor Lovell 2010).

In addition to the most obvious production functions, the implemented design provides a wide range of essential ecological and environmental functions (e.g., biodiversity, nutrient cycling, soil creation, micro-climate control), as well as cultural and recreational opportunities (e.g., sports and other out-door activities, improved visual quality, health and wellness, education).

Also the intentional establishment of physical linkages and cultural connections between urban agriculture and rural agriculture provides positive outcomes beyond the limits of the city of Florence.

The main challenge has been to design peri-urban agriculture spaces to be multifunctional, matching the specific needs and preferences of local residents, while also protecting the natural environment enhancing essential ecological, economic and cultural ecosystem services.

Towards Urban Resilience Through Adaptive Landscape Design

The above described landscape design project - starting from improved biodiversity as a desirable target and leveraging on the long established geo-historical and socio-economical dimensions of the Florentine peri-urban heritage landscape - has certainly determined effective convergences between agricultural production (commodity outputs), natural capital protection and provision of leisure and other cultural opportunities (non-commodity outputs) able to reduce land-use conflicts and encourage long-lasting stakeholders' engagement towards improved urban resilience.

While the many benefits from urban Green Infrastructure are becoming more and more evident through the implementation of sustainable landscape design projects and related applied research, few are still the cases in which not only the synergies,

but also the implicit trade-offs are assessed and measured by researchers, practitioners and decision-makers, in order to maximize community's total return.

The main consequential challenge for practitioners is thus not only to develop sustainable landscape design projects, but also to contribute with their findings to the assessment of the adequacy of the tools and methods to support the valuation, the management, as well as the adaptive monitoring of such integrated multifunctional design approaches, because only then our heritage landscapes are long-term fostered and preserved.

References

- Benedict M., McMahon E., 2006. Green Infrastructure: Linking Landscapes and Communities. Island Press, Washington, DC.
- Bennett, E. M., Peterson, G. D., & Gordon, L. J. (2009). Understanding relationships among multiple ecosystem services. *Ecology letters*, 12(12), 1394-1404.
- Corsani G., Morelli E., 2015. Towards the Park of Florence Hills. In: R. Gambino and A. Peano, eds. *Nature Policies and Landscape Policies, Urban and Landscape perspectives*. Vol. 18. London: Springer, 2015, 432-437
http://ec.europa.eu/agriculture/cap-history/1992-reform/index_en.htm
http://ec.europa.eu/agriculture/cap-history/agenda-2000/index_en.htm
- Natural England, 2008. State of the Natural Environment. Natural England General Publication, Number 85.
- Özgüner H., Kendle A.D., Bisgrove R.J., 2007. Attitudes of landscape professionals towards naturalistic versus formal urban landscapes in the UK. *Landscape and Urban Planning*, 81: 34-45.
- Phoenix G.K., Johnson D., Grime J.P., Booth R.E., 2008. Sustaining ecosystem services in ancient limestone grassland: importance of major component plants and community composition. *Journal of Ecology*, 96: 894-902.
- Regione Toscana, 2013. Piano Paesaggistico Regionale della Toscana. Florence.
- Rodríguez, J. P., Beard, T. D., Bennett, E. M., Cumming, G. S., Cork, S. J., Agard, J., ... & Peterson, G. D. (2006). Trade-offs across space, time, and ecosystem services. *Ecology and society*, 11(1), 28.
- Taylor Lovell, 2010. Multifunctional Urban Agriculture for Sustainable Land Use Planning in the United States. *Sustainability*, 2: 2499-2522.

Connections Among Scales in the Settlement Processes of the Sardinian Rural Landscape: The Gavoi Case.

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rural landscape | villages | process | modification

The last seventy years have created a gap among the elements of the historical landscape and those produced by new political, economic and social dynamics and their interactions. The research examines the rural landscape part, regulated by the symbiosis between the city centre and its closest cultivated territory that ensured the subsistence of the village. The investigation focuses on two different scales: on one hand the large-scale logic, the historical/governmental processes and the consequences on the soil organization, and on the other the urban and architectural impact that these factors have. Which are the morphological, typological, functional variations that these processes cause? How does the housing change? The case study - the village of Gavoi - clarifies how these dynamics take place.

The history of the Sardinian landscape tells us a story of a strong rural settlement characterized by an economic structure based on the coexistence between the pastoral and the agricultural world. Here the predominant settlement structure is defined by a network of villages, which historically organized its rural areas in order to be potentially self-sufficient. The structure of these centralized areas were composed of a compact village, a suburban area cultivated with orchards and micro-crops, an open field area mostly cultivated with cereals, an area of pastures and an uncultivated area. The cyclical nature of the use of the ground and the dynamism of the winter transhumance from the mountains to the plains illustrate the contact between very different and distant regional areas. These micro-processes were economically and socially relevant because they allowed contacts through the exchange among mountain, hill and plain products.

From the 60s there was an increase of the food industry, linked to the processing of livestock products, such as milk, cheese, and meat. The strong historical cohesion between the founding elements of the settlement of the territory breaks its structure provoking the abandonment of fields and the re-naturalization of cultivated lands with a strong damage to the rural world, nowadays considered the main guardian of the landscape (PAC, Politiche Agrarie Comunitarie - 2009). The social structure of the region has been badly damaged because of internal migrations (from the smallest to the richest villages/cities), the crisis of internal transhumance (replaced with extensive livestock) and the migration of shepherds towards the Italian central regions. These factors have led to the lack of all those fundamental contacts among villages.

The village of Gavoi is a part of this context. It is located in the mountainous heart of the Island where the strong morphology dominates the settlement logic and where historically the pastoralism prevailed over the agriculture, with a substantial

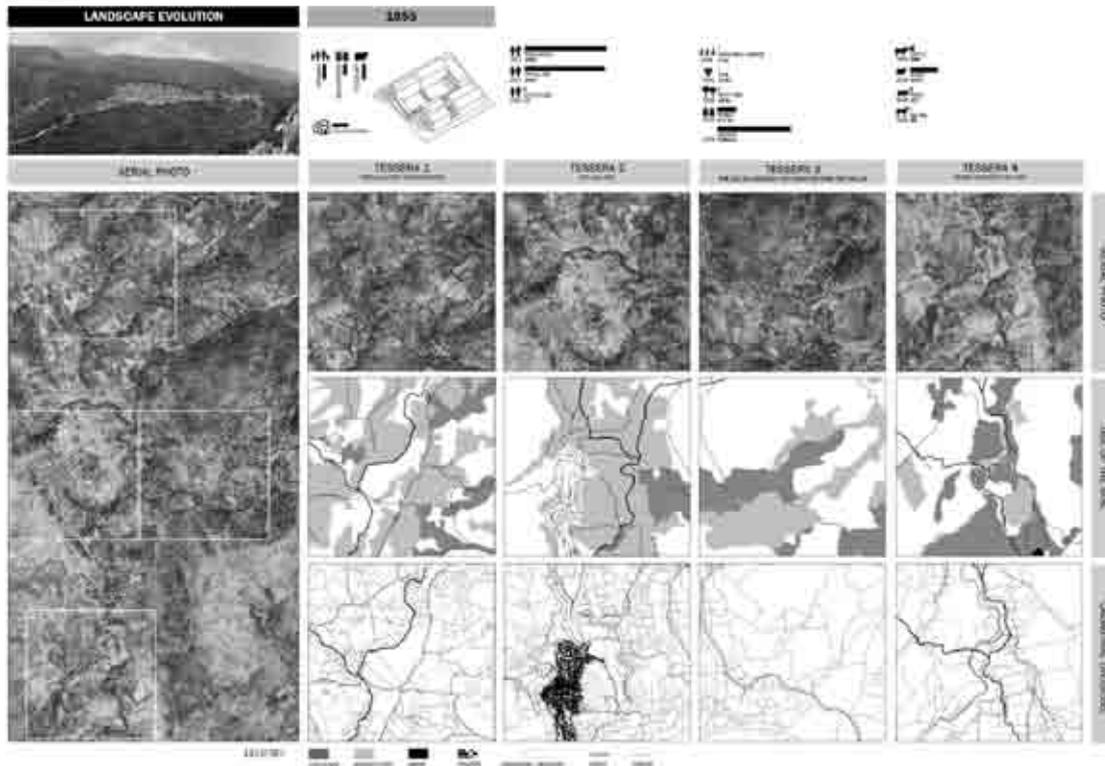


FIGURE 1. Landscape evolution. 1954

coexistence. In particular Gavoi is located on a hillside that leads down towards a small valley to the east where a river flows. Once the river is crossed, a second hill draws the landscape, historically structured by small cultivated terraces.

Since the '50s Gavoi was characterized by a transition to a monoculture of sheep farming, with the partial disappearance of the grain growth and the increase of the wood areas. The importance of this economic phenomenon can only be understood reading the ISTAT data, which show an increase in the number of sheep of + 3507.3% in 40 years, between 1929 and 1970 (from 2,103 to 73,758 heads). This passage is caused by the increase of the production of Pecorino Romano. If on one hand this process has led the village of Gavoi to live in a prosperous condition for at least 30 years, on the other side it has left deep gaps in the territory. Therefore a very relevant theme under the landscape point of view is the inversion of the historical/productive nature of the site, in which the pastoralism was only a part of a larger productive system. The suggested analysis examines the entity of these transformations and concentrate on the rural landscape areas regulated by the symbiosis between the city centre and its closest cultivated territory that ensured the subsistence of the village. The method starts with the individuation of considerable parts of the territory (tessera), the combination of statistical data and observation, to represent the transformations on different scales.

The analysis shows the diachronic evolution of the Gavoi territory, relating the four selected parts through three relevant

historical steps: the beginning of the pastoral monoculture (Figure 1: Landscape evolution. 1954), the greatest growth of this phenomenon (Figure 2: Landscape evolution. 1977), the contemporary situation (Figure 3: Landscape evolution. 2015). TESSERA 1_FROM VILLAGE TO DISPERSION. This tessera is located in the north of the village, in a productive site. The 1954 scenario shows a territory structured by a complex cadastral division with an agro-pastoral prevalence, characterized as well by the presence of micro-cultivation next to some natural elements like rivers, small hills and woods. In 1977 the themes of farms dispersion and re-naturalization of open fields are present and they are linked to the increasing of the pastoral economy. The micro-cultivations appear less intensive. In 2015 it is possible to read an additional growth of farms dispersion and re-naturalization, with a small recovery of the agriculture but with an almost total lack of micro-cultivations.

TESSERA 2_THE VILLAGE. In 1954 it is possible to read the compactness of the urban centre, constricted between the hill and the river. The whole system of the micro cultivations beside the east belt of the village border as well - extremely structured - is related to the river. In 1977 there were large transformations on the hydro-planning: the river in the northern part of the village has been buried, facilitating the urban expansion in that direction occupying the micro cultivations. In 2015 the deep urban expansion towards north and east completely invades the river micro cultivations sites, with architectural and urban forms distant from the historical logic.

TESSERA 3_ THE VILLAGE BORDER. The tessera shows the

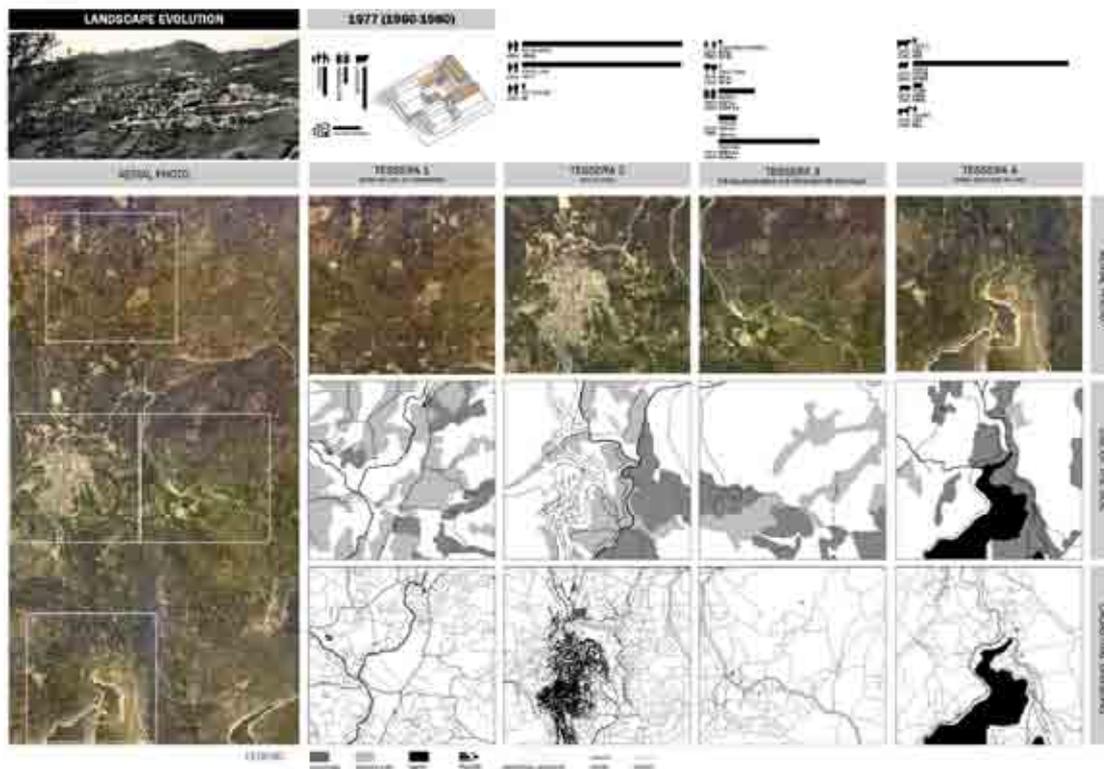


FIGURE 2. Landscape evolution. 1977

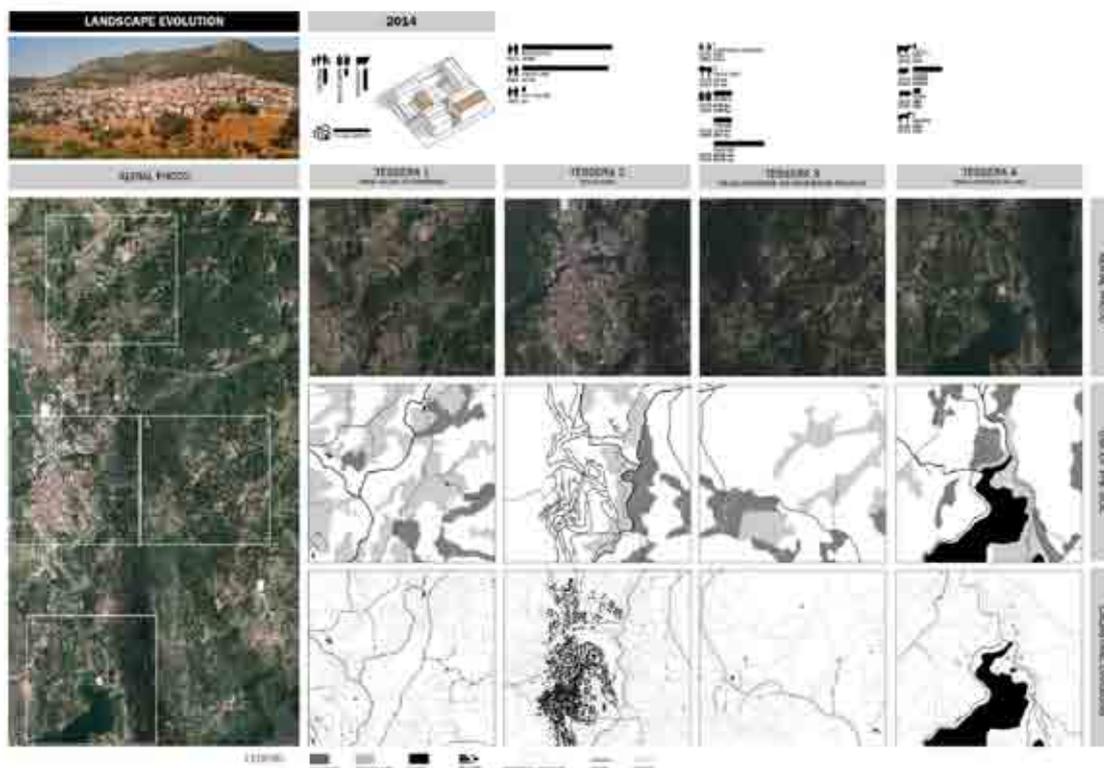


FIGURE 3. Landscape evolution. 2015

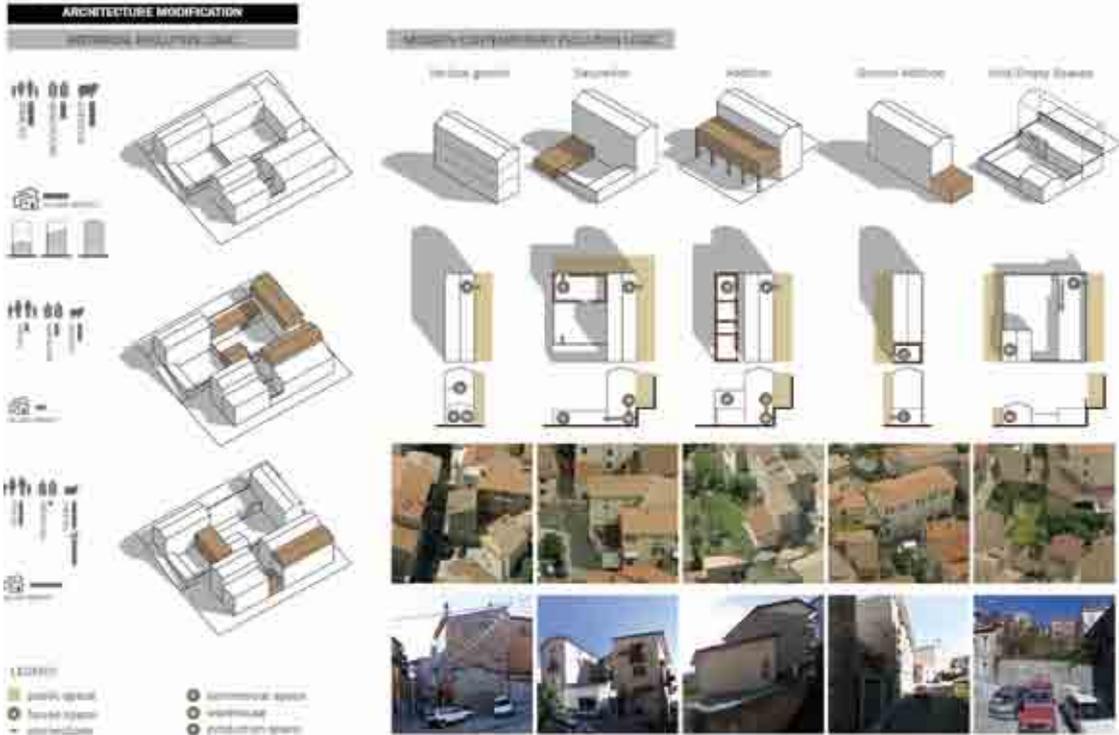


FIGURE 4. Architecture modification

area that overlooks the river valley. In 1954 it appears extremely structured by terracing in those lands which descend into the river - the real leading ecology of this system - whereas the larger open fields and pastures are located in the east where the area gets flatter. The transition to 1977 points out an almost complete abandonment and loss of the terracing landscape with a consequent re-naturalization of the whole area. In 2015 the territory is characterized by the abandonment of part of the open fields and pastures in the east. The theme of the farms dispersion appears.

TESSERA 4_FROM GRAZING TO WATER. The tessera is located in a southern area which is rather distant from the village and where the river structures are open fields and pastures area. In 1977 the construction of the dyke invaded part of those open fields and pastures, and those ones which were not invaded as well seem to suffer an abandonment and re-naturalization phenomenon. In 2015 it is possible to read the abandonment of productive settings and the appearance of touristic dispersion.

The described processes lead to the modification in time of the architectural elements of usual life that compose the houses and the village (Figure 4: Architecture modification). In the historical model, the spaces of the house contained some work practices necessary to the family life and connected to the food preservation or fermentation-maturation, but also to the small handmade production and to the protection of animals. The current economic structure has isolated the village from its

territory and the man from the daily work practice: the work space is no longer inside the village but outside, in large rural farms. In fact nowadays the spaces of the house have been often transformed into spaces without social life (garages - storages) or abandoned places. The architectural transformations of the last decades fully represent the gap between the historical connections and their contemporary rupture. In fact the decrease of the quality of the contemporary urban space is evident in architectural terms and in the inability to generate new forms of social interaction.

References

- Angioni G., Sanna A., *L'architettura popolare in Italia. Sardegna*, Laterza, Bari-Roma 1988
- Angioni G., *I pascoli erranti: antropologia del pastore in Sardegna*, Liguori, 1989
- Baldacci O., *La casa rurale in Sardegna*, Hoepli, Firenze 1951
- Brandolini S. e Pierre-Alain Croset. *Strategie della modificazione 1-2*. Casabella 498/499
- Casalis G., Angius V., *La Sardegna paese per paese*, Cagliari, 2004-2005
- Gregotti, V., 1984b. *Modificazione*. Casabella, 498-99
- Le Lannou M., *Pastori e contadini di Sardegna*, La Torre, Cagliari 1980
- Mura G., Sanna A., *Paesi e Città della Sardegna*. I Paesi, CUEC Ed., Sassari 1998
- Ortu G. G., Sanna A., *Atlante delle culture costruttive della Sardegna. Le geografie dell'abitare*. DEI, 2009;
- Turri E., *Antropologia del paesaggio*, Edizioni di Comunità, Milano 1974.

Advancing Landscape Architecture Research

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landscape architecture research | process approach | study design

The number of landscape architecture researchers is growing who are advancing the body of knowledge in their discipline. Still, a surprisingly large number of researchers have difficulty in describing why and how they selected particular methods and which choices they made when applying them. In this paper we are discussing perspectives for developing a common understanding of (a) the research process, (b) the designing of a research project and (c) the technical research design. Landscape architecture research involves studies that belong to a wide range of different approaches. In addition to doing case studies there is wide range of strategies to choose from when planning a research project. We are placing a focus on 'Research through Designing'. Examples are discussed making explicit what we are talking about at this 'generic' level.

In addition to facing methodological challenges study designers must also consider balancing resources and benefits. What size should a study have, and for how long should it be running? For example, one may generate evidence about the sustainability of a designed landscape only through conducting a long term study. If resources are sparse, and if no changes are noticed between one and two years of observation, the decision might be stopping the study. What, though, if the really interesting effects present themselves after five years, or even later? Using examples we are discussing what standards might help exclude bias from landscape architecture studies.

If landscape architecture is to advance as an academic discipline that can rely on its own body of knowledge close attention must be paid to research methodology and research methods. In addition, researchers must feel the urge to publish results from their studies in peer-reviewed journals and books, and also feel the need to take part in the scholarly debate on design research at large.

Introduction

From landscape architecture studies presented at conferences, we find that researchers usually have a good idea of their study topic. We also find a surprisingly large number of researchers who appear to be troubled when explaining the particular methods they applied and why they did so. It seems to be a small number of researchers who clearly report how they collected and analysed data, and how they extracted from them meaningful conclusions. Results from a number of surveys undertaken across Europe (Clewing and Jørgensen 2006; Bell et al. 2010; Fetzter 2011) show that landscape architecture researchers tend to pick from a large array of different methods, whereas of few methods it can be said, belong solely to landscape architecture.

Landscape architecture research is often considered multi-, interdisciplinary or even trans-disciplinary in nature (Deming and Swaffield 2011). This is challenging as the natural sciences, the social sciences, and the arts and humanities have different research cultures (Kagan 2009) with different notions of 'scientific research' and how it should be done. We believe that acquiring a common methodological language is vital if landscape architecture is to advance as an academic discipline that relies on its own body of knowledge. To overcome barriers between disciplines and their respective dominating disciplinary epistemologies, we advocate a process approach to research. In this paper we outline the main principles of such a process approach.

Image, Structure, Action

Academic research in landscape architecture differs from solving a design project commissioned by a client. In research we need to respond to standards and expectations set by the academic community at large. Landscape architecture research aims to expand our knowledge related to the shaping of landscapes and to processes of landscape intervention at various scales. Mainly through design solutions have landscape architects succeeded in the past and continue to succeed, in advancing their field. However, in almost all projects design solutions are area-specific or site-specific. Individual examples (e.g. different forms of case studies) hardly contribute to generating solutions which may be transferred more widely. At the same time we must not underestimate the extent to which creativity has been a feature of major scientific breakthroughs.

An integrated approach aimed at yielding knowledge through academic landscape architecture research will often deal with three aspects in a triangle combination: Image, Structure and Action. Image is all about perception, symbolism and the communication content of landscapes. Structure deals with the fabric of the landscape spatially, materially and in depth e.g. of the layers which constitute it. Action can include processes occurring in the landscape, taking place in it (e.g. human activities) or external forces affecting it. The integrated nature comes about when there are mutual dependencies which need to be understood through research: for example how people in a city make use of a park for various activities (action) depends both on the design and layout of the park (structure) and what they think of it – its safety or attractiveness (image). Likewise, the research can be organised to include methods which capture some aspects of each dimension and one of the dimensions can act as the entry point to addressing the problem. Missing one of the dimensions may lead to inadequate or incomplete results which cannot be applied successfully. One of the hallmarks of landscape architecture research therefore is its multi-faceted and multi-disciplinary nature.

A Process Approach to Landscape Architecture Research

Generating a common methodological language may be both challenged and enriched by the fact that landscape architecture research is interdisciplinary by nature. It draws from a variety of different knowledge areas and their related methods of inquiry, as well as its own. Acquiring a common language may be enriching if it facilitates making connections within and between different research cultures and opens aspiring researchers to approaches from which inspiration and experience can be derived.

Looking at the research process, three stages in a research project can be distinguished: designing the study, doing the research, and reporting (such as publishing a paper). Designing the research study consists of a conceptual research design and a technical research design. Identifying knowledge gaps and formulating research questions that relate to knowledge gaps are part of the conceptual design. The technical design focusses on how the research will be done. Here, commonly, one overall research question is broken down into two or more sub-questions, and methods to respond to these specific questions

are selected by researchers. First, results are obtained for the sub-questions. Then, answers to the overall research question are sought by synthesizing answers found to sub-questions.

Whereas research design is the design of the research project as a whole, study design is the design of the set-up of data collection (e.g. cross-sectional study, longitudinal study, experiment, case study; see Kumar 2014). For each sub-question one must decide and describe (a) the tools, or 'instruments', by which one collects data, and (b) the strategy, the 'sampling', by which one selects the objects on which data will be obtained. This means that the research question always leads. The key concepts in the research question direct decisions on the type of data collection method to be adopted, such as observation, questionnaires and interviewing. Data needs to be recorded by following standardized protocols. When the study design is experimental, protocols must be clear and a rigorous application carefully observed. If, for example, people's perception regarding the type of visualisation of future landscape scenarios is investigated in an experiment, people will be randomly attributed to different visualisations. These people would then be asked to fill in questionnaires to elicit their perceptions. For the resulting data to be reliable, a carefully designed choreography, detailed protocols and validated questionnaires are absolutely essential.

Standards exist for most of the methods landscape architecture researchers borrow from the natural and social sciences. For example, an interview is often used as a data collection 'instrument' processed by transcribing and then coded according to some coding protocol. Researchers have started to systematically collect reference cases and exemplary 'Test-Designs'. Standards would become available, such as sets of selected parameters to be used for conducting analysis and for designing and informed ranking.

The Relationship between Research and Design

Deming and Swaffield (2011: 206) emphasized "the unique quality" of the design process for research and, by calling this process 'projective', explained how designing only becomes an autonomous research strategy "when it produces new generalizable knowledge about the world through its purposes, protocols, and outcome". Understanding relationships between research and design is therefore of great importance to landscape architecture research. Three categories of relationships are: research into design, research for design and research by design (Frayling 1993). In Research-Through-Design(ing), RTD, a distinction is made between 'design' as a noun and as a verb. 'Design' as a noun is considered the outcome of the design process. Drawing, mapping, visualising, representing, giving shape and repeated analysis and reflection are some of the unique activities that constitute the process of designing (Lenzholzer et al. 2013). Research-Through-Designing is at the heart of all design disciplines (Rodgers & Yee 2015). If landscape architecture is to advance as an academic discipline with its own body of knowledge close attention must be paid to research methodology and research methods in RTD. RTD methods and methodology could become the centre piece of landscape architecture research.

References

- Bell, S., Stiles, R. and Jørgensen, K. (2010) LE:NOTRE Two Output report: Research and teaching ('Teaching for Research – Research into Teaching'). European Council of Landscape Architecture Schools, Internal report, available at <http://www.le-notre.org>.
- Clewing, C. and Jørgensen, K. (2006) LE:NOTRE Output year 3 report: European PhD in Landscape Architecture. LE:NOTRE Outputs, Year 3. Oslo, Norwegian University of Life Sciences and European Council of Landscape Architecture Schools, Internal report, available at <http://www.le-notre.org>.
- Creswell, J.W. (2014) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE: Los Angeles.
- Deming, E., and Swaffield, S. (2011) *Landscape Architectural Research: Inquiry, Strategy, Design*, New York: John Wiley & Sons.
- Fetzer, E. (2011) Development of a European doctoral programme in landscape architecture. Selected results from LE:NOTRE survey on doctoral education. European Council of Landscape Architecture Schools, Internal report, available at <http://www.le-notre.org>.
- Frayling, C. (1993) 'Research in Art and Design', Royal College of Art Research Papers, 1(1), 5.
- Kumar, R. (2014) *Research Methodology: A Step by Step Guide for Beginners*. SAGE: Los Angeles.
- Lenzholzer, S., Duchhart, I. and Koh, J. (2013) 'Research through designing' in landscape architecture', *Landscape and Urban Planning*, 113(0), 120-127.
- Rodgers, P.A., and Yee, J. (Eds.) (2015) *The Routledge Compendium to Design Research*, Abingdon and New York: Routledge.
- Van den Brink, A., Bruns, D., Tobi, H. and Bell, S., (2016). *Research in Landscape Architecture – Methods and Methodology*. Abingdon and New York: Routledge (in prep.).

Weakcity. Notes on Landscape Urbanism

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weakness theory | landscape urbanism | technonature

The research of Weakcity starts from the analysis of the word weak, and through its factorization and transposition, aims to delineate a theoretical-practical approach for a renovated urban design.

The title of the research paraphrases Weak Thought by Gianni Vattimo and Pier Aldo Rovatti, in which they refute the latest all-embracing legitimizations within a post-metaphysical and postmodern framework.

The purpose of the research is to experiment with how, inside the "construction" of the contemporary cities, a weak approach is able to defy the object/architectonic event and established methodologies of urban studies, by going beyond the designative value of architecture.

In this direction, the notion of ecology and of an ecological system, as intended by Landscape Urbanism, becomes the disciplinary infrastructure of the method, in which ecology is technonature, or an evolution of nature in artificial terms.

Weakness theory has been developed at Politecnico di Milano in 50 case studies. (E.C.Cattaneo, WeakCity Research).

*"Maybe it doesn't only happen to me,
but also to all those who civilization has given birth to for the
second time.*

*Yet I feel that for me, or for those who feel like me,
artificiality has become a natural thing, and what is natural
seems odd.*

*I stand corrected: artificiality has not become natural:
natural has become different."*

Pessoa, The Book of Disquiet, 1982

The hypotheses of the weakcity (Figure 1) identify the problem of architectural design in the exaltation of the architectural object-project's role and of its fixity, intended as a synthesis of a designation process that absolutizes conceptual methods and shapes.

This assumption is indicative not only of a compositional argumentation, but activates broader considerations related to the method/project relation, and it is referable to a cultural system that, in a bipolar manner, is more and more concentrated on the exaltation of the magnificent, of the extraordinary, of the subjective, and of self-referential, atopic shapes. On the other side, contemporary research resists experimenting with a new projectual method.

An attitude that belongs to the culture of the present, we underline hereby three principal causes that become the assumptions of the weakcity:

The need for an approach distancing itself from designation and exactitude as synthesized by the architectonic object and urban design, the current approach being ineffective to solve the new urban problems. We fractured, in this sense, the identification between project-object (which implies the relation project =

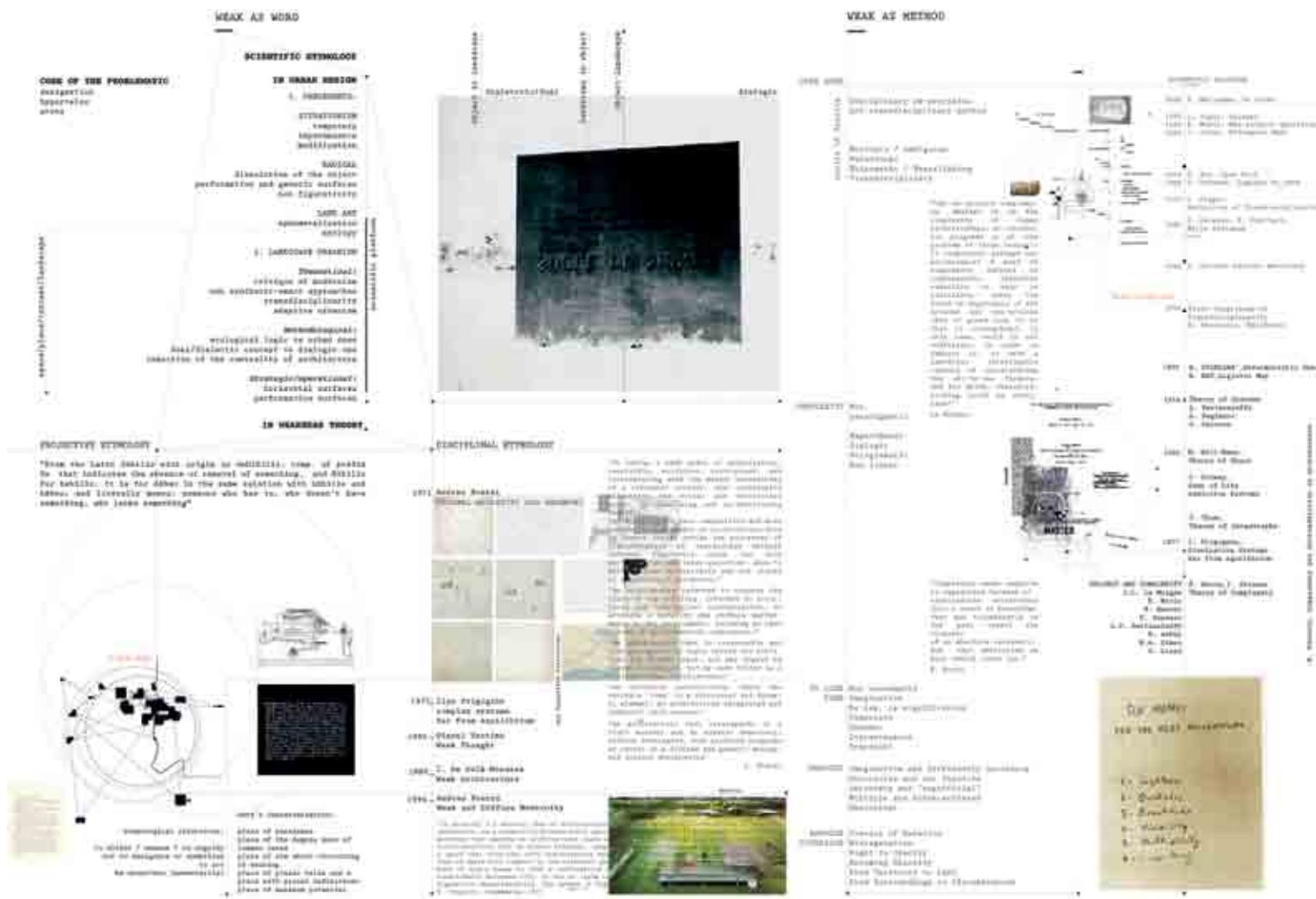


FIGURE 1. E. C. Cattaneo, Weakcity, Method, 2013

methodological causality, project = drawing, project = type); The second assumption is definable as the hypertelos of architecture. The correspondence to the real produces simulative shapes rather than interpretative/imaginative ones. The third, in line with the preceding ones, is definable as atony: the expression of a monotonous line that is unable to observe differences, suspensions, or alternations of spaces. Atony is referable to two specific conditions: the first is the linguistic homogeneity of contemporary architecture, which reveals itself bipolarly in lexical and methodological equality (revisiting the globalizing currents). The second, consequently, is the loss of place-specific conditions. In this sense, atony is closely related to the concept of atopy.

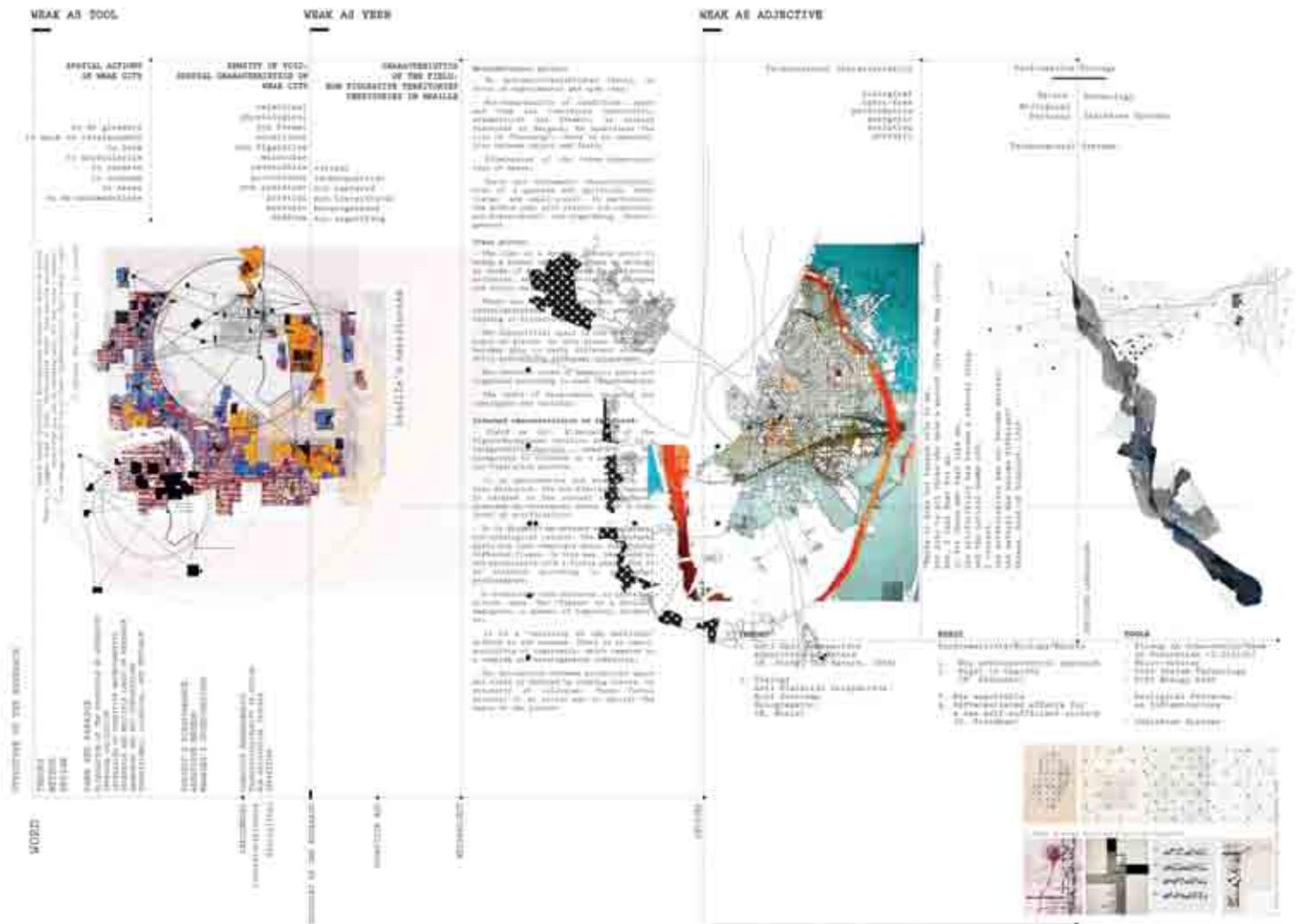
The three summarized conditions represent three different levels of reduction, in a different and consequential way, and they specify the hypervaluation of designation as a projectual principle: the first explicates the need for a new methodological means freed from established codexes; the second represents the inability of the architectural object to renounce itself; the third underlines the incapacity to be thought as dynamic and differential moments of a process, for which “the essence of architecture is its disappearance.” (E. Cattaneo 2013)

The method of the research is based on branches related to non-figurative and non-designative spaces, intended as an inverse codex within urban theory.

In particular, the relation with landscape urbanism amplifies the role of the short circuit within the hermeneutical steps related to the theory-project relationship. In fact, we can read this relation as connected to the sequences space-place-context-landscape (E. Cattaneo 2013). (Figure 1)

In this sequence, landscape urbanism is a new, as well as the latest, experimentation developed with a renewed approach:

1. Theoretical:
 - Through the critique of Modernism and synthetic-exact approaches.
 - Through transdisciplinarity as a scientific development of continuous regeneration, to substitute for the “science of space”.
 - Through the formulation of an adaptive urbanism.



2. Methodological:

- Substitution/hybridization of ecological logic for urban ones (plan, programme, urban design).
- Overcoming of the dual/dialectic concept (as culture/nature, nature/city, figure/background) to privilege a dialogic one, as suggested by theory of complexity.
- Reduction of the centrality of architectonic scale and architecture in general as a topic for urban design.

3. Strategic/Operational:

- To privilege horizontal surfaces over vertical ones, by reactivating the concept of field as the favoured space of transformations and relations.
- In the role of performative surface. In this way, we discard each vernacular/romantic idea related to landscape.

Radically amplifying the previous landscape urbanism framework, in a vision that considers the nature-artefact relation as crucial, the weakcity finds its specification within the interpretation of the word technonature, for individuating its theoretical-methodological potentialities (as a new ecological modality for rethinking territorial and urban planning),

its operational modalities (in terms of a specific strategy to produce), and linguistic potentialities (as in transdisciplinary hybridizations).

In this sense, the weak programme will respond to the project crisis (and its tools) by planning new ecological and formal logics.

In terms of the theoretical-methodological conditions, technonature is rooted within the philosophy of science and we can specify it as a new concept of nature, able to overcome both the dichotomic relations linked to the city and each vernacularism, immanentist hybridization, and reconciliation, including the aesthetics of disappearance, camouflage, metaphor and, above all, each restorative deviance of environmentalism and sustainability.

Because of its ecological and anti-dialectical perspective, technonature considers nature a continuous renewal of its specific capacity of genesis, of creation and, above all, of adaptation, “by absorbing the artificial as its component, eliminating the anemic categories of membership and

ultimately aspiring to that wonderful regenerative fluidity that elides opposites by making them its own.” (M. Ponty 1966)

In other words, “We observe a paradigmatic hue: which seems like a hybridization between the natural and its opposite - the artificial - is instead an alternated interpenetration that allows us to read the transformative reality of nature. More simply, the concept of nature is denaturalizing itself from a secular fixity, by producing one of the most revolutionary changes that has ever occurred in history (...) Through this conceptual “thawing,” it finally “melts away from the immanentist hibernation that has always haunted it.” (M. Ponty 1966)

As a provocation, technonature becomes the possibility for a new way of thinking about the ethics of the environment, far from every vernacular, romantic, nostalgic, or symbolic position.

Nature, in this direction, acquires the characteristic of maximum productivity, of maximum potentiality, due to its modification/integration with culture, with technology, with artificial knowledge.

As Pessoa said, “Artificiality is a way to savour naturalness [...] civility is the education of nature. Artificiality is the path toward an approach to the natural.” (F. Pessoa, 1982)

We want to develop this new perspective and to maintain it as a research condition, capable of combating the urban conditions, not by retreating but from within, according to an anti-dialectical perspective between nature and artifice. In this sense, the second concept is incorporated by the first in that, in the power of its re-signification, it will absorb new genetic, productive, and projective attitudes.

From a more urban point of view, we investigate Nature’s possibility to absorb the productive and performative capacities of artificial space: to become a productive strategy of urban resources, in energetic, formal, and social terms.

By quoting Andrea Branzi: “The territory is the privileged protagonist of the post-industrial economy, acting as a place for working out the weak and diffuse energies of a powder-fine productivity [...] natural technology is becoming a constructive model, a more sophisticated model [...] the artificial world, born to substitute an inadequate nature, is discovering nature as the realm of an unattainable technology “ (A. Branzi 1994).

As opposed to an idea of landscape as a romantic/narrative project, we introduce a new structural landscape in the context of the city, able to generate a new urban aesthetic.

References

- Branzi, A., 1994, *Weak and Diffuse Modernity*, Skira, Milano, 1994;
Cattaneo, E. C., 2015, *WeakCity*, List, 2013;
Cattaneo, E. C., 2013, *Loaded Void. City Theories since 1956*, Maggioli Politecnica, 2013;
Deleuze, G. , 1969, *Logique du sens*, Éditions de Minuit, Paris, 1969;
Nicolescu, B. , 2002, *Manifesto of Transdisciplinarity*, Suni Publisher, NY, 2002;
Merleau-Ponty, M. 1966, *Nature*, Northwestern University Press, 1966;
Rovatti, P. A., Vattimo, G., *Il pensiero debole*, Feltrinelli, Milano, 1983;
Waldheim, C., 2006, *The Landscape Urbanism Reader*, Princeton Architectural Press, 2006 .

Inside Out: Applying Experiential Learning During the 2014 Hong Kong Protests to an Urban Environmental Design Studio Context

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umbrella movement | context | site analysis | landscape design | studio

This article presents a brief overview of a third year undergraduate Interior and Environmental Design 'option' studio which aimed to engage students in the design of situated tactical 'interior' interventions in the 'exterior' urban landscape by drawing on their first-hand experiences of an informally occupied urban environment. It presents the background, programmatic concerns and methods of the transdisciplinary studio's problem-setting approach. It then explores how the students' subjective observation and experience of a 'real world' scenario (i.e. of informally living outside during the 2014 Hong Kong protests, also termed the Umbrella Movement) translated to their ability to identify, map, diagram and analyse key issues and sites and whether and how that process enabled the students to effectively contextualize and envision hybrid 'inside-out' interventions.

Background

As evidenced by the transformation of public infrastructural spaces into dynamic exterior living environments during the 2014 Hong Kong protests, also termed the Umbrella Movement (UM), Hong Kong's urban landscape has the capacity to contain and house a large number of people and provide for their needs, from the essential, to the environmental, to the socio-political (Lee 2015; Lee, So & Leung 2015; Borio & Weuthrich 2015). The UM saw tens of thousands of people illegally occupying public streets, sidewalks and parks in key commercial and logistical areas in Hong Kong for 79 days, (Figure 1) progressively necessitating a wide variety of occupation and survival strategies and tactics which, although initially unfamiliar to student leaders and the average student or citizen supporter of the movement, are typical of protest camps in their media and communication, protest action, and 're-creational' infrastructures and practices (Feigenbaum, Frenzel, & McCurdy 2013), which can meet primary, secondary and higher order needs (Maslowe 1943; McLeod 2014). The adoption of these infrastructures and practices essentially translated into Hong Kongers being able to live outside (rent free!) for over two months in a self-sufficient community with like-minded individuals: a new and unique opportunity in a city where the rhetoric of limited land supply and high housing prices dominate discussions concerning cultural and social inclusion and identity. Instead, the protests allowed for discourses to surface and circulate which focused on political and social ideals as well as the right to the city. Also significant to the nature and tone of the occupation was the collaborative and participatory nature of the process of providing for the basic necessities of life in a hostile environment and the active exchange of expertise between different age groups. Even more significant was the high number of students who actively took part in building and sustaining the Movement through their volunteer efforts, whether in cleaning, citizen journalism,



FIGURE 1. Transforming infrastructural spaces into places for living during the HK Protests, Sept 26-Dec 15, 2014 HK. Clockwise from top left: Walking from Central to Causeway Bay, Oct 1; Steps over highway divider, Nov 14; Recycling station at Legco camp, Oct 31; early morning domestic scene, Oct 21; Legco women's public bathroom with shared/donated toiletries, Oct. 31; and campsites under the highway overpass, October 31. Photo credits: Melissa Cate Christ

transporting and managing supplies, building and maintaining shelters and barricades, or engaging in arts, cultural or technological practices.

Concerns and Methods

With the above mentioned events taking place in the term immediately prior to that of the studio, and given that the studio brief for this third year undergraduate Interior and Environmental Design 'option' studio was required to address 'interiority', and also that all of the students in the course (and the instructor) had taken part in the protests in some way, the studio took the students' first hand experiences of occupying public space during the protests as its starting point. The primary research question this article is addressing is therefore: how did the students' first hand observations and experience translate to their ability to analyze and design public space interventions? To address this question, the studio brief asked the students to look beyond the success or failure of the movement's political demand for 'true universal suffrage' to consider how the occupation reinvigorated a cultural awareness regarding Hong Kong's perpetual spatial inequality and degraded living environment. How could this awareness serve as a way to interrogate the potential other urban landscapes in Hong Kong have for 'occupation', for providing the basic physical and social necessities of life? These questions required the students to examine the logic and methods of the physical occupation during the protests, when the students, in a process of real-world, experiential learning (Kolb 1984) saw the potential of urban spaces with their own eyes, not just as places to pass through, but as places to live. By proposing that

the tactical and nuanced occupation of primary and liminal spaces previously (and now, again) devoted to cars or restricted by rules and regulations to single uses be seen as a provocative starting point to imagine tactics for the multifunctional reprogramming and design of Hong Kong's in-between, abandoned, and underused or single-use public spaces, the goal of the studio was to problematize, explore and design for and within these hybrid 'inside out' places.

Projects and Analysis

Understanding the urban environmental design studio as an interactive, engaged platform where "the chief agent in the process is the learner. [And] students must be active discoverers and constructors of their own knowledge" (Barr & Tagg 1995, 21), a problem setting approach was utilized (Diefenthaler 2008, 306). This approach enabled the students to combine their subjective experiences of the spatial occupation of the city during the protests, a close site and contextual examination of the urban landscape, and an analysis of what protesters needs were and how they were provided for, into a collaborative document of programmatic needs and location typologies of existing and potential situations and sites for intervention. Both the practical and minimal provision of basic human needs, as well as cultural and social practices such as camping, street sleeping, goods storage and delivery, waste disposal and collection, hygiene, entertainment, recreation and gathering, eating and tourism were studied to identify and diagram these often ignored processes and spaces (Figure 2). The students were also asked to research and document case studies and precedents, which they then included in their final collaborative

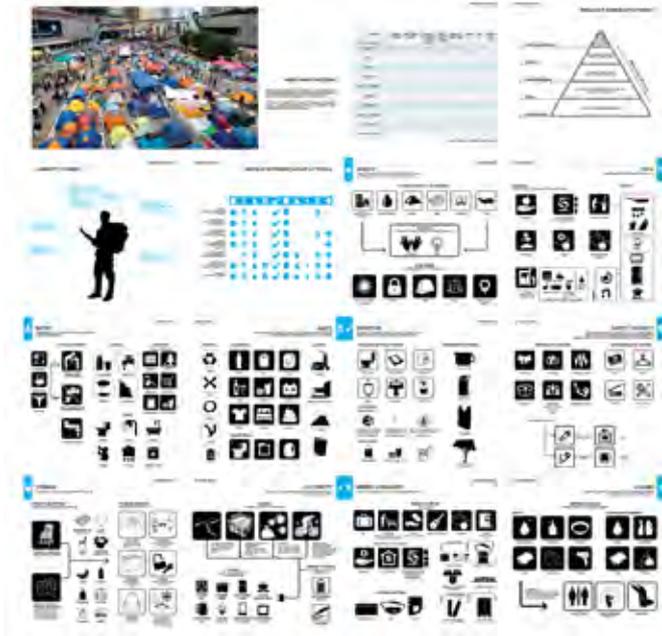


FIGURE 2. Student analysis and documentation of needs, materials and sources for living outside based on both first hand experience and site and contextual analysis. Diagram credit: HK PolyU SD3561 2015 students

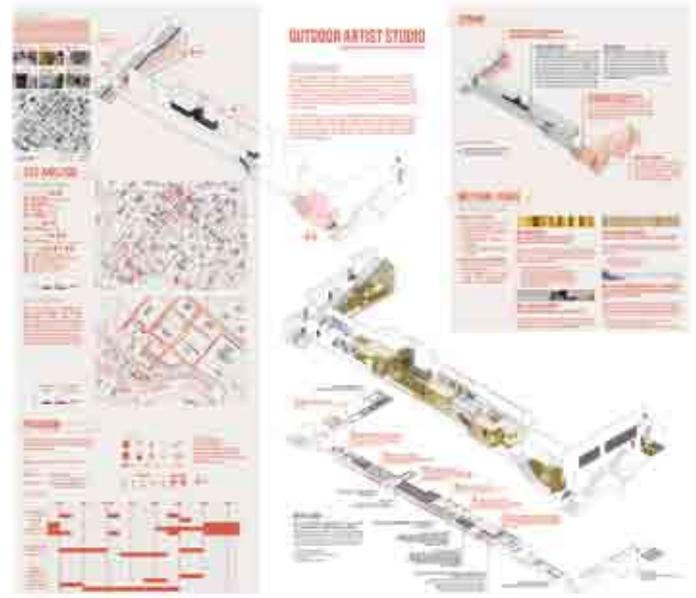


FIGURE 3. Student project sites a live/work artist studio in an underused alley to take advantage of existing overhead shelter and nearby public toilet. Image credit: Wong Shu Ting

document, “Guide to Living Outside in Hong Kong”. Key findings of the first part of the project included tactics learned from squatting and street sleeping practices and the importance of siting your ‘camp’ close to basic needs such as electricity, water and a bathroom. This research informed the second part of the project, where the students documented and mapped a selection of Hong Kong public toilets and paired this mapping with the location typologies to select a site and programme for their individual final design project, while also employing what they had observed in the protests, as well as what they had documented in the first stage of the project. Individual student site selections and projects ranged in scale from coffin-bed hotel structures installed along a staircase, to a public toilet renovation, to a live/work artist studio in an underused alley (Figure 3), to a hostel in a disused market entrance, to the conversion of an empty lot into a multi-functional performance and camping area, to a 75 room capsule hotel attached to a highway overpass. All of the projects conveyed a nuanced and contextually sensitive approach to their site selection, analysis and design, taking advantage of existing topographical and infrastructural features, building facades, plantings and social and cultural uses of spaces. This type of approach, rather than a more typical one which considers a site flat and empty, demonstrated that they had learned how to look closely at people and the urban environment in order to determine and provide for human needs in relation to a landscape, such as they did when they helped to build stairs over a highway divider, or when they choose an overpass-covered spot to site their tent during the protests. In general, the projects used design to exploit the climate, public service landscape and structural density of the city and worked to transpose interior programs to exterior spaces, with varying degrees of success, and with more formality than the informality envisioned initially by the instructor.

Conclusion

Both in the first mapping and research exercises, which created a ‘Guide to Living Outside in Hong Kong’ and in the subsequent design projects, contextual and site analysis played a major part in the polemicization of broader issues and questions about the role of design in the use and potential of shared spaces in the city. The design projects were not universally successful, with several adequately addressing conceptual and contextual concerns, but failing to progress beyond a schematic design resolution, while others skillfully focused on resolving detail design issues without reflecting enough on the initial assumptions and implications of their interventions, such as the installation of a hostel into the disused entry stairs of a public market. However, in total, given the difficulty of the newly introduced methodology of problem setting and the scope of the project, it seems that the experiential learning process of the protests did give the students a sensitivity which enabled them to better learn how to effectively contextualize, site and envision hybrid ‘inside-out’ interventions in the context of an urban environmental design educational programme.

References

- Barr, Robert B. & John Tagg, 1995. From Teaching to Learning – A New Paradigm For Undergraduate Education, *Change: The Magazine of Higher Learning*, 27:6, 12-26.
- Borio, Geraldine and Caroline Wuethrich, 2015. Umbrella Movement Mapping, Hong Kong. Accessed online <http://www.parallellab.com/works/umbrella-movement-mapping/>
- Diefenthaler, Annette, 2008. "Problem Setting" in *Design Dictionary: Perspectives on Design Terminology*. Eds. Michael Erlhoff and Tim Marshall. Basel: Birkhauser. 306.
- Feigenbaum, Anna. & Frenzel, Fabian. & McCurdy, Patrick, 2013. *Protest camps*. London: Zed Books.
- Freire, Paulo, 1970. *Pedagogy of the Oppressed*. New York: Continuum.
- Kolb, D. A., 1984. *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice Hall.
- Lee, Eunsoo, 2015. Space of disobedience: a visual document of the Umbrella Movement in Hong Kong, *Inter-Asia Cultural Studies*, 16:3, 367-379.
- Lee, Paul S. N., Clement Y. K. So & Louis Leung, 2015. Social media and Umbrella Movement: insurgent public sphere in formation. *Chinese Journal of Communication*, 8:4, 356-375.
- Maslow, A. H., 1943. A Theory of Human Motivation. *Psychological Review*, 50(4), 370-96.
- McLeod, S. A., 2014. Maslow's Hierarchy of Needs. Retrieved from www.simplypsychology.org/maslow.html

'Exploding to the Infinite': Dan Kileys' North Christian Church

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Dan Kiley | north christian church | infinity | modernism

Completed in 1964, Dan Kiley's North Christian Church (NCC) in Columbus, Indiana (USA) was one of his approximately forty projects in Columbus. This paper seeks to profile this project by briefly describing the project itself and by interpreting the project through Kiley's oft-stated intention to express a sense of infinity in his work. While relatively understudied, Kiley's NCC landscape presents a unique example from his oeuvre of his expression of infinity. Like other Kiley landscapes, such as his nearby Miller Garden (1955), the NCC landscape replicates the continuously varied experience of a walk in nature while also providing a sense of spatial infinity. While other Kiley landscapes connect physically and conceptually to adjacent, contextual landscapes, the NCC landscape uniquely connects both physically and conceptually to the sky, to the cosmos, and to the heavens. The NCC landscape therefore connects to the infinite in a vertical sense in addition to connecting to the infinite in a horizontal sense.

Dan Kiley (1912-2004) is widely considered one of the most highly regarded American landscape architects of the twentieth century. The North Christian Church (NCC) in Columbus, Indiana (USA), designed by Eero Saarinen and completed in 1964 (Figure 1), was one of Kiley's approximately forty projects in Columbus, along with the approximately contemporaneous, yet more famous and more intensely reviewed, landscapes at the Miller Garden (1955), the Irwin Union Bank and Trust Company (1964; now called the Cummins Inc. Union Office Building), and the Hamilton Garden (1965).

There is scant scholarship and critique on Kiley's NCC landscape; only Marc Trieb (Trieb 2009: 62–63) and The Cultural Landscape Foundation (The Cultural Landscape Foundation 2013: 27) have written anything on the project, amounting to a total of three paragraphs. This paper seeks to profile this project by briefly describing the project itself and by interpreting the project through Kiley's oft-stated intention to express a sense of infinity in his work. Kiley's NCC landscape presents a unique example from his oeuvre of his expression of infinity.

The NCC landscape currently occupies 5.49 hectares of flat land in north suburban Columbus, Indiana, a small town of approximately 46,000 residents. The church itself sits in the western quarter of an east-west oriented rectangular parcel of land. To the north and south of the church are groves of Magnolia (*Magnolia x soulangeana*) trees arranged in a quincunx grid. The northern Magnolia grove was planted in 1967 or 1968 with trees spaced approximately 5m x 6.5m, and the southern Magnolia grove was planted sometime between 1972 and 1974 with trees spaced approximately 6m x 8m. To the east of the church is a four-bay parking lot, with a broad, open lawn located immediately south of the parking lot. The eastern half of the property is occupied by an irregularly-arranged



FIGURE 1. North Christian Church, Columbus, Indiana, USA. The lawn is in the foreground, with the southern Magnolia grove at left and the parking lot at right (behind hedge).



FIGURE 2. North Christian Church, Columbus, Indiana, USA. Emerging from under the southern Magnolia grove as one approaches the lawn. The parking lot (left) and woodland (right) are in the distance.



FIGURE 3. North Christian Church, Columbus, Indiana, USA. View from within the southern Magnolia Grove.



FIGURE 4. North Christian Church, Columbus, Indiana, USA. View of grass berm between southern Magnolia grove (left) and the pitched Church roof (right).

woodland of mixed mature hardwood trees. Vehicular access to the parking lot is through this woodland. Allées of red Maple trees (*Acer rubrum*) line the western and southern edges of the property.

Since the 1960s, through various writings and interviews, Kiley has repeatedly and consistently expressed his intent to create a sense of infinity in his work. Kiley often spoke of a “walk in nature” or a “walk in the woods” as a source of inspiration in his work, describing it as a “tremendous, limitless experience” (Kiley 1993: 10), in which the sense of infinite spatial movement is an “exciting thing to work with” and “the medium you’re working with in modern landscape design” (Kiley 1978; cited in Walker and Simo 1994: 179). Kiley noted in the 1993 Process Architecture monograph:

Every time you walk in nature it is a fresh experience. Whether you squeeze through a small opening in the maple trees, pick your way across a rushing stream, or climb a hill to discover an open meadow, everything is always moving and changing spatially. Space in nature, like that in a maze, is ever continuous and elusive. An understanding of spatial continuity frees the designer, taking him from [sp.] the static past into the limitless future. Design should relate outwardly to a context, but should also explode spatially – to the infinite. (Kiley 1993: 10)

In this, as in other statements about infinity, Kiley refers to infinity in two different ways. First, Kiley speaks about a modernist notion of space – continuous and unobstructed – as an experience of infinity. Second, Kiley considered infinity as a means of connecting a site to its context, from the immediately adjacent landscape to the regional landscape and ultimately to the universe. Kiley was always considering how his work fit into a larger context, at multiple scales, enjoying the challenge of creating designs that “seek . . . infinite relationships outward to the universe or rather with the universe” (Kiley 1963: 127).

The NCC includes a composition of landscapes – woodland, lawn, and grove – that provide a variety of phenomenological experiences, much like how Kiley describes his walks in nature (Figure 2). This composition is similar to that at the nearby Miller Garden, a project executed for NCC member Irwin Miller just 0.7km to the southwest and nearly 10 years prior. For Kiley, this varied composition of landscapes provides the foundation for a dynamic and continuously changing experience that creates the setting for an experience of the infinite.

The experience of walking through the Magnolia groves is a different kind of experience of infinity - an experience not defined by variety, but defined instead by insistent regularity. Referencing Edmund Burke's definition of the artificial infinite as a succession of uniform elements (see Burke 1759: 68), the quincunx grid of Magnolia trees are a series of repeating trunks, canopies, and the spaces defined therein (Figure 3). The uniformity of the trees-as-figures and the interstitial spaces-as-ground defines no set path through the grove, nor a prescribed beginning and end to any path. One could easily imagine that these elements, both the trees and the spaces they define, could be repeated indefinitely in all directions.

Kiley's expression of infinity as a means of connecting to context is the aspect that makes the NCC landscape unique among his oeuvre. Kiley's intention to connect to the site's context is often achieved horizontally, through either reference in his designs to the existing and adjacent context and/or through a blending of his designs with the existing context. For example, the Miller Garden achieves this connection by integrating the garden and lawn with the existing riparian woodland at the western edge of the site via the Red Maple avenue along the lawn's southern edge. In a similar way, Kiley integrates the existing woodland at NCC into the overall landscape, requiring the visitor to pass through this landscape as they enter via automobile along the entry drive. Kiley also references the agricultural context of Columbus and Indiana through the use of the Magnolia grove-as-orchard. However, the NCC landscape uniquely references context in a vertical sense. After walking through the vertically confined, if horizontally infinite, space of the Magnolia grove, then approaching the grass berm that surrounds the church, one's eye is lead upward along the berm and then in a nearly uninterrupted fashion along the sweep of the slate roof, towards the top of the 58.5m spire topped by a gold leaf cross, and into the sky, to the cosmos, and to the heavens above (Figure 4). This vertical integration of site to the universe-as-context is achieved only by the integration of landscape with architecture and the collaboration between Kiley and Saarinen.

The general expression of infinity at NCC not only reinforces similar expressions in other projects, but also broadens the possibility of expressing infinity by doing so in a uniquely vertical sense that is closely tied to the programme of the project itself. Churches were a rare project type for Kiley, and the NCC project expresses a uniquely vertical connection to the infinite rare in his other projects, providing a better understanding of the possible breadth of expression of infinity in Kiley's oeuvre.

References

- Burke, E., 1759. *A Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful*. A. Phillips, ed., 2nd ed. 1990. Oxford: Oxford University Press.
- Kiley, D., 1963. *Nature: The Source of All Design*. *Landscape Architecture*, January 1963, 127.
- Kiley, D. 1978. *Conversations with Peter Walker and students in a graduate seminar*, Harvard Graduate School of Design, Cambridge, Massachusetts (unpublished).
- Kiley, D. 1993. *What Is Design? Dan Kiley: Landscape Design II, In Step With Nature*, *Process Architecture* 108, 8–17.
- The Cultural Landscape Foundation, 2013. *The Landscape Architecture Legacy of Dan Kiley*. Washington, D.C.: The Cultural Landscape Foundation.
- Treib, M., 2009. *Dan Kiley: The Nature of Space*. In: R.M. Rainey and M. Treib, eds. *Dan Kiley Landscapes: The Poetry of Space*. Richmond, California: William Stout Publishers, 56–77.
- Walker, P., and Simo, M., 1994. *The Lone Classicist*. In: *Invisible Gardens: The Search for Modernism in the American Landscape*. Cambridge, Massachusetts: The MIT Press, 170–197.

Design Principles and Guidelines: Bridging the Gap Between Science and Design

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design theory | design principles | design guidelines

Landscape architecture is growing as a discipline and more landscape architects than before choose an academic career and get their PhD. New academic journals emerge and papers get published. In landscape architecture schools however, a gap is growing between more research and more design oriented students and teachers. Possibly the development of so called design principles and design guidelines could be a middle ground between doing only research or only design. A study of recent Phd studies and Msc studies explores the development of design principles and guidelines as a product that holds the middle ground between design and research. Design guidelines offer what Aristotles has described as Phronesis “knowledge in the making” and perhaps what Cross refers to as designerly ways of knowing. Design guidelines are less specific than individual design solutions for a specific location and thus are a form of generalised knowledge. The examples point to the usefulness of design principles and guidelines, but also point to the requirement of testing. It is therefore doubtful whether well-developed design guidelines are the timesavers our students hope them to be.

Introduction

Landscape architecture is growing as an academic discipline. This leads to growing numbers of PhD’s, new academic papers and new journals (Vicenzotti et al. 2016). Vicenzotti et al however do show that there is a lack of design-oriented papers in journal landscape research, indicating an increasing academic focus, as one of the causes for this shortfall. In the landscape architecture schools a growing rift is showing between more research and more design oriented students and teachers. Possibly the development of so called design principles and guidelines could be a middle ground between doing either research or design. A study of recent Phd studies and Msc studies explores the success, but also the pitfalls, of developing design principles and guidelines as something that holds the middle ground between design and research. An important question for this paper is what separates a design principle from design guidelines or designs proper.

Design Principles

Design principles are generally used to describe general principles that are valid for the design-area as a whole. There is a general principle (see Figure 1) for dealing with excess rainwater for “holding, storing and slow draining” (Hamers 2009). Such principles are abstract and are used to organise larger areas and denominate functions that should be thought of for an area. The principles focus the attention of the designer on the parts that should be present in a complete and resilient system. Design principles are mostly provided with words or cartoon-type drawings that are not site specific. In circumstances of urban heating design principles it could be that urban green is generally a good option to counter urban heat, both on a meso-level of a city countering the urban heat island effect and on a micro-level in individual streets. (Figure 1)

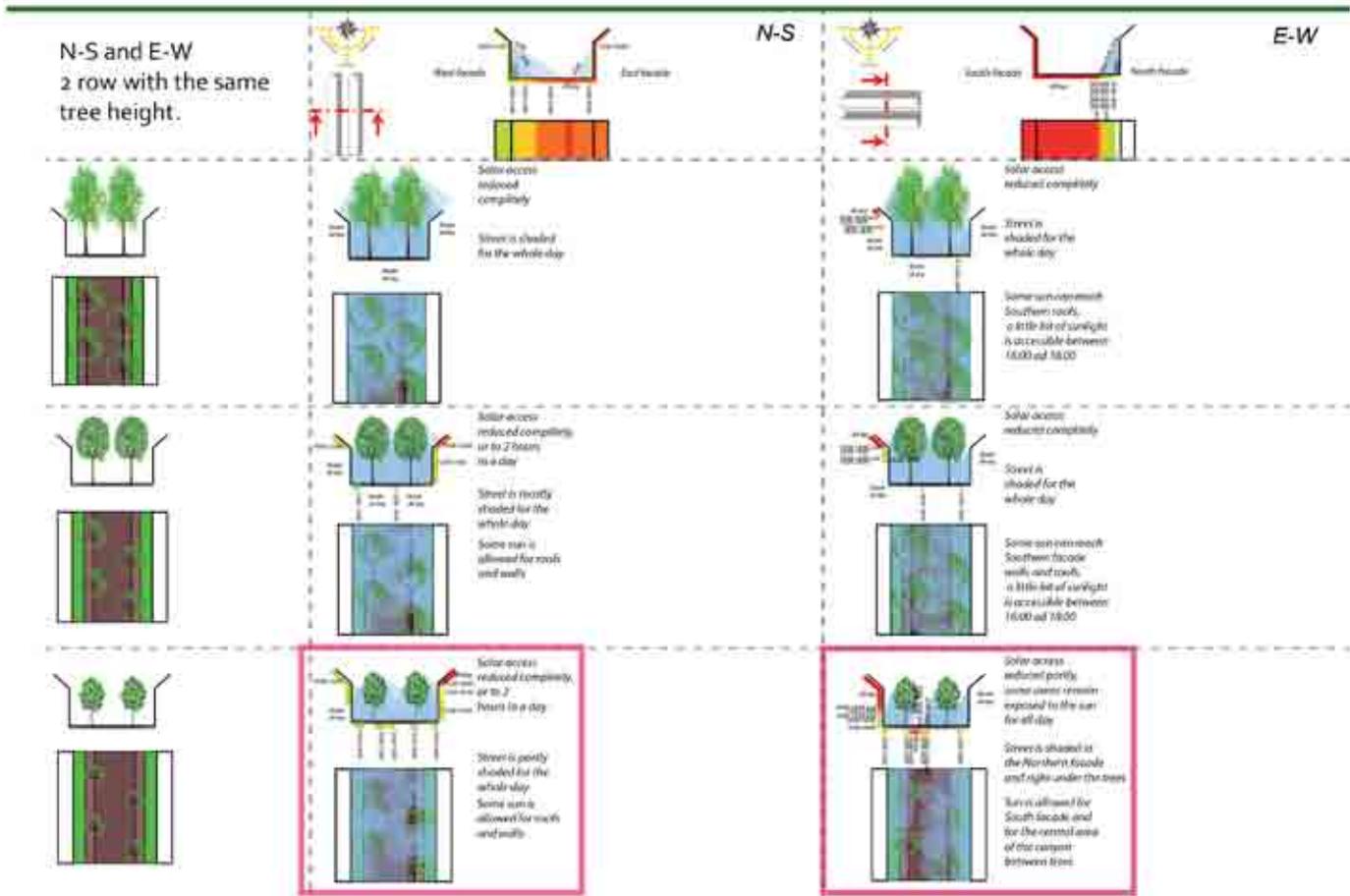


FIGURE 1. Design principle for dealing with storm water: 1 holding, 2 storing, 3 slow draining)

Design Guidelines

Design guidelines are less general and are applicable only in certain spatial circumstances. Design guidelines for dealing with excess rainwater could be a prescription for the use of green roofs on roofs with a gentle slope. For other steeper sloped roofs a solution of a hidden gravel-bed for onsite storm water detention in the garden, or an interconnected rhizomatic system of plastic crates under the pavement could be a design guideline (Hua and Liu 2012). It exemplifies how the principle of retaining can be applied in a certain prototypical solution. As an example for a design guideline for dealing with urban heat one could show a typical cross-section of a street combined with a certain orientation. In the analysis it would be indicated where due to a street's orientation urban heating is most likely to occur. The design guideline shows how and where to deal with urban heating in a prototypical situation. For instance in an east-west oriented street with a height width ratio below 3 the north side of the street is likely to be heated up considerably during hot sunny days. Providing shade by for instance by providing trees in the street adding an extra shade can cool down that street on hot days (Hotkevika 2013). (Figure 2)

Such a design guideline is specific about the spatial situations in which it is to be applied and a certain climatic zone in which it is to be used. Yet it still offers the designer the opportunity to shape his design. He or she is free to choose the species of trees or even to choose another construction to provide shade.

Such design guidelines grow out of a thorough analysis of the existing landscape. This analysis will show a typical situation that often occurs, which generates the same kind of issues for these situations. Design guidelines are then proto-typical solutions to solve the issues. For a design oriented training an obvious requirement for the student in his or her thesis is to work out the design principle and guideline into a design proper for at least one situation. What students seldom have time to do, but would be a requirement for serious academic research into design principles and guidelines is testing them in a number of new situations as to their applicability. The tricky issue in landscape design is that it is very hard to experiment and to see whether solutions actually work, given the money, effort and mostly time required to do 1:1 testing. In the PhD-thesis by Lenzholzer solutions have been put to the test using environmental simulation modelling (Lenzholzer 2010). Another issue is whether certain principles or guidelines are understandable for the landscape architects that need to apply them. This is currently being explored by Wiebke Klemm in her PhD-research.

Design guidelines as prototypes can be the linking pin between research phase (or more modestly the analysis phase) of a design process and the modelling and shaping phase. They can help students break the analysis-paralysis which sometimes occurs in the thesis-process. Zooming out design principles and guidelines could be the linking pin between

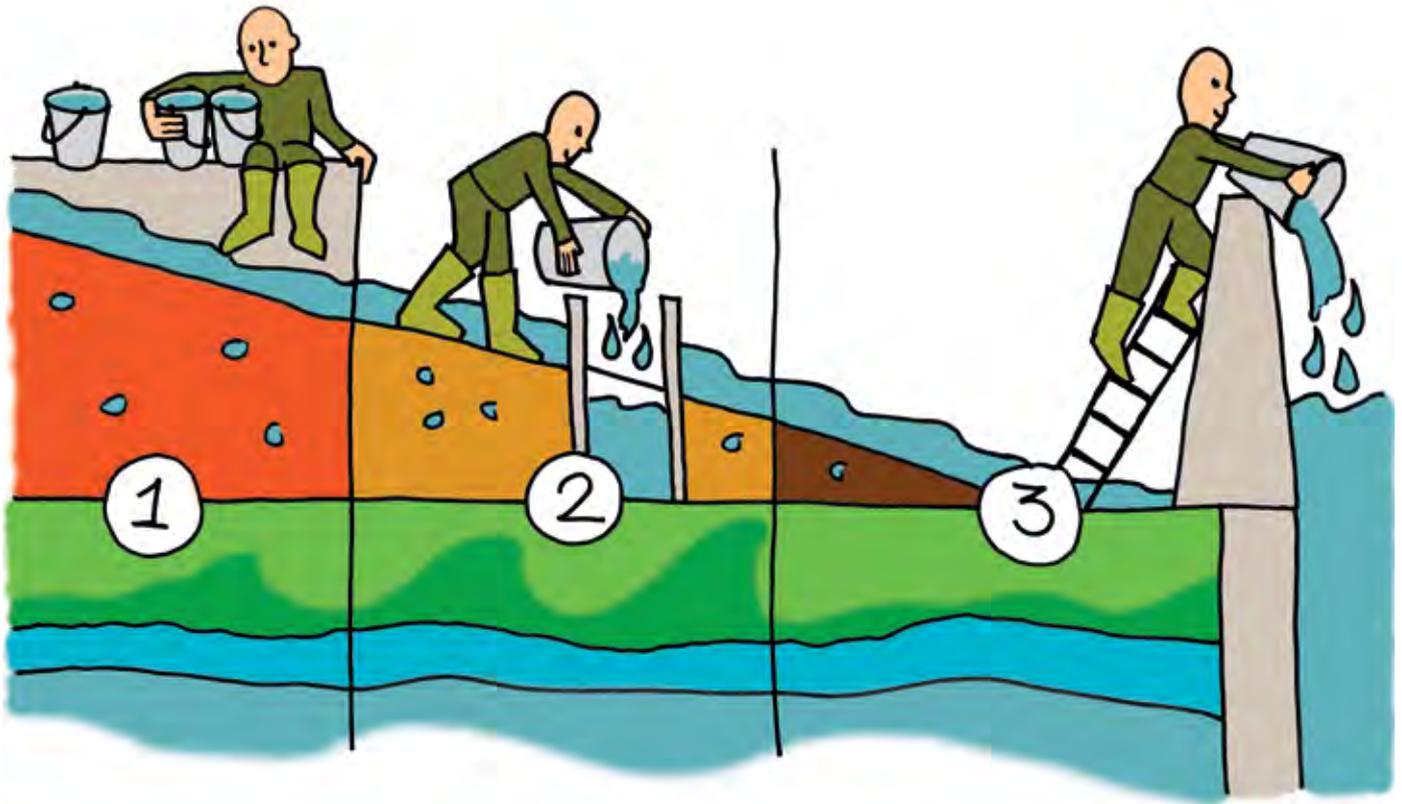


FIGURE 2. Design guidelines for mitigating urban heat

more research-oriented academic works on landscape and designerly oriented practical work in landscape architecture offices. For design principles and guidelines to bridge the gap between science and practice they need to be specific enough as to be usable but also general enough as to leave room for shaping. They should, like any recipe, come accompanied by the symptoms they can address and with a consideration of their side effects. For instance, the planting of trees to combat urban heat can also have the side effect to trap polluted air inside a street profile. Design principles and guidelines should on the other hand leave design professionals with enough room for other considerations that also influence the design proper. Design guidelines are thus less specific than design proper, which is location specific and is specific about the used materials, for instance the species of tree that is used to provide the shade.

Conclusions

Design guidelines are thus more specific than design principles, but less specific than individual design solutions for a specific location. They might thus bridge the gap between research and design. It is however doubtful whether well-developed design guidelines are the timesavers our students hope them to be. Specifically the requirement of testing them in different circumstances takes a lot of time. This could however be accommodated by splitting up the process across two students working subsequently on one such an issue. Design principles

and guidelines offer what Aristotle has described as phronesis, knowledge in the making (De Jonge 2008) and perhaps what Cross refers to as designerly ways of knowing (Cross 2007). But where design principles are technical translations of technical insights based in scientific knowledge, design guidelines are linked to a certain typology of applicable situations. As such the development of design principles and guidelines might possibly offer a way forward to increase the designerly content in academic journals, offering papers that are both academic and designerly.

References

- Cross, N., 2007. Designerly ways of knowing. Berlin: Birkhäuser verlag
- De Jonge, 2008. Landscape architecture between politics and science. PhD thesis Wageningen University
- Hamers, J., 2009. Wetlandscape, adaptation to climate change on the island of IJsselmonde. MSc-thesis Wageningen University
- Hotkevica, I., 2013. Green elements in street canyons, Research by design for heat mitigation and thermal comfort in urban areas. MSc-thesis Wageningen University
- Hua, X. and Liu, Z., 2012. Urban Stormwater Landscape: Improvement and Integration. MSc-thesis Wageningen University
- Lenzholzer, S., 2010. Designing atmospheres Research and design for thermal comfort in Dutch Urban Squares. PhD thesis Wageningen University
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Layered Landscape Design

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landscape design | cultural heritage | land art | education | student design

The central dilemma of historic landscape renewals are the right definition and restoration of the most important and characteristic time- and style-layers of the site. Only through the historical authenticity, through a sensitive, site-specific design intervention can the cultural value and the essence of the site be preserved and represented.

A diverse set of international perspectives from established theories in landscape design, environmental philosophy, geography, environmental history and sociology are working together to form new visions for the restoration that embraces social and ecological histories and values.

The paper presents design approaches concerning historical fidelity while also recognizing the role of human influences, the changing uses, and the importance of the visual impact and that of the artistic element in the perception and understanding of the site, in the enhancement of the proper layer of a historic landscape.

Contributions include theoretical design concepts presented by specific, case-based examples involving the students, in order to apply the theory to practice. The case studies are represented by examples belonging both to urban and rural environments, historic gardens and cemeteries, re-designed by students and teaching staff members together, according to valid, legal regulations.

The research-based and contemporary design approach, as part of the educational process at the Faculty of Landscape Architecture in Budapest, enhances creative and authentic design-visions of the students.

The renewal of historic gardens, landscapes and sites become more actual in Eastern and Central European regions. The Department of Garden Art of the Szent István University, Faculty of Landscape Architecture and Urban Design since 1963, has been dealing with landscape renewal on landscape, garden and settlement scale too, fitting the tasks in the running educational programmes, and involving the students in researches and design works related to the field. The more than 50 years' experience already proved the advantage of such teaching staff-student cooperation's, and the efficiency of the integration of living, real tasks in the educational process.

The purpose of this paper is to explore how good landscape design in historic environments is achieved. There is not one correct answer or approach of course, but there are ways of thinking and working. The historical value can not be simplified or be understood as the notion of „old”, the heritage being represented by the all-time valuable garden features and elements, independent from their formation in time.

Beside the historical authenticity the actual use, the frequently totally new functions, the ecological claims, the social needs and the sustainability are the most important aspects which must be integrated in the heritage protection and reclamation process.

Approaches and competencies used by the students were primarily related to the development of designer behavioural forms, in order to be able to find, to analyse and to use the existing historical data and the actual social background of the sites, converting all this information in design. During the brief presentation of the case studies in this paper I use the approach-denominations defined by Péter Balogh and Kristóf Fatsar (Balogh 2006) for different types of design approaches followed by the students in their works.



FIGURE 1. Masterplan of Szili Castle Garden, Biatorbagy (HU) – MSc design task/Detail
 Designers: Tóth Enikő, Tóth Evelin (Tutor: Albert Fekete, Anita Szabadies)

FIGURE 2. Masterplan of Wesselényi Castle Garden from Zsibó (Jibou, RO) – Diploma work/Detail
 Designer: György Zsigmond (Tutor: Albert Fekete)

Case A _The “Reconstructive Renewal” of Szili Castle Garden from Biatorbagy (HU)

During the design process the students used the not too many existing archival resources available, regarding to the baroque period of the castle garden.

According to the new type of uses (community house and conference centre) defined by the owner, the designers preserved the values of the garden, taking over the original garden layout and using specific plants for baroque period. Because of the lack of particular and detailed historic sources, the designers needed to inspire from analogies of Hungarian and European court d’honneur examples and to use contemporary materials to recall the former baroque garden’s atmosphere.

The example shows the difficulty of this approach in case we do not know every single original detail of the site which have to be renewed. (Figure 1)

Case B_ The “Recasting Renewal” of Wesselényi Castle Garden from Zsibó (Jibou, RO) - Detail

The students based their design on the baroque garden antecedents using particularly basic elements (shapes) of the layout. However there is also a very strange plant material use - fundamentally different for the baroque style and foreign for the local climate. The solution has been inspired by the new environment of the castle formed during the 20th century: a Botanical Garden with a substantial number of exotic species and several glasshouses built in a modern style next to the main façade of the old castle. Through the designed extroverted ‘parterres’, the authors tried to supply a stylish adaptation of the garden to the totally changed environment.

The design follow a clean and fair renewal of formal baroque parterres in front of the main castle building, preserving the fundamental historic space organization and layout. The new and unusual plant species borrow to the composition a fresh, contemporary air, without a denied of the historical authenticity. (Figure 2)



FIGURE 3. Masterplan of the Batthyány Square, Budapest (HU) – MSc design task/Detail
Designers: Krisztina Bálint, Fábíán Zsófia Rita (Tutor: Albert Fekete, G. Imola Tar, Máté Sárospataki)

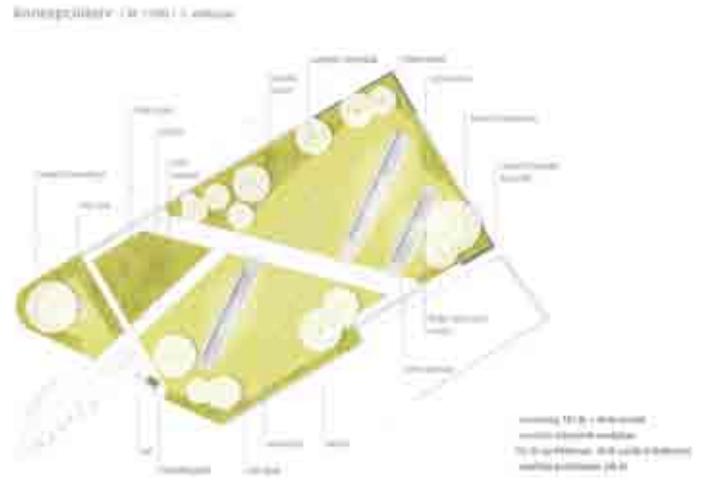


FIGURE 4. Masterplan of Érd Cemetery, (HU) – Department Design Work/Detail
Designers: Albert Fekete, Luca Hrabák, G. Imola Tar

Case C_ The “Recasting Renewal” of the Batthyány Square, Budapest (HU)

The authors, after a historic investigation of the square and district, decided that there is no answerable site for reconstruction. Looking after formal analogies and contemporary solutions they evoked the baroque parterres and pools on the square by a geometrical division (the main motif of the whole square), organizing the main axis of the composition on the main entrance of the St Anna church – the most representative built feature of the square; and the cross axis of the composition on the view of the Hungarian Parliament located on the opposite site of the Danube (which represents the eastern border of the Batthyány square).

The example shows how using certain basic elements of the original construction style’s, a creation with fundamentally different open space structure can be establish, preserving the main accents and highlighting the heritage values of the site. (Figure 3)

Case D_ The “Contrasting Renewal” of the Érd Cemetery

The design approach in this case is adequate when it does not recall the basic character of the site (because of lack of basic historical information, loss of initial area, etc) and does not wish to adapt to it. The loyalty to the creation’s period is consciously disassembled, the cemetery - located in a historic environment – not being a representing masterpiece of their age.

The result is a contemporary art work, very functional at the same time. The new, unique and particular element – represented in our case by the dominant, geometrical urn walls built by concrete – and the certain ratio of the grave parcels and open areas try to define good proportions, and a distinctive, memorable composition, with characteristic space structure and layout.

The example shows, that the need and expectation of the municipality in case of a cemetery renewal is to create a memorial park, which preserve primarily the historical context of the centuries not through formal, stylistic elements, rather through functional continuity and memories. (Figure 4)

New designs in historic settings will always generate debate. Our aim and aspiration during the educational process of the new landscape architecture generations is that all redesigned parks, gardens and squares must be to match the quality of the new with the old, with the authentic; so that they are respected and enhanced for the benefit of those who visit and come to enjoy this wonderful green heritage.

References

- Balogh, P. I., 2006. Szabadtér-tervezés történeti környezetben (Open Space Design in Urban Historic environment). 4D Tájépítészeti és Kertművészeti Folyóirat, 2006/3. 38-44.
- Eplényi, A., 2015. „Garden-fragments”. Garden Design and Historical Landscape Heritage in Calata Region. Transsylvania Nostra Journal. Year IX, 33rd Issue, 20-32.
- Ingram, M., 2015. Material Transformations: Urban Art and Environmental Justice. In: Hourdequin Marion and Havlick, D. G. Restoring Layered Landscapes. Oxford: University Press, 2015. Chapter 12.
- Sárospataki, M. 2014. Vallató Bath and Mofetta. In: Jakab, Cs. and Márton L. A. Építés/Building. La Biennale di Venezia. Debrecen: Alföldi Nyomda Zrt. 86-87.
- Historic Scotland, 2010: New Design in Historic Settings. Architecture+Design Scotland. The Scottish Government. Glasgow

Impact of Historical Zoos on Space Structure, Function and Infrastructure of Urban Public Parks

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historical zoos | public park | space structure

The aim of the research is to define and evaluate the bilateral impacts of first zoo developments and the urban parks where the new institutions were located in. Through historical, structural, functional, ecological analyses and park user's interviews we highlight the impacts of zoos on the related public parks' on the example of the Budapest Zoo and the Városliget. First we clarify the positive and negative impacts of zoos on public parks, than the possibilities of a better cohabitation. Bridging the gap between the institutional and the public functions is an urgent issue in urban landscape architecture, as historical zoos have to face the necessity of overall renewal owing to the contemporary tasks and trends of zoo development and design.

Development, planning and design of zoos should minimize the future impacts on adjacent parks by treating the entrance positions well and developing the visual connections with the public parks.

Introduction

Animal collections have gone through great changes during their history, this has always been related to current social values and relations to the environment (as established on domestication, hunting, religious, cultic, aesthetic, amusement, education, scientific and conservation purposes). There are several forms and definitions for zoos and they include a variety of facilities (Kisling 2001). According to the Conservation Breeding Specialist Group, a zoo is an institution, where species of mainly wild animals are kept and accessible public observation of at least a part of the collection is offered during a significant time period (CBSG 1994). But the main points in zoological gardens are the scientific, educational and conservation objectives (Graeth 1995).

The first zoos were closely related to the establishment of public parks. A few decades after the beginning of the European urban park developments "the public no longer found relaxing naturalistic environments sufficient for recreation." Zoological gardens were integrated into public parks, "producing more compatible solutions, but at times subverting the real value of a large park." (Pregill, Volkman 1993) The first zoo appeared in London's Regents' Park in 1828 which catalyzed the development of zoo gardens in the heart of urban parks in European and North-American cities in the 19th century (Figure 1). These interventions into the structure of existing public parks caused irreversible impacts on the original spatial structure, the functional supply and the whole infrastructure. The benefits and the drawbacks of this linkage are highlighted by studying previous historical, space structural, ecological and park users' researches of the Városliget urban park and the Budapest Zoo therein.

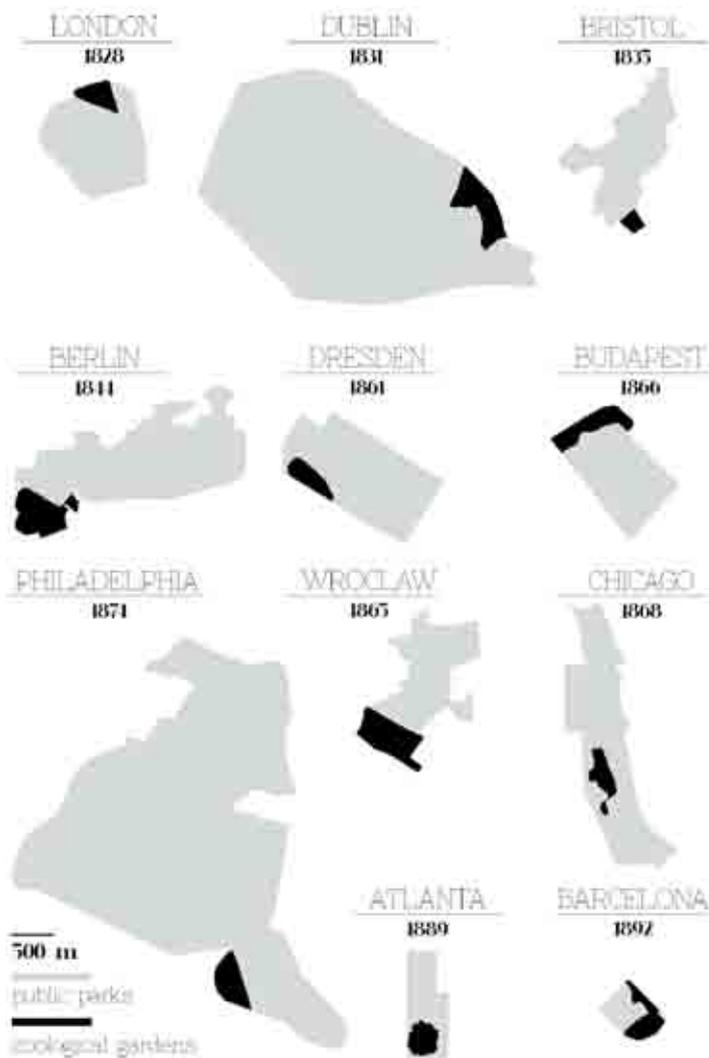


FIGURE 1. Location and proportion of the first zoological gardens within urban public parks.

Description of the Research

The Budapest Zoo was established by the recognized scientist, János Xantus in the northern part of the first urban park, the Városliget in 1866 (Szidainé 1991). Although there was plenty of undeveloped area close to Pest city, the development of the zoological garden utilized an 18 hectare area out of a 109 hectare large public park (Jámbor 2015). The Városliget was planned by a German landscape architect, Heinrich Christian Nebbien in 1816 as the very first public park in Europe. As an extension of the park's functional supply the zoo was set next to the railway lines built in 1846. The new institution was followed by several further entertainment facilities (the Grand Circus, restaurants, side-shows, amusement park), therefore the infrastructure had to be improved in the previously wild, freely shaped generous open spaces. The introduction of a new urban boulevard – Állatkerti Boulevard – along the border of the zoo was an initial impetus for further fragmentation of the grandiose open lawns and picturesque vistas (Zelenák 2015).

Unfortunately this fragmentation tendency still exists in the Városliget (Figure 2). Owing to the urban development and the heavy car traffic, nowadays the lack of parking places nearby the zoo is a handicap (Figure 3). The traffic and parking burdens destroy the landscape values of the park along the Állatkerti Boulevard. Since both visitor entrances face directly to the park, visitors arrive and leave through the park, and this pedestrian traffic gives additional loads to the regular and strong park use. In spite of the negative effects of the zoo's location, it fosters the social-sanitary function of the park, by adding to its recreational and social values.

From an urban ecological point of view, the zoo though detached from the park's area with its functionality and accessibility, can still be considered as a coherent ecological unit. The urban heat island analysis (Gábor 2008) shows the temperature reduction of biological active surfaces of the zoo are significant, almost identical to the values of the Városliget. This phenomenon can be explained by mature vegetation and great water surfaces both in the park and the zoo which create a good local climate (Szilágyi 2014).

VÁROSLIGET

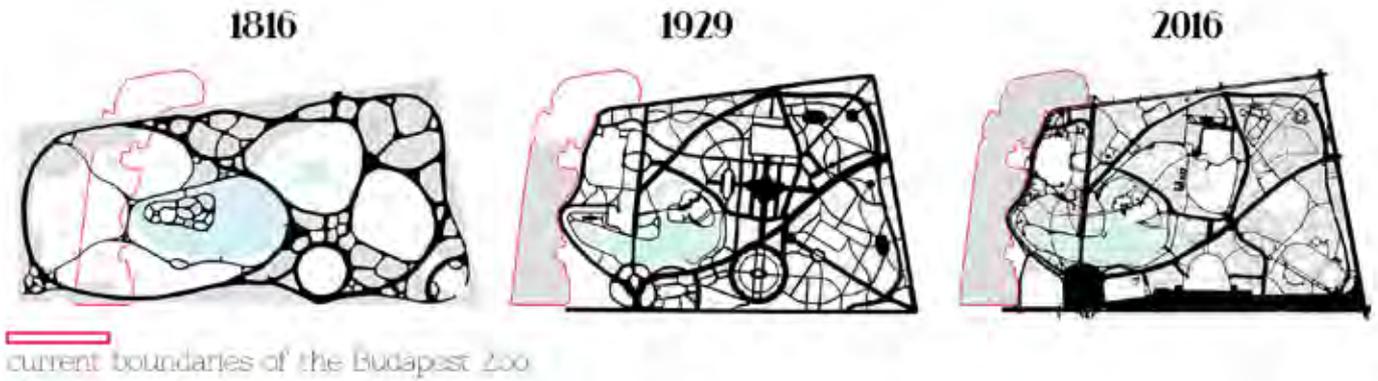


FIGURE 2. The space structure of the Városliget according to Nebbien's plan (1816), the accelerating fragmentation of the park 64 years after opening of the zoo (1929) and current space proportions after the zoo was expanded.



FIGURE 3. Vegetation coverage and parking places of the zoo and the public park.

According to an online visitor survey carried out in 2014, a remarkable number of park users mentioned the visit of Budapest Zoo as their first memory of the Városliget (Szilagyi 2014). Another visitor survey (Fekete 2012) underpins the zoo's cultural and recreational value in the public park, since 48% of the respondents' main destination in the Városliget was directly the zoo.

These benefits are closely related to the location of the zoo in the park: it was positioned in a less sensible border area, beside the railway lines. This beneficial border position can be observed in most zoological gardens established in the 19th century. The question is how to bridge the gap between the public parks and zoos.

By repositioning zoo entrances facing to the urban fabric and visually connecting it with the public park on their common edge, the infrastructural burden of the zoo could be eased, and the gap caused by the unfavourable fragmentation reduced.

The relation between public parks and zoos can be utilized with new connections of multiple levels. By functionally closing and visually opening the common edge, the infrastructural burden on the parks could be eased and the gap caused by the unfavourable fragmentation could be narrowed. The cooperation of the Copenhagen Zoo and Frederiksberg Garden is a progressive example for establishing this visual connection. While walking on the southern part of Frederiksberg Garden visitors may have the impression that they suddenly entered the zoo, while a breath-taking view opens up into the Asian elephant enclosure. Visually, the zoo integrates the park and offers the illusion that the park is also a part of the elephant enclosure (Figure 4). This generous gesture was conceived in the spirit of the contemporary zoo design trends, in 2008. As a response for the modern zoos' objectives, new design principles have spread worldwide as a tool to emphasize the importance of nature conservation. Creation of naturalistic enclosures to represent specific natural habitats and involvement of visitors as guest in these habitats are the main concept of the immersion design (Fekete 2015). The view of the enclosures is precisely designed from one or two specific viewpoints with visual



FIGURE 4. Visual connection between the elephant enclosure of the Copenhagen Zoo and Frederiksberg Garden. (photo: Fekete, O. 2010)

connection among species living together in the displayed habitats. Not only this intent, but also the path systems and the designated sequences of spatial experiences have a close relation to the design concept of John Nash, Heinrich Nebbien or Frederick Law Olmstead, the great public park designers.

References

- CBSG (1994): Nature conservation world strategy of zoos, FÁNK, Budapest pp. 3
- Fekete O., Reith A., (2012): Park usage past and present of the Városliget, Landscape Architecture Faculty of Corvinus University of Budapest, Budapest
- Fekete O. (2015): ZOO DESIGN – Micro-scapes and biodiversity, the master plan of Sóstó Zoo, 4D Journal of Landscape Architecture and Garden Art, No. 38 pp. 34-47
- Gábor, P., Jombach S. (2008): A zöldfelület intenzitás és a városi hősziget jelenségének összefüggései Budapesten. (The relation between the intensity of green space and the urban heat island phenomenon in Budapest.) Falu, Város, Régió 1. Városi zöldfelületek, 31-36.
- Graeth, M. (1995): The Role of Architectural Design in Promoting the Social Objectives of Zoos - A Study of Zoo Exhibit Design with Reference to Selected Exhibits in Singapore Zoological Gardens, Dissertation, National University of Singapore
- Jámbor I. (2015): The City Park of NEBBIEN – The Public Garden of Pest is 200 years old, Transylvania Nostra 2015/1. 48-54.
- N. Kislíng V. Jr. (2001): Zoo and Aquarium History: Ancient Animal Collections To Zoological Gardens. Taylor and Francis Group, Boca Raton, (ISBN 9780849321009) FL USA
- Pregill P., Volkman N. (1993): Landscapes in History: Design and Planning in the Western Tradition, (ISBN: 978-0-471-29328-6) New York pp. 568-569
- Szidnainé Dr. Csete Á. (1991): A 125 éves Budapesti Állat- és Növénykert Története (The history of the 125 years old Budapest Zoo), Budapest pp. 7-16, 19, 39-40
- Szilágyi K.; Zelenák F.; et al. (2014): Limits of ecological load in public parks – on the example of Városliget APPLIED Ecology and Environmental Research (ISSN: 1589-1623) (eISSN: 1785-0037) 13: (2) pp. 427-448.
- Zelenák F., Szilágyi K. and Fekete O. (2015): Space structure and open space recreation in time dimensions (under publishing), Cracow University of Technology, Dep. of Gardens Art and Green Areas, Cracow

Bridging the Gap Between Landscape Architecture and Ecology in Teaching and Design Practice

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biodiversity | ecological design | interdisciplinarity | sustainability | holistic approach

In a time of ecological crisis and on a man-made planet landscape architects are faced with major new challenges. We discuss growing experiences at the Department of Landscape Architecture at HSR in Rapperswil when preparing Bachelor and Master students in landscape architecture with these novel challenges of their profession at all levels of the curriculum: (1) basics in natural sciences, (2) design classes, (3) history and theory of landscape architecture, (4) interdisciplinary classes co-taught by landscape architects and ecologists, and (5) student projects.

Introduction

A rapidly growing part of global land area is – directly or indirectly – shaped by humans (Kueffer 2013), and an increasingly larger proportion of such anthropogenic land is peri-urban or urban, i.e. the spaces where landscape architects primarily work and where their work has a major impact on the environment in general and biodiversity in particular. At the same time, qualities of nature are rapidly disappearing (Kueffer 2016), e.g. global biodiversity, particularly species-rich and spatially extensive ecosystems, ecosystem services – such as climate regulation, clean water catchments, or pollination, and nature experiences especially of urban populations. Landscape architects have a growing responsibility to contribute to the restoration and resurrection of biodiversity and vital ecological functions of healthy ecosystems, including resilience to environmental changes (e.g., climate change, soil degradation, air pollution and its damaging consequences). Equally, landscape architects are faced with a growing need to provide people with nature experiences, especially in urban areas.

The Vital Importance of Ecology for Landscape Architecture in the Anthropocene

Ecology, the knowledge about the interactions among species and the relationships between species and their abiotic environment, has always been an indispensable part of a landscape architect's competences. In the Anthropocene, some ecological dimensions of landscape architecture gain in importance while new ones emerge. Considering the growing conditions (climate, soil) under which a particular plant species proliferates is the basis of any good gardening practice. Due to rapidly changing environmental conditions this becomes more challenging. It will in the future not suffice to rely on long-term practical experience from a place; rather predictions of future conditions must be taken into consideration and new plant species used that are adapted to these future environments.



FIGURE 1. Arguably the most important role of landscape architects today is to re-establish the lost bonds between humans and nature. (Eva Maria Schilling, Bachelor thesis at Department of Landscape Architecture, HSR Rapperswil)

This requires a deeper understanding of a plant's physiology. In particular, water scarcity will in many places in the future make clever water system designs and the use of appropriate plants will be the core of any good landscape architecture.

Because of new demands for ecosystem services of designed green spaces, new ecological aspects enter the profession. Demands for carbon sequestration, (urban) climate regulation, long-term soil fertility (based on minimal external inputs of nutrients), or ecological connectivity (enabling the gene flow between isolated populations of rare species) can only be met through consciously designing these ecological functions, which must be based on ecological thinking. Then there is the hope that green space can contribute to averting an imminent biodiversity crisis (which might lead to the loss of >75% of global biodiversity), including restoring species interactions between animals and plants such as pollination.

Lastly, in a time of rapid environmental change and a growing frequency and magnitude of extreme events green spaces must foremost be designed for resilience. If there is one general strategy to achieve this, it is to increase diversity at all biological levels. Whether native or non-native species are used, genetic, species, functional and habitat diversity must be increased. In other words, plant material should not all be sourced from the same supplier (or *in extremis* mother plant), many different forb or tree species must be intermixed in planting designs, and these species should be ecologically diverse, and form diverse plant assemblies. Only through such diversity is a green space somewhat insured against the vagaries of an uncertain climate and fluctuations of other environmental conditions. In short, the Anthropocene forces landscape architects to (1) consider ecological functioning and biodiversity in all design

practices, and (2) design green spaces not only for aesthetical purposes but to maintain and restore ecological functions. As a consequence, thorough teaching of ecological thinking becomes an ever more important part of a landscape architecture curriculum.

Bridging the Gap between Landscape Architecture and Ecology in Teaching

Combining good design with fostering biodiversity is a comparatively young goal in landscape architecture. The "Naturgartenbewegung" (Loebbecke 2013) focused mainly on native plant use and an aesthetic of natural-looking gardens and parks. With postmodernism and the introduction of more complex design strategies in the 1980s, combinations of wild vegetation and straight lines were appreciated for the first time. Dieter Kienast, a former professor of design at HSR Rapperswil, was one of the first professionals to exploit the great visual potential of contrasting geometric lines with freely growing plants (Freitag 2016).

At the Department of Landscape Architecture at HSR in Rapperswil we are returning to this line of thought and are gaining novel experiences with preparing Bachelor and Master students in landscape architecture to the ecological challenges of their profession at all levels of the curriculum. The teaching of natural sciences – ranging from general botany and soil sciences to ecology and vegetation science – builds the basis for later interdisciplinary classes and student projects co-supervised by landscape architects and ecologists. Classes in natural sciences are strongly oriented towards practical problems, e.g. the lecture on the physiology of water uptake and use is coupled with an introduction of the role of transpiration for cooling of urban climates, or urban soils play an important



FIGURE 2. The 'orderly frames' design strategy: Integrating 'wild', 'unstructured' or 'arbitrary looking' biodiversity elements into an overall compelling design concept by framing or contrasting it with powerful design elements such as sharp borders. (Benjamin Wellig, Term project in design at Department of Landscape Architecture, HSR Rapperswil)

role in the soil science class. However, emphasis is also given to a thorough conceptual understanding of the sciences beyond their immediate applicability, especially in plant systematics and vegetation science. These topics are taught mainly as outdoors classes, and the idea is that students learn the necessary tools for identifying wild plants and vegetation types and understanding their ecologies. We don't only teach plants for immediate use to garden design because we think that only landscape architects with a broad overview of wild plant diversity can use wild plants and landscapes as a continued source of inspiration, both aesthetically and ecologically. Advanced courses treat ecological design topics such as green corridors, nature-based solutions for cooling urban climates, plant coexistence and design of diverse plant assemblages, or the full range of nature conservation solutions from protected areas to multi-purpose agricultural landscapes and nature design strategies such as biodiverse rooftops, re-wilding or assisted migration (Kueffer 2016).

Teaching in design classes and theory of landscape architecture are of equal importance for enabling new bonds between design and ecology. Only through a thorough knowledge of how landscape architecture conceptualised the relationships between the natural and the artificial, the garden and the wild, or the autochthonous and the novel in different historical contexts, can students reframe these tensions for our time and thereby contribute to a societal process of rethinking the relationship between humans and non-human life. Ultimately this might help to re-establish the lost bonds between humans and nature; arguably the most important role of landscape architects today (Figure 1).

In design classes and projects co-taught by landscape architects and ecologists, students explore how to adapt designs so that they better contribute to providing ecosystem services or maintaining biodiversity. Design strategies are innovated to help to integrate aesthetically 'wild', 'unstructured' or 'arbitrary looking' green elements into an overall strong visual and symbolically meaningful appearance (Gadiant and Stapfer 2016). Possible strategies are for instance that of 'orderly frames' where a piece of ruderal vegetation, unmaintained hedge, or a remnant group of trees is integrated into an overall compelling design concept by framing or contrasting it with powerful design elements such as sharp borders, prominently placed lines and perspectives, or dominant artificial elements that provide a strong contrast (Figure 2). Another strategy is that of 'citation' where a piece of 'wild nature' is recreated in miniature evoking reminiscences of the original. A third strategy is to re-design natural vegetation in a new context and with a clear visual strategy in mind, as exemplified by the work of naturalistic Dutch garden designers such as Piet Oudolf or Henk Gerritsen. It might also be that the accidental and disorderly will gain new appreciation of itself in urban spaces that are increasingly lacking under-determined space.

At HSR Rapperswil we are still in an early phase of learning how to bridge landscape architecture and ecology, but our first experiences show that students greatly appreciate the merging of good contemporary design with fostering biodiversity and ecosystem services.

References

- Freytag, A. 2016. Dieter Kienast. Stadt und Landschaft lesbar machen. gta Verlag, Zürich: 184-236.
- Gadient, H.; Stapfer, A. 2016. Biodiversität und Gestaltung verbinden. Hotspot (Forum Biodiversität Schweiz) 33/2016: 18-19.
- Kueffer, C. 2016. Biodiversität wagen. Neue Ansätze für den Naturschutz im Zeitalter des Anthropozäns. In: ILF (ed.). Landschafts- und Freiraumqualität im urbanen und periurbanen Raum. Bern: Haupt, 74-87.
- Kueffer, C. 2013. Ökologische Neuartigkeit: die Ökologie des Anthropozäns. ZiF-Mitteilungen 1/2013:21-30.
- Loebbecke, A. 2013. Über Naturgärten. Dissertation. Fakultät für Architektur, TU München, Deutschland.

The Changing History of Klastromrét: One of the Emblematic Sites in Baia Mare

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baia mare painting | Klastromrét | open space changing |
genius loci | landscape approach

Famous for its school, which was founded at the end of the 19th century, Baia Mare is located in the north-western part of Romania on the banks of the river Zazar. It is a municipality in Maramures country.

Over time, painting in Baia Mare developed a style unique in European art. Thanks to the inspiring power of this rich landscape, the work embodies a love of nature, purple, azurite and emerald shades. Georeferencing and categorizing - by time and site - the results of more than 100 years of picturesque works, we have uncovered the city's image and character-defining elements. One of the most painted locations is the Klastromrét (Klastrom meadow GB, Câmpul Tineretului RO). This wide-open area, which was once on the outskirts, now forms the heart of the city. The trait of this premise is interesting: it played a major role in the viewpoint of urban space changes, in the history of the artist community, in the family, the wider community and art. Many plain-air paintings were born in this place: from the north, the famous mountain wreath, and from the south, the city's iconic towers unfold for the viewer.

The fate of the Klastromrét is an interesting development: in the course of its history it has needed protection: on more than one occasion painters and citizens have fought against the building-up or subdivision of this area. However, the genius loci can be still traced today, and it is a key area from the perspective of both cityscape and city life.

My work presents the changes in the sites of Baia Mare painting with reference to the changes in picturesque vision and landscape approach. It emphasises the historical overview of Klastromrét, and the current situation within this constantly changing space.

The characteristics of the town are defined by 18th century buildings: schools, churches; in the 19th century the current image of the city centre was established, where aristocrats from the surrounding areas built bourgeois houses, in many cases on 15-16th century foundations. Thanks to 20th century town-planning, Baia Mare has become a more and more cultured and welcoming city. As a result of the railway, built in the 19th century, the industrial and social life of the town was revived.

The Klastromrét (the meaning of klastrom in Hungarian is: monastery, convent) is one of the most emblematic locations of the city. Over the centuries, the meadow (pasture) was turned into the open-air space of the increasingly sprawling city. Because of its location it became the favourite spot for painters, as the emblematic mountain range surrounding the city from the North, North-east can be seen from here, and also elements of architecture defining the image of the town from the South. The picturesque scenery was further intensified by the purple sea of autumn crocuses (*Colchicum autumnale*), that once adorned it. "The painter, who came to Baia Mare, somewhere here, around the Klastromrét started to sense the beauty of artistic elements and the painter strolled along the marketplace, the Bridge Street, and over the River Zazar the amazing splendour of the field awaited. Everything was close by." (Murádin 1990)

Many compared it to Arnold Böcklin's painting, Flora (Murádin, Szücs 2014). Elements that over the centuries came to define the identity of Baia Mare. In the past century it was normal to see art students with easels on the Klastromrét, trying to encapsulate as much as possible in their paintings from the magnificent sight in front of their eyes. Working in the style of the Munich School, the painters in Baia Mare gradually switched to a natural, but not naturalistic approach, with a



FIGURE 1. The general view of Klastromrét from April 2016. (the author's photo)

distinctive style developed in Baia Mare, with a modernist use of colours.

Due to its exposure and size it has been a constant target of urbanization. Its legal status and owners having changed several times over the years.

It is neighboured by a wooded area, the central part of today's Grove, which was later turned into a civic park. The Klastromrét was a place for picnics for the inhabitants of Baia Mare.

Before 1900, the meadow was owned by the Reformed Church, the Convent of Franciscans (Minorities) and partly by private owners. After 1900, fearing the threat of buildings in the area, the part of the Reformed Church was purchased by the city thanks to its citizens (for 22000 coronas); regulations prohibited building on site, considering its conservation value. "And what became the biggest gain, the Minister of Public Works approved on October 14, 1931 under decision no. 62922 the urban regulation, article 46 of which stated that in the area of the Klastromrét meadow up until the margins of the Greek Catholic cemetery, no constructions can be carried out!" (Murádin 1990)

The autumn of 1934 saw an increase in constructions in Baia Mare, and the Klastromrét was considered an ideal location for office clerk housing and villas. As a result of external pressure, Lajos Mladeioszky, citizen of Baia Mare, parcelled out and sold his part of the land, which became the property of 13 new land owners. The fight for building permits lasted for four years, between 1934 and 1938. Both the inhabitants of the town and the leaders of the painting school fought against building on the site, the trial of the meadow was the first action that considered the changes in the image of the town, mobilizing the public as well. The meadow was saved by the fact that it had been declared a climatic space (due to its climatic and recreational nature, the mineral water wells in the city and in the areas nearby, as well as the special climate), which - in accordance with national legislation on therapeutic areas - meant that its natural values needed to be preserved and protected, and as such, constructing houses was not possible on it.

The high profile determination to save the green area, supported by the media in 1937, reflects the fact that the function of the space was determined by the ones who used it, and it also illustrates the way in which a picturesque landscape can become part of the historical past of the city.

Unfortunately, the Klastromrét has become the victim of construction and inappropriate interventions, and its area is constantly shrinking.

- In 1890 the city stadium was relocated here.
- Between the two World Wars constructions on the areas between the Grove (urban park) and the Klastromrét developed into a street.
- At the end of the 1920s, a sports field was established.
- In the 1950s, in the South-Eastern part of the town a beach was built.
- Between 1957 and 1958 the summer theatre featuring Greek columns was built, currently it is the location of the Ethnographic and Folk Museum.
- In 1959 the oversized liberation monument of Andrei Oștap was erected at the entrance on the side of the city (Figure 1).
- In the 1970s the sports field was surrounded by concrete bleachers and it has grown into a battery.
- In 2012 the tender for the rehabilitation of the Klastromrét was announced, in 2014 construction work of the winning application started with a new image, which - due to the inappropriate approach, the old trees were cut down, the attention was directed to the Ethnographic Museum - further maims the original character and function of the place. The extensive field area was transformed into an intensive one, with the added new functions, as a result, it lost the old character.

The green spaces of Baia Mare have always been formed according to current fashion and the financial possibilities of the city, as well as the requirements of the historical era, the present-day situation and progress have yet again become the victim of fashion, ignoring the historical values and picturesque elements of the city. This process leads to uniformity (Figure 2). An example for this is the emblematic location of the city, the Klastromrét.

Across Transylvania we can see evidence of the mishandling and incorrect approaches to urban open spaces. The Klastromrét meadow is a characteristic type of urban green area, one of the increasingly rare ones thanks to urbanisation processes. This meadow was able to preserve its natural and close to nature feature for a long time in the urban fabric of the town.



FIGURE 2. The general view of Klastromrét from April 2016. (the author's photo)

References

- Metz, J.- Klacsmányi, S.- Dávid, L., 2014. Séta Nagybánya utcáin. In: L. Dávid, S. Klacsmányi, J. Metz, K. Oszóczy, L. Soltz, eds. Nagybánya és környéke, Vol. 3. Nagybánya: Bertoti Péter, 2014, 101-163.
- Murádin, J., 1990. A Klastromrét pere. *Művelődés*, 39 (4-5), 41-44.
- Murádin, J.- Szücs, Gy., 2014. Genius loci. Budapest: Demax Művek, 2014, 78-83.
- Oszóczy, K.- Balogh, B., 2014. Nagybánya rövid története. In: L. Dávid, S. Klacsmányi, J. Metz, K. Oszóczy, L. Soltz, eds. Nagybánya és környéke, Vol. 3. Nagybánya: Bertoti Péter, 2014, 31-52.
- Toorn, M. van der, 2014. The future of urban parks in Europe; the role of landscape architecture in design and research. *4D Journal of Landscape Architecture and Garden Art*, 33, 2-19

Bridging the Gap Between Expertise and Engagement: an Exploration of Elegance and Design Process

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elegance | landscape architecture | design |
communities | expertise

Relationships between design expertise in landscape architecture, community participation in public space design, and design outcomes are investigated. Tensions exist between a search for design elegance and the need for transparent and inclusive participatory processes. A theoretical framework is developed and a case study investigation introduced, based upon post-earthquake reconstruction in Christchurch New Zealand. Preliminary insights are presented.

Introduction

While much is understood about community involvement in public space design, little research has been undertaken on the relationship between participation procedures and the application of landscape architect's design expertise (Hare & Nielson 2003). This is surprising, since landscape architects are interested in relationships between people and place, and in generating new possibilities for community transformation through design (Thompson 2000). Skilled design can help create elegant design outcomes, but public involvement focuses upon appropriate process and inclusion. How can landscape architecture expertise engage with the public to achieve both inclusive and elegant design outcomes? A theoretical framework is presented which investigates relationships between design expertise, public involvement and elegance in order to better understand the aspirations, values and modes of thinking that designers and communities each bring to the design of public space.

Values in Landscape Architecture

Landscape architect's design decisions stem from three main value areas; environmental, social, and aesthetic (Thompson 2000). Thompson's model (Figure 1) provides a useful framework for landscape criticism and for examining creative tensions that emerge in the landscape architect's design process. Accordingly, the most highly valued designs are those that maximize and integrate all three values in landscape architecture. However, elegance in design is more than integration – it involves a deeper level of synthesis to a point where nothing can be added or omitted without devaluing the design.

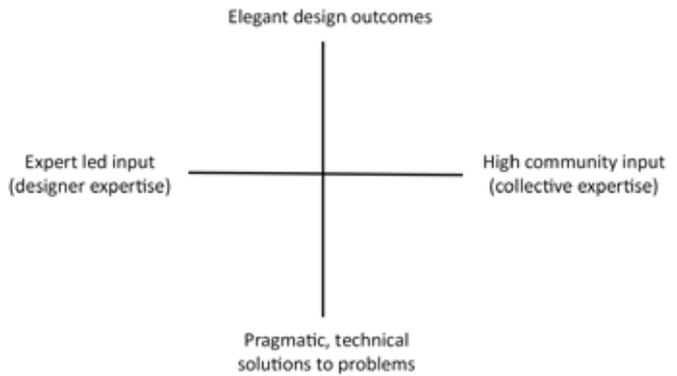
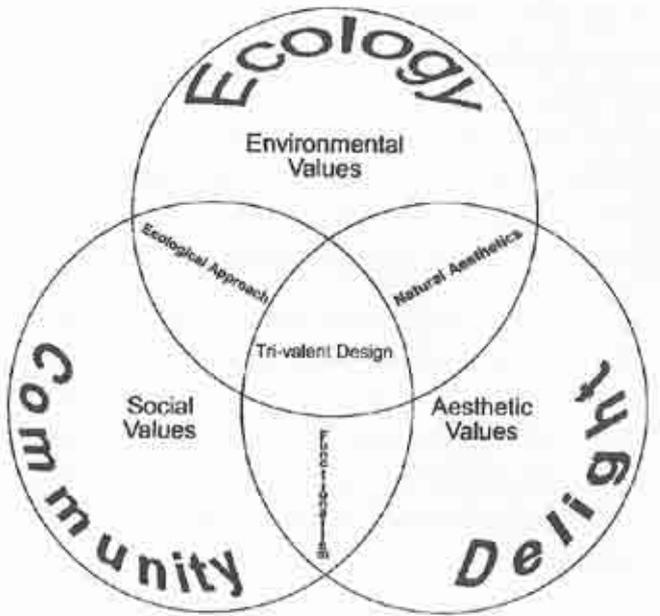


FIGURE 1. Overlapping value fields in landscape architecture. (Thompson, 2000, p.7)

FIGURE 2. Theoretical framework to consider the relationships between elegance, design process and participation.

Elegance

A closer look at the origins of elegance indicates its association with a kind of editing. Eleganteum in the original Latin means, to “select with care [or] choose” (<http://www.etymonline.com/index.php?term=elegant>). Such selection within a design context points to refinement, cohesion and legibility. Architect Patrik Schumacher (2007, p. 35) noted that “elegance signifies the capacity to articulate complex life-processes in a way that can maintain overall comprehension, legibility and continuous orientation with the composition.” Elegance thus evokes a human and experiential quality. As Goldblatt (2007, p. 12) explained, elegance is “part of a conceptual network that includes the likes of graceful, delicate, refined and balanced – what philosophers call aesthetic qualities, properties that are moving for the receptive subject.” Elegance takes integration beyond the potential for a functional but possibly uninteresting outcome, to a higher point of resolution that is unable to be improved upon as a holistic human response. It is not just a solution to a problem. Elegant outcomes are the result of design expertise that transcends problem solving through careful aesthetic and rational editing of options, to draw a complex set of relationships into a sophisticated, timeless and powerful response.

Elegance & Design Expertise

The selection process that creates elegance has several dimensions. First, elegant design proposals typically result from establishing “structures of thinking which produce cohesive relationships among elements” (Plowright 2014, p. 35). In contrast to problem solving, design typically responds to a ‘situation’ or ‘context’, transcending the isolated problem to “refine(s) a complex network of social, cultural and technological factors to provide quality as part of the human ecosystem” (Plowright 2014, p.27). Through careful selection, the designer identifies certain aspects to include in a design

resolution and others to leave out, thus ‘framing’ the design challenge.

Second, design uses trial and error to explore a problem, often reframing the inquiry towards design resolution (Cross 2011). This allows designers to better understand complex relationships, aspects of which initially appear unrelated yet when reframed prove interrelated, providing inspiration for innovative outcomes (Lawson & Dorst 2009). This reframing reveals unexpected resolutions to what are often unpredictable, vague and ill-defined problems.

Third, the processes and knowledge acquired by designers to address complex situations have been found to develop implicitly, typically through the learning and practice environments of design studios (Rowe 1987; Lawson & Dorst 2009). The methods of experienced designers often lack visibility however, and solutions appear from seemingly unstructured processes that draw upon the practical wisdom of the designers (Flyvbjerg 2001), as well as more formal analyses.

Design Expertise & Participatory Process

A key part of design expertise therefore involves structuring the design problem differently to that of a conventional problem solving approach. Design methods typically filter community feedback (along with other inputs) to address the complexity of a project, and are not confined to solving isolated problems. This poses potential tensions for the designer’s relationship with participatory process, which requires transparency and inclusion. To what extent then is elegant design resolution tied to the approach? Is elegance achieved only through design expertise, or can it come from expertise deployed within participative contexts?



FIGURE 3. Albion Square in Lyttelton, Christchurch, New Zealand.

The distinctive feature of participatory processes is that they are openly and inclusively deliberative, with priorities set by input from communities and stakeholders following a rational and explicit problem solving process (Plowright 2014). Good participatory process integrates the “interests, histories, and needs of marginalized citizens; to stimulate aesthetic engagement; and/or to activate citizens’ direct involvement in the development and life of renewed city spaces” Hirsch (2014, p. 174). In contrast, as noted above, the design process is an exploratory, critical process (Plowright 2014). The designer’s natural way of working is therefore not always easily understood or aligned with participatory process. Indeed, Roe and Rowe (2007) have argued that the nature of participatory process can compromise both landscape quality and design considerations as consensus based decision making takes precedence over resolving design problems.

Bridging the Gap

In order to understand the dynamics of the designer/ community relationship, this paper proposes a model by which to consider the intersection of elegance, design process and participation (Figure 2).

The horizontal ‘x’ axis left to right shows that design expertise can range from situations where expert designers operate in a solitary manner with little or no public involvement, to design where transparent and community process is paramount. Possible design outcomes are shown on the vertical ‘y’ axis and range from elegance to basic problem solving. This framework allows analysis of the work of the landscape architect and has potential to offer insights into how different processes influence the degree of elegance in the design outcome.

The Case Study

The case through which this investigation is undertaken is Albion Square in Lyttelton, one of the first urban public space projects designed and constructed in post-earthquake Christchurch since the devastating earthquakes of 2010 and 2011 (Figure 3).

The scale of change within Christchurch’s urban environment has highlighted the role of design expertise, whilst social disruption has created a need for strengthening communities in an inclusive way. Current doctoral fieldwork adopts an interpretive approach, using semi-structured interviews and participant observation to explore the dynamics of the designer/ community relationship.

Using the theoretical framework discussed in this paper and the preliminary results of current fieldwork, Albion Square could be positioned in the lower right quadrant of the model (Figure 4).

Landscape architects were an important part of the project team, however engagement was facilitated and directed by council consultation leaders. As one respondent noted, “throughout the process everybody had wish-lists about what they wanted to see there and the council designers to their credit managed to squeeze every single thing that people wanted into this tiny wee space in a way that although cluttered, it’s actually not too bad.” Landscape architects were not only constrained in their direct engagement with the community, but the application of their design expertise was shaped by the values and timeframes of project management processes. This meant limited opportunity to reframe or edit; practices that are fundamental to addressing the wider complexities of spatial design (Cross 2011). Formal design review by local landscape architects identified that legibility had been sacrificed for a “collection of

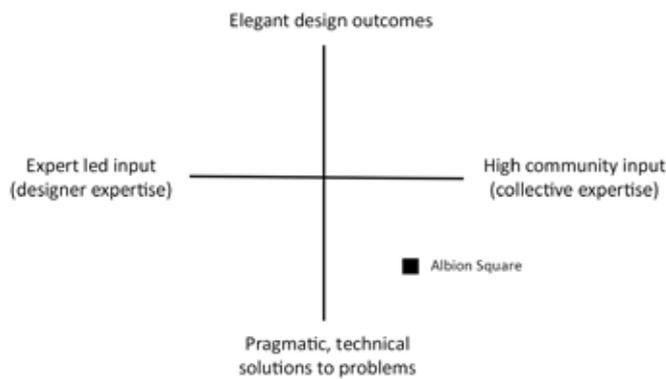


FIGURE 4. Theoretical model illustrating position of Albion Square relative to design expertise and participatory process.

things” with broader design considerations lost in the process. Preliminary observations therefore suggest that the nature of the organizational and professional contact between designers and communities is a vital factor in shaping design outcomes.

Further research involves selecting a contrasting case that could be located in the top right quadrant of the model. A comparative case serves to discover patterns or relationships that strengthen the findings of Albion Square or to illustrate how different types of engagement achieve both elegant and inclusive design outcomes.

References

- Cross, N. (2011). *Design Thinking: Understanding How Designers Think and Work*. London: Bloomsbury.
- Flyvbjerg, B. (2001). *Making Social Science matter: Why social inquiry fails and how it can succeed again*. United Kingdom: Cambridge University Press.
- Goldblatt, D. (2007). Lightness and Fluidity: Remarks Concerning the Aesthetics of Elegance. *Architectural Design*, 77(1), 10-17.
- Hare, R., & Nielson, J. (2003). Involving the grass roots [United Kingdom]. *Landscape design*(323), 37-41.
- Hirsch, A. B. (2014). From “Open Space” to “Public Space”: Activist Landscape Architects of the 1960s. *Landscape Journal*, 33(2), 173-194.
- Lawson, B., & Dorst, K. (2009). *Design Expertise*. MA: USA: Architectural Press.
- Plowright, P. D. (2014). *Revealing Architectural Design: Methods, Frameworks and Tools*. London & New York: Routledge.
- Roe, M., & Rowe, M. (2007). The Community and the Landscape Professional. In J. F. Benson & M. Roe (Eds.), *Landscape and Sustainability*. London: Routledge.
- Rowe, P. (1987). *Design Thinking*. Cambridge, Mass.: MIT Press.
- Schumacher, P. (2007). Arguing for elegance. *Architectural Design*, 77(1), 28-[37].
- Thompson, I. (2000). *Ecology, community and delight: Sources of values in landscape architecture*. London; New York: E & FN Spon.

Residential Outdoor Territory Revitalization Experience in the Cities of Latvia

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multi-storey residential territory | revitalization | courtyard design

In recent years, in some cities of Latvia the courtyards have been renovated and improved with new structures and playground equipment. After the investigation of the territory, discussions with the residents and after developing building projects, the courtyards are being revitalized every spring in one day. In these activities the specialists and students from Latvia University of Agriculture (LLU) Landscape architecture and planning programme, Riga Technical University (RTU) Architecture programme, Riga International School of Economics and Business administration (RISEBA) Architecture programme, Young Architects' Movement (YAM), the authors of the courtyards' Big Cleanup movement - society "Pēdas LV", Latvian Society of Landscape Architects (LSLA) and the residents of the cities are involved.

Thus, the article aims to provide the evaluation of these annual activities of revitalization processes in residential outdoor territories that have taken place in Latvian cities in recent years. The article analyses the interconnections, challenges and approaches of how to further engage and educate the residents of multi-storey communities to gradually revitalize their outdoor territories in accordance with modern planning principles, including the interviews obtained from the residents and the specialists involved in the process, and also the experience of both citizens and specialists involved in interviews as well as the teaching staff's and students' experience gained in the courtyard revitalization processes.

Introduction

The term quality of living-space is very common in Latvia. Before regaining independence in 1991, during the period of the USSR, the minds of Latvian architects were preoccupied by the aesthetics of a healthy environment and spatial environment organizational issues. The economic situation of the time and the ideological tendencies towards a better future allowed considering the quality and aesthetics of the environment (Karpova 2008). The importance of public space has been widely recognized, mainly from the perspective of improving the quality of life through a comfortable environment and abundant public life; enhancing the urban image through urban vitality; and urging economic development through investments which are attracted by a good image. Therefore, the changing nature of public space and the emergence of new public spaces can beautify the urban environment and make it pleasant to work, dwell, and relax in for people (Ramle et al. 2015; Li 2003). The Big Cleanup courtyard activities have been organized for many years on a regular basis. They are like a complex of educational activities with the purpose of involving the community in collective work, enhancing the participation and responsibility for a common urban cultural environment, since culture is not only art, music and theatre - our everyday culture is based on the environment we live in. Modern multi-storey residential area courtyards in most of the cities of Latvia have been neglected. The major part of the city is occupied by large residential areas built in the second half of the 20th century. Such multi-storey residential areas and their courtyards have not experienced any transformation or renovation over recent years. The present condition of the courtyards does not correspond to modern requirements. That results in multiple problems with territorial planning, and therefore the courtyards fail to provide functional exploitation possibilities for residents; thus, the planning can be characterized as unsuccessful. At present multi-storey

residential areas develop unevenly, and there is danger of stratification of several multi-storey residential areas. The main part of multi-storey residential areas does not correspond to the modern requirements of multi-functionality, and the residential fund has been used up (Īle 2011; Īle 2012). The degradation process of large-scale residential areas, very soon after the end of the building period can be attributed to many factors. Physical design and layout of the city, as well as the housing market and the process of negative image creating were mentioned among the main factors (Treija 2007). From the point of view of the modern urban planning theory, one of the large-scale residential environment development possibilities is functional differentiation of the courtyard space, whose resultant main task is a perception and exponentiation of its recreational potential. As Danish urban planner Jan Gehl emphasized, the three main directions in the functional and aesthetic spectrum of the public outdoor territory that can be pointed out are: necessary activities, possible activities and social activities. According to this division recreational function corresponds to the second category, where the processes of included functions are directly dependent on adequate outdoor territory conditions – “if there is a wish... and if one has time and place allows ...” (Treija, Bratuškins 2003).

In the city dimension, the public space is important in the aspect of the environment, culture and economy toward the improvement and balancing of the city (Ramlee et al. 2015). Consequently, during the last years, many Latvian cities have been carrying out renovation and rehabilitating activities in residential courtyards with the support from local businesses and government. For example, since 2013, in the city of Jelgava, the road construction company “Igate” has begun gradual renovation of courtyards, where, in collaboration with citizens and specialists, several courtyard areas are being improved, organized, landscaped and equipped with new elements. Parallel with the company’s “Igate Ltd” courtyard activities, till the year 2014 the joint Courtyard Renaissance project of the Foundation Riga 2014 and the Latvian Society of Landscape Architects (LSLA) was carried out - a project which was included in the European Capital of Culture programme. The project “Courtyard Renaissance” was created with the aim to encourage the residents of multi-storey residential areas to be involved in the improvement of their own living environment and in cooperation with specialists – landscape architects and gardeners - to search for solutions and possibilities of creating a modern, qualitative and aesthetic courtyard environment (Pagalmu Plānošana 2014). This article deals with the analysis and characteristics of the activity called the Big Cleanup courtyard movement, which has gained popularity in some cities and towns of Latvia. Aesthetic and functionally balanced outdoor space in multi-storey residential areas is the main criterion which determines the quality of the living space. The attraction of finances for reaching this quality is only one aspect of the solution to the problem. The second aspect of the problem is determined by public education and upbringing measures which should already start in the educational institutions. Unfortunately, this issue was regarded as not necessary, since vandalism was considered as “non-existing” in a post-socialism society.

Materials and Methods

The research on the revitalization processes of outdoor living territories and activities in the framework of the courtyards’ Big Cleanup activities, which has been organized in Latvia since 2011, was carried out in the period from November 2015 to January 2016. To achieve the aim, the courtyards’ photo fixations were used. They were obtained from the personal archives of the Landscape Architecture and Planning study programme students of Latvia University of Agriculture (LLU), as well as from their teachers’ personal archives and from the archives of the society “Pēdas LV”.

Scientific research literature – publications and electronic resources were also analysed.

In accordance with the aims of the research, the information summary and analysis on the revitalized inner courtyards over the period from 2011 to May, 2015 was carried out. To summarize the results of the research, the monographic or descriptive method was used which was based on the stated revitalization processes in the courtyards.

Results and Discussion

A positive aspect in the improvement of the condition of the apartment house courtyards is the energy-efficiency measures as a result of which a qualitative exterior architectonic image of buildings is obtained. The restoration of façades in the courtyards is attributed to the post-socialism period housing of the 50s-70s of the 20th century. The second issue is associated with the trees which were planted very close to the buildings. In the course of half a century they have developed abundant foliage, thus creating the apartment insolation problem as well as spreading of green foliage mass chlorophyll in the pores of the plaster of the houses. Consequently, the process of cutting down trees has started and it has to be carefully considered from the point of view of the courtyard draught. Shading and draught in the courtyard are the two key factors which need to be considered when planning the location of the new playground areas. Currently the local governments invest most of their financing in the improvement of access roads and parking zones. It is quite understandable, since from the time of inheriting a multi-apartment housing territory from the 90s of the 20th century, it was evident that the primary target in the 70s and 80s was to put the residential building into operation, leaving the landscaping of the territory for a later time (see Figure 1).

A second positive aspect to be mentioned is the location of the apartment houses’ residential areas close to kindergartens and schools. The financial investment of local governments in the improvement of the territories of educational organizations over the period of the last 5 years has played an important role in shaping the visual image of the common residential area. Ganību road and Satiksmes street area in Jelgava can be mentioned as positive examples (see Figure 2). By visually merging the outdoor territory with kindergarten and inner courtyards, a widely organized residential territory is formed. Of course, the territory lacks tree and shrub plantings, but their perspective locations have been planned, and they will be planted as soon as the finances are allotted.

With regard to the tree planting, not only the distancing to the external walls of buildings should be estimated but also the dendrological characteristics of the planting material and



FIGURE 1. The central part of the courtyard is occupied by parking lots. The territory of Satiksmes street, Jelgava. (Image: Aija Ziemeļniece, 2015)



FIGURE 2. Kindergarten territory next to the courtyard of residential area. Ganību street, Jelgava. (Image: Aija Ziemeļniece, 2015)



FIGURE 3. 48 Nicgales street in Riga, football goal made and erected by the residents.



FIGURE 4. Children activities and interest in landscaping process. (Image: www.talkas.lv)

tree tending measures. With the development of playgrounds and activity areas for educational organizations, the residents' interest increases and they want to develop such types of playgrounds also in the adjoining courtyards. This kind of positive competition and active participation is a good incentive for managers of the houses to increase the environmental quality in the residential zones.

One of the criteria to be taken into consideration when residential courtyards are maintained and improved is that at the municipal level each multi-storey residential courtyard needs to have a plan for raising funds to carry out certain types of work. At present that work is based on self-initiative, which, undoubtedly, is a good practice of doing volunteer work, but it is difficult to monitor.

Thus, in Latvia a wide campaign of courtyard clean-up, revitalization and improvement has been taking place for the last couple of years organized by the society "Pēdas LV" the framework of the Big Cleanup, particularly focuses on the courtyard territories of multi-storey residential areas created in the 20th century. The society "Pēdas LV" was established in Latvia in 2002. After several unsuccessful clean-up campaigns the manager of the society "Pēdas LV" Vita Jaunzeme concluded that the garbage is not created by extraterrestrials, and garbage per se is not the cause of the problem. People with their attitudes to the environment are in the centre of the problem (Pēdas LV). Consequently, since the year 2011, courtyards in

some Latvian cities and towns have been revitalized usually within the framework of the national-scale Latvia's Big Cleanup Day when everyone, who is interested in it and who is an activist in this movement, can propose some place in any region of Latvia to be freed from garbage and waste and then cleaned up.

The national-scale cleanup day is usually organized each year in April or May. On this day not only a territory is cleaned from different kinds of waste, but several courtyards are revitalized in different cities of Latvia. Table 1 presents the summarized information on the revitalized courtyards since the beginning of this activity. This table includes the names of responsible organisations or specialists among whom there are gardeners, landscape architects, students of the Landscape architecture programme from Latvia University of Agriculture, students of the Architecture programme from Riga Technical University (RTU), students of Riga International School of Economics and Business administration (RISEBA) Architecture programme, representatives of the Young Architects' Movement (YAM), the authors of the courtyards' Big Cleanup movement "Pēdas LV" society and Latvian Society of Landscape Architects (LSLA).

Courtyard revitalization process year, month, day	Latvia's city of the revitalized courtyard	Address of the revitalized courtyard	Responsible organization/ specialist in the courtyard revitalization process
2011/04/30	Aluksne	12 Apes street	YAM
2011/04/30	Riga	48 Nicgales street	YAM, LSLA
2011/04/30	Dobele	26 Berzes street	YAM
2011/04/30	Liepaja	84 Klaipedas street	YAM
2012/04/28	Riga	170 Maskavas street	YAM, LSLA
2012/04/28	Cibla municipality	Felicianova village home „Atspulgas”	LSLA
2013/05/15	Riga	9 Balvu street	LLU, YAM, LSLA
2013/05/15	Riga	63 S. Eizensteina street	LLU, RTU
2013/05/15	Riga	15 Valdeku street	YAM, LSLA
2014/04/26	Riga	6 Vilipa street	YAM, LSLA
2014/04/26	Riga	31 Berzupes street	LLU, RTU
2014/04/26	Riga	2 Lomonosova street	LLU, RTU
2014/04/26	Riga	1 Gredu street	LLU, RTU
2015/04	Riga	36A Darza street	LSLA
2015/04	Jelgava	8, 10, Liela street 5 Kr.Barona street	LLU
2015/04	Daugavpils	14, 16, 16 A Cesu street	LSLA

TABLE 1. The list of courtyards revitalized within the framework of Big Cleanup movement. (Source: table created by the authors, using public data of www.talkas.lv)

One of the first courtyards, which was partly revitalized within the framework of the Big Cleanup courtyard movement, was Aluksne courtyard at 12 Apes Street. All the analyzed courtyards were partly revitalized because the funds raised, involving the sponsors and supporters, were insufficient to cover the replacement of hardscapes and their improvement in the parking lots. As a result, for example. Due to the residents' and local community's initiative of the empty courtyard in the town of Aluksne, 12 Apes Street obtained completely new features in the year 2011 – basing on the YAM architects Liva Branka's Laura Meija's, Janis Leja's and Lasma Grogone's vision. In the courtyard of 12 Apes Street shrubs were planted, a basketball backstop with net was erected and the area in front of it was paved as well as new play elements for children were installed. In designing green spaces the local landscape architect and coordinator of the Big Cleanup Agris Veismanis (Lielā Talka) gave his professional advice to the residents of the multi-storey building residential area.

Another example is the courtyard of 48 Nicgales Street in Riga, where in 2011 new unusual football goal posts (see Figure 3), a litter bin, new bench surfaces from wood, and sand box frames were installed. The swings were also repaired there by installing new seats and chains (see Figure 4) and the slide was painted. The joint work at revitalizing the courtyard had also fascinated the naughty boys and girls, and a wheelbarrow became the most fascinating vehicle. The painting of wooden constructions was turned into a challenging competition, with children competing

for who would get the brush faster and who would paint the surface more beautifully. The soft mulch cover turned into a fight arena in which the children kept rolling, somersaulting and horse playing.

Even the chains of the new swing seats were used as a strength testing place – who would climb them faster and higher and invent the most unusual way of swinging. Time will show how in the courtyard of 48 Nicgales Street those residents, who had radically different views of the necessity of revitalization of the courtyard, will accept it (Lielā Talka).

The courtyard of 26 Berzes Street in Dobele attracted a large group of active young people and as a result of their enthusiasm a new playground was built, plantings arranged and benches made, basketball backstops with nets were erected and waste collection organized. In the courtyard of 84 Klaipeda Street in Liepaja, huge and physically hard work was accomplished - gravel paths made according to the design of young architects, a sand box made, ramparts created and ornamental shrubs, trees and berry bushes planted. On the adjoining asphalt paths “Giant's Footprints” were painted and lines drawn for children's games, which were tried by the young participants of the cleanup as soon as the lines were drawn.

A year later The Big Cleanup courtyard activity continued, and in 2012 two courtyard territories were revitalized (see Table 1). The revitalization process of the courtyard of 170 Maskavas Street in Riga was organized on a large scale – all the design constructions, which the architects intended, were



FIGURE 5. 170 Maskavas street in Riga - design constructions. (Image: www.talkas.lv)



FIGURE 6. 170 Maskavas street in Riga - design constructions. (Image: www.talkas.lv)



Figure 7. Revitalizing work process at the village house "Atspulgas". (Image: Inga Langenfelde, 2012).

built, new trees were planted, old bushes were dug out and replaced by new ones, old trees were cut down, tiled paths were repaired, new benches were made, the sand box was improved, a stage was built and different smaller works were done (see Figures 5 and 6). In Felicianova village, in the territory of the house named "Atspulgas" the residents together with the representatives from LSLA were divided into work groups so that by joint effort bird figures, swings and a carousel could be painted and new ornamental woody plants were planted. A new outdoor play canopy was built there as well (see Figures 7 and 8).

The Big Cleanup of courtyards in 2013, three courtyards in Riga: 9 Balvu Street, 63 S. Eizenšteins Street and 15 Valdeku Street. The atmosphere before and after the cleanup was very intensive and active. A wide exchange of opinions and discussions between the residents and project authors resulted in qualitative work. In 2013 the residents' activity was very great and the attitude to work was positive. Thus, the improvement of the environment by working together for the enjoyment and benefit of all the neighbours involved, was a success (see Figures 9 and 10).



Figure 8. Revitalizing work process at the village house "Atspulgas". (Image: Inga Langenfelde, 2012)



FIGURE 9. 63 S.Eizensteina street in Riga – revitalization and landscaping work. (Image: Niklāvs Josla, 2013)



FIGURE 10. 63 S.Eizensteina street in Riga - revitalization and landscaping work labiekārtošanas darbi. (Image: Niklāvs Josla, 2013)



FIGURE 11. 1 Gredu street in Riga – courtyard transformations. (Image: Una Īle, 2012)



FIGURE 12. 1 Gredu street in Riga – courtyard transformations. (Image: Una Īle, 2012)

In 2014, four large courtyards were revitalized in Riga: 6 Vilipa Street, 31 Berzupes Street, 2 Lomonosova Street and 1 Gredu Street. It was the year when the courtyard revitalization reached its peak within the framework of the Big Cleanup campaign due to the fact that in 2014 Riga became the European Capital of Culture with a great number of tourists and a variety of cultural events and activities organized in the city. As a result of that the courtyard cleanup and revitalization activities were widely

supported by the residents and the results were very successful. In each courtyard some preparatory work was carried out, each courtyard obtained a new playground area, for instance, the courtyard at 6 Vilipa Street had a new fence section and entrance gate installed which were built by the residents (Lielā Talka), whereas the courtyard at 1 Gredu street obtained a completely new children's playground (see Figures 11 and 12).



FIGURE 13. 8 and 10 Liela street and 5 Kr.Barona street in Jelgava – courtyard transformations. (Image: Una Īle, 2012)



FIGURE 14. 8 and 10 Liela street and 5 Kr.Barona street in Jelgava – courtyard transformations. (Image: Una Īle, 2012)

In the spring of 2015, with the support of sponsors, the society "Pēdas LV" continued its annual cooperation with the specialists from Latvia University of Agriculture and students acquiring the programme of Landscape architecture and planning as well as the Architecture programme students from Riga Technical University (RTU) organizing a new type of cooperation with the local governments of the involved cities in which the courtyards were planned to be revitalized, thus involving new specialists in the Big Cleanup Courtyard activities. The aims of the building projects were reached by carrying out the project in nature. A fruitful cooperation took place with the most active residents from the courtyard who informed and involved their neighbours in the work. The local governments were also informed about the aims of the Big Cleanup Courtyard movement and additional support possibilities were considered in terms of tools, soil, transport, etc. to carry out the work (Lielā Talka). The great revitalization work at 8 and 10 Lielā Street and 5 Kr. Barona Street in Jelgava is shown in figures 13 and 14. In the further development of courtyards it is necessary to involve inhabitants, who, together with experts, will come to optimal solutions for the territory (Īle 2012).

Conclusion

Finally, an indispensable factor in revitalization and improvement of residential outdoor territories is listening to the residents' desires and opinions. It is necessary to reduce the impact of the degradation processes in the residential outdoor territories by informing the residents about the rational use of the inner courtyard landscape space. Most residents want to revitalize their courtyard territories. Consequently, in the large-scale housing estates of the Soviet period Latvia the revitalization processes of the residential outdoor territories should be persistently continued, taking into consideration the housing condition and character, utilities, wear and tear, infrastructure planning, present condition of the plantings, insolation of the territory, draughts and other significant aspects to be assessed by professionals.

Overall, during the period of the Big Cleanup courtyard movement from the year 2011, 16 courtyards in the cities of Latvia have been revitalized and an irreplaceable experience has been gained at the universities' level, by giving the students involved in these activities an in-depth practical experience

and understanding of the processes of housing project design and implementation as well as giving positive emotions and impressions to the residents of the courtyards. The Big Cleanup Courtyard movement activity is evidence of the necessity of such revitalization processes in the courtyards of multi-storey buildings, where gradually the degraded territories in the courtyards are revitalized by active involvement of all the interested persons in the processes, thus creating new possibilities for different age groups to be involved.

References

- Īle, U. 2012. Compositional planning of residential outdoor space in courtyards. Scientific Journal of Riga Technical University, Architecture and Urban Planning, Vol. 6, p. 6-11.
- Īle, U., 2011. Development tendencies of landscape composition in urban residential areas of Latvia. Civil Engineering '11, Vol. 3, 193-201.
- Karpova, Z. 2008. The quality of living space in Latvia. The present state. Scientific Journal of Riga Technical University, Architecture and Urban Planning, Vol. 10, 180-192.
- Li, M. (2003). Urban regeneration through public space: A case study on squares in Dalian, China. University of Waterloo, 139.
- Lielā Talka [online 02.04.2016] www.talkas.lv
- Pagalmu plānošana 2014 [online 15.10.2015.] www.pagalmuresanse.lv
- Pēdas LV [online 03.03.2016] www.pedas.lv
- Ramlee, M., Omar, D., Yunus, R., M., Samadi, Z. 2015. Revitalization of Urban Public Spaces: An Overview. Procedia – Social and Behavioral Sciences, Elsevier, Vol. 201, 360-367.
- Ramlee, M., Omar, D., Yunus, R., M., Samadi, Z., 2015. Revitalization of Urban Public Spaces: An Overview. Procedia – Social and Behavioral Sciences, Elsevier, Vol. 201, 360-367.
- Trejja, S., 2007. Problems of Development of Large Scale Housing Areas in European Cities. Scientific Journal of Riga Technical University, Architecture and Urban Planning, Vol. 10, 124-131.
- Trejja, S., Bratuškins, U., 2003. Development Problems of Large Scale Housing Estates in Riga. Scientific Journal of Riga Technical University, Architecture and Urban Planning, Vol. 2, 77-83.

Bridging Gaps Between Landscape and Architecture in Norwegian Post-War Modernism

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Grindaker | Viksjø | Oslo | Hydro Park

During the first half of the 20th Century, landscape architects in Norway struggled to gain recognition and were often ignored by architects. Today, the situation has changed, landscape architects are widely acknowledged and there are many examples of the bridging of the two professions. This paper asks how and when the shift in attitude and practice occurred. The study has identified and analysed key projects where landscape architects and architects have developed a common platform of mutual respect. The sources of the study are interviews. The analysis is based on historical theories of modernism in landscape architecture, especially Hauxner (2002). One key project is the so-called "Hydro Park" in Oslo from 1960. In front of a 14-storey administration building, designed by architect Erling Viksjø, the park was established and made open to the public. The park consists of long slim concrete walls that partly incorporates height differences and partly acts as anchor for the benches. A rectangular pool and two sculptural walls with a mosaic of sawn stone are framed by large trees and lawn areas. The design of the park is clearly inspired by the architecture of the building, as well as by abstract art. The project was a milestone in terms of collaboration between architects and landscape architects. The paper concludes with a set of criteria that have been crucial for the successful collaboration between the two neighbouring professions. Most important is the recognition of competence and conceptual development in the design phase.

In an article in *Landscape Architecture* in May 1983, American landscape architect Garrett Eckbo asked the rhetorical question: "Is Landscape Architecture?" The question of course had no definite answer, but brought forth a set of reflections about the relationships between the two professions. Today, more than three decades later, the question is no less relevant. There are signs that the links between architecture – urbanism and landscape architecture which gets stronger and the divisions between them more blurred. Recently, Gareth Doherty and Charles Waldheim published the book: *Is Landscape ...?* Here they take Eckbo's question from 1983 as a starting point for a discussion of landscape as a representational medium, academic discipline, and professional identity. In the book, landscape is defined through a multitude of perspectives from literature to history, pointing to a new positioning of the field's relation to neighbouring disciplines multi-disciplinary firms like Norwegian Snøhetta win ever more foothold on the international arena. Snøhetta brands itself a multidisciplinary company and emphasize their "transpositioning" as their prime working method. (<http://snohetta.com/process/transpositioning>) An organisational convergence is taking place in some countries, most notably Sweden: The Swedish Association of Architects was founded in 2002 through a merging of the former associations for building architects, interior designers, planners and landscape architects. In Norway there has been a process aiming at a similar merging during the past three years. There is still no agreement despite a majority in all groups for a closer organisational relationship.

The general picture is still to some extent characterized by an inferiority complex, e.g. as expressed by Thomas Oles and Brian Davis: "landscape architects are still cast as pliant helpmeets in the service of architects and their clients". (Davis and Oles 2014) In 2010, the rector of Oslo School of Architecture, Karl-Otto Ellefsen claimed that the further development of conceptual



FIGURE 1. The Hydro Park in Oslo shortly after completion in 1960.
(Photo by B. Stensrød)

creativity among landscape architects was a main prerequisite for a closer collaboration among the disciplines. (Jørgensen and Stabel 2010, 26) Nevertheless, the situation is different from what was the case when Eckbo posed his question in 1983. Landscape architecture today is generally acknowledged as a legitimate and important profession in most countries, not least as seen on the background of the environmental crisis. The time when landscape architects primarily filled a decorator's role after the architects and planners had set the stage, is definitely over. In his article, Eckbo states that "To be true, landscape architecture must do what its name implies – it must integrate landscape and architecture. True landscape architecture produces systems or relations in which neither "landscape" nor "architecture" becomes mere decoration for the other."

How and why did this shift happen? In Norway, the new way of thinking about this happened around 1960. One specific landscape project can illustrate this; the Hydro Park in Oslo.

Until the mid-sixties the name of the profession in Norway was garden architecture, and most professional activity was centred around gardens, or (from late 1950's) around landscape reclamation in connection with hydropower development. The number of members of the Norwegian Garden Architects

Society NHL in 1960 was just around 50, and in general, significant landscape design assignments would be carried out by architects. With a few exceptions, this was the case in most European countries in the 1950's. (Hauxner 2002)

Such was the situation when Morten Grindaker (b. 1926) entered the study programme of garden architecture at the Agricultural University in 1950. He was a close friend of Odd Østbye (1925-2009), who studied architecture in Oslo from 1947 to 50. Grindaker excelled as a student by participating in several competitions for the design of parks. In 1951, Grindaker and Østbye got a first prize in the competition for the design of a park in Moss. As a graduate garden architect in 1953, he was one of the very few who tried to make a full time living as a private practicing landscape architect. In the beginning, he designed primarily residential gardens for the bourgeoisie in Oslo. Through his friendship with Østbye, leading modernist architects like Arneberg, Platou, Fehn, Grung, and Viksjø contacted him to design the villa gardens they otherwise would have drafted themselves.

Egil Gabrielsen joined the firm in 1959. Gradually they were involved in bigger and more urban projects. In 1957-58, Erling Viksjø won the first prize in a prestigious competition for the new headquarters for Norsk Hydro in central Oslo.

Grindaker and Gabrielsen got the commission due to their binding relationship with Viksjø and other leading architects, (Jørgensen and Stabel 2010, 16) and because a prerequisite for the competition set by the municipality of Oslo was that there should be a public park on the site. Norsk Hydro did not want to have direct access to the entrance area of the building from the park. The park is therefore isolated from the building, but the design is encouraged by the architecture with rectangular shapes, and long walls that extend into the green park. A recessed space surrounded by walls with long benches and free-standing concrete walls with artistic decoration form a sheltered area with a rectangular pool and fountain. The composition resembles contemporary art, with rectangular, overlapping surfaces and continuous lines, like in a picture by Mondrian. The modular logic relates the park to the facade of the building, but the composition with the walls extending from the base of the building and framing the green park space with the pool, creates a centre of gravity independent from the building. This is also in line with the functional discontinuity: the park's raison d'être is to be viewed from above, from the windows of the office block.

Gabrielsen and Grindaker's cooperation with Viksjø marks a crucial phase in Norwegian landscape architecture. In the Danish journal *Havekunst*, garden architect Olav R. Skage reviews the Hydro Park, assuring that "it is an improvement for Norwegian garden designers that they are creating things that are worth a discussion." The reasons for the successful cooperation and the following development seems to have been the personal relation between landscape architect Grindaker and architect Østbye, reducing mutual scepticism and opening up for a learning and exchange process between the two disciplines and traditions. In addition, the parks department in Oslo had landscape architects employed who defined the programme for the landscape aspects of the project. Another reason may have been the relative equality between the professions in Norway. The first study programme in architecture at university level came as late as 1910 at NTH in Trondheim (later NTNU), only nine years before the first programme in garden architecture appeared in Ås at NLH (later NMBU) in 1919. The power relationship was therefore not as biased towards architecture as in many other countries where architecture had a strong position when landscape architecture was established.

References

- Davis, Brian and Thomas Oles: "From Architecture to Landscape. The Case for a New Landscape Science" in *Places*, October 2014. <https://placesjournal.org/article/from-architecture-to-landscape/>
- Doherty, Gareth and Charles Waldheim: *Is Landscape...? Essays on the identity of the landscape*. Routledge, London 2016
- Eckbo, G: «Is landscape architecture?» *Landscape Architecture*, vol 73, no. 3 (May 1983) 64-65
- Hauxner, Malene: *Open to the sky: the second phase of the modern breakthrough 1950-1970 ; building and landscape, spaces and works, city landscape*, Arkitekten Forlag, Copenhagen 2002
- Jørgensen, Karsten and Vilde Stabel: *Contemporary landscape architecture in Norway* Gyldendal Akademisk, Oslo 2010
- Skage, O.R. 1963. «Hydroparken» *Oslo. Havekunst* 44. (1), p. 92 – 95.

Bridges are Landscape Infrastructure Elements – A Method for Connecting a Bridge with Landscape and Infrastructure

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bridge | landscape infrastructure | connection | symbol | natural processes

Bridges are landscape infrastructure elements. Looking through the eyes of a landscape architect, bridges become a continuation of the landscape; a manmade action that heals the misconnections of the landscape. The problem of infrastructure as a type of landscape and connecting element is a crucial topic which influences the landscape. Connecting infrastructures such as bridges provoke urban, economic and cultural development. The theoretical and methodological analysis of the infrastructure as landscape element is important, in order to shape conditions for design. By analysing examples such as the Golden Gate Bridge and Oresund Bridge, through landscape lenses, the notion of connection and its role in the formation of the landscape will be exposed. The challenge for landscape architects is to conceptualize and illustrate a design approach that involves the landscape-urban connection and influence the society, economic growth and natural processes. The design of a bridge is a multidisciplinary design which requires deep understanding of the landscape, natural processes and engineering. The framing of the landscape through the infrastructure, sense of orientation, symbolism, imageability and adaptability of the design constitute the method which a landscape architect should follow in order to design a landscape infrastructure.

Nature is appropriated in humanities not as a reality but as a human idea of the reality (Martin Drenthen 2009) and that is because all landscapes are the product of human cultures, even those thought of as natural or wild (Raymond 1980). Culture and nature overlap spatially and impact each other functionally (Sijmons, March 2013). Most of the processes around us are a hybrid of nature and human power. What has become clear through the years is that culture and nature are inextricably linked. Bridges belong to the cultural landscape which is defined as a “geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity or person or exhibiting other cultural or aesthetic values.” (Charles A. Birnbaum 1994) Bridges are made by people for people, they are closely related to them and to the imageability of the landscape where they are implemented.

Bridges can change the mental image of a city. A legible city is one whose parts, landmarks and pathways are easily identifiable and grouped in an overall pattern by people. The imageability of a city reflects in the mental image of its observers. The shape, colour and arrangement are elements that can describe the image of a city (Lynch 1960). Bridges are related to the notions of movement and cessation. They facilitate the orientation and legibility of space. By implementing a bridge, not only a potential landmark is created but also a point of orientation, an intense movement and place of observation. When a bridge is merged smoothly with the existing landscape, it can be part of the image and understanding of the city and through this, can be embraced by the beholders. Bridges are meeting points, places where everyone can refer to. The Golden Gate Bridge is a good example of a symbolic landscape bridge implemented in a strong seascape (Figure 1).



Golden Gate Bridge, San Francisco, California, 1933-1937:

In 1930 there were discussions on building a bridge that could connect the city to the Marin Headlands. It was a hard assignment due to a lot of restrictions such as changing tides, earthquakes, strong currents and harsh weather conditions. It was a cooperative design involving a lot of architects and engineers such as Joseph Strauss, Irving Morrow and Charles Alton Ellis. The architects and engineers designed a balanced form that becomes both natural and aesthetic. The famous orange colour derived from the Art Deco ideas of Irving Morrow, but it was also a way to connect the structure of the bridge with the soil type colour of the landscape around. The exaggerated height of the columns competes with the hilly landscape around but on the moment of sunset, the golden reflection of the structure, the warm colours of the rocks and the orange sun create a unique view towards the end of a day. The bridge functions as a gate to a new world by celebrating the cities it connects. It is linked with the landscape and the narrative of the area.

FIGURE 1. The Golden Gate Bridge is a symbolic landscape bridge with both geometric and timeless forms.



FIGURE 2. A bridge reacts as a symbol when it enhances stimuli of its observers. The function of the Erasmus Bridge is to formalize the crossing between the Northern and Southern areas of Rotterdam.



FIGURE 3. The bridge structure is harmoniously integrated with the landscape. It inspires rhythm and it creates a new horizon. A new perception of the seascape.

Bridge Connections

Connectivity is important for the dispersal of organisms that inhabit the landscape. It can be operated either through natural connecting elements such as fallen trees and rocks or through manmade infrastructures such as bridges and paths. In order to avoid altering the ecology and biodiversity of the landscape elements due to the new introduced forms, the merging of landscape and infrastructure should be operated carefully.

Bridges have always been symbols of connection and communication. For example the Erasmus Bridge in Rotterdam, Netherlands, was built firstly to connect the part of the city and secondly to remind the city of its industrial character (Figure 2). The Golden Gate Bridge was also built to connect two different landscapes and to celebrate the entrance in each one. Ecological bridges are manmade structures as well, but they can be adapted completely by nature. Humans create the conditions for nature to come and settle. Bridges are symbols of strength. They represent barriers, paths, crossings and they are implemented in everyday activities. They are symbols of hope, destination,

progress and connectivity.

Important Elements of a Bridge

The framing of the landscape through a bridge is also an important aspect of its design. Bridge structures can be harmonious and integrated within the landscape when they are in the adapted scale, alignment, colour and material. The design should inspire rhythm and harmony. For example, a smooth deck that is aligned with the horizon gives a harmonious view to the driver that drives through the bridge. Another example is the perception under the bridge, where the pillars meet the water and give a rhythm by creating a pattern to the horizon. The framing of the horizon that the Oresund Bridge creates is an important characteristic of the area (Figure 3). The strong shape of the bridge and the taller pillars in the middle, accompany the driver through different landscapes and mark the biggest span of the river for the boats while creating a climax at the crest. By framing the landscape through the bridge structure, the bridge reacts as a measuring system for the landscape which each beholder can use.

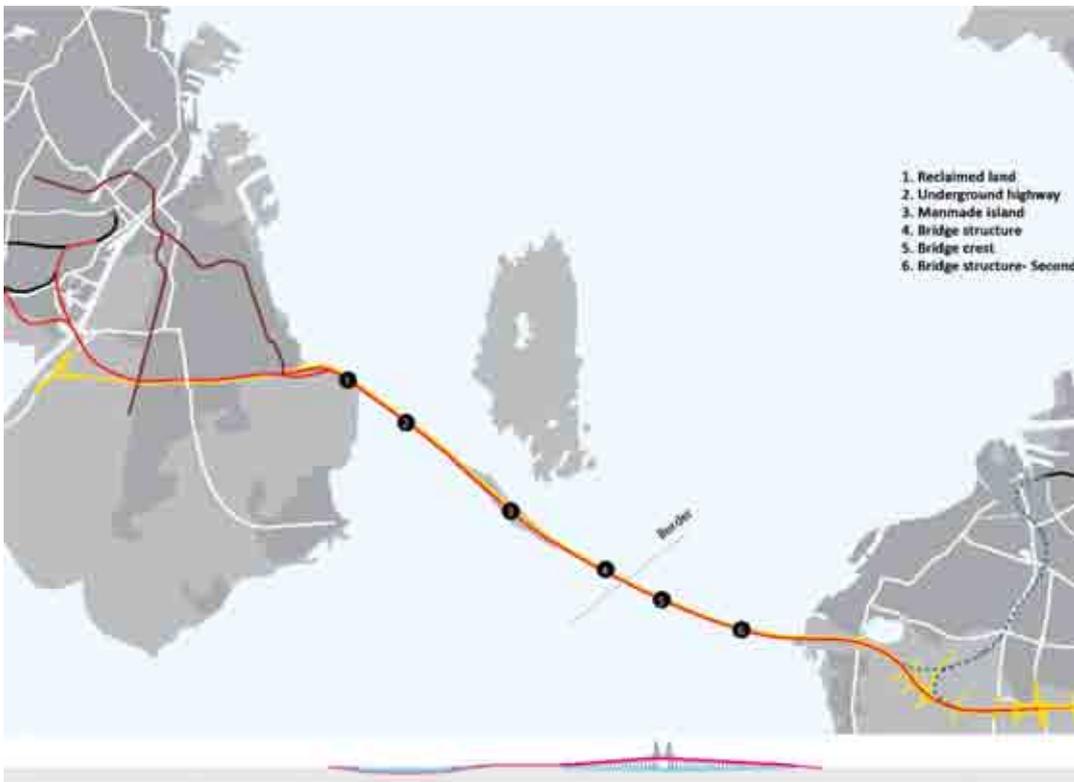


FIGURE 4. The complete landscape design of the Oresund Bridge. The design has six parts: Two landings on each side, the manmade island in the middle, the bridge and its crest and the tunnel structure.

Oresund Bridge, Scandinavia, 1994-2000:

Oresund Bridge is a fixed road and rail connection between Central/Western Europe and Scandinavia. After its construction, it provoked touristic movement, economic investments and population growth. What is remarkable about the bridge is that it is divided into 3 moments. The first one is the bridge itself that starts from the agricultural fields of Swedish ground, it moves up on the crest of the bridge where the taller pillars are, it lands on a manmade island and then it follows a tunnel under the sea that exits on the reclaimed Danish land. The whole landscape design is described through the movement of the infrastructure. It is a good example of a landscape bridge that takes into account in the design the framing of the landscape, the nature preservation and the large economic and infrastructure connection.



FIGURE 5. The Pepper Island is a form of new nature that was a side creation of the Oresund Bridge. It is manmade but completely integrated in the natural environment of the area.

In addition, altering the surrounding landscape of the bridge is an important design assignment. In the example of Oresund Bridge, the landscape architects reclaimed a piece of land in order to make the exit of the tunnel on the western side and avoid undesired interferences in other locations (Figure 4). This new piece of land created conditions for the nature to adapt and take over. Another important alternation in the landscape was the creation of a new island in order to make the junction between the tunnel and the bridge. Instead of using the existing island, a new one was created nearby with the excavated material of the construction; this allowed to

preserve the first's biodiversity. As it was proved recently, this new island merged with the larger seascape; small mammals and birds can be found on the island making the place part of nature. A manmade structure can be adapted completely from nature as long as there are the right conditions for it. Bridges are manmade structures that have the possibility to become under proper circumstances, a new type of nature (Figure 5).

Moreover, a bridge design refers to all possible scales. It is ostensibly a small connection but its influence extends to the wider urban tissue and social, economic and landscape layer. For example, the Oresund Bridge was designed not only to connect Copenhagen and Malmo, but also to achieve an international connection between Central and Western Europe to Scandinavia. The connection is physical as it is political and economic. It is a motor for touristic and economic growth. The bridge became a motive for further investigation in a new urban plan of the city to handle the population growth and further ecological improvement of the Oresund bay.

The Role of a Landscape Architect

In conclusion, bridge design should not only engage with its structure but also the design of the landscape around. All the elements (structure, landscape, function and people) should function as a whole in order to recite a story for the places they connect. The approach of infrastructure as landscape can be considered as object oriented; the infrastructure is treated as an object in an integrated design which emphasizes the shape and form. On the other hand, conceiving landscape as infrastructure can be a goal oriented approach, which focuses on the urban development and ecological/economic processes (Steffen Nijhuis 2015). When a design obtains both qualities at the same time, it becomes an integrated design which deals simultaneously with spatial, ecological and socio-cultural qualities. A good bridge design can transform and enhance the landscape itself, it celebrates the landscape and influences of all possible scales. Designing and building a bridge is a multidisciplinary design which should involve many areas of expertise. In order for the design to be landscape oriented, it should offer strong connection appropriated in all scales, it should frame the landscape through the infrastructure, treat each landing of the bridge and provide a rhythm in the landscape, taking into account ecological alternations and finally involve beholders' perception. Designing a landscape bridge requires a better understanding of the infrastructure and its impact on the landscape. Natural processes are a strong element of the landscape design and should be introduced.

References

- Charles A. Birnbaum, A. (1994, September). Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes. Retrieved from www.nps.gov: <http://www.nps.gov/tps/how-to-preserve/briefs/36-cultural-landscapes.htm>
- Donald MacDonald, I. N. (2008). Golden Gate Bridge: History and Design of an Icon. San Francisco, California: Chronicle Books LLC.
- Lynch, K. (1960). The image of the city. Massachusetts: Joint Center for Urban Studies.
- Martin Drenthen, J. K. (2009). New visions of Nature: Complexity and Authenticity. USA: Springer.
- Parks, G. G. (2014). What's out there. The Cultural Landscape Foundation.
- Raymond, W. (1980). Ideas of Nature, in Problems of Materialism and Culture. In W. Raymond, Ideas of Nature, in Problems of Materialism and Culture (pp. pp67-85). Verso, London.
- Sijmons, D. (March 2013). Waking up in the Anthropocene. Rotterdam: IABR.
- Steffen Nijhuis, D. J. (2015). Flowscales. Designing infrastructure as landscape. Delft: TUDelft.

Design as a Learning Process Utilizing Knowledge and Building up Knowledge

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design | design process | learning

A number of design researchers with different backgrounds have defined design in various ways. The points more or less common to these definitions include initiation of change, improvement, satisfaction of needs, solution of problems, and invention of new things. Moreover, some design theorists describe design as a goal-oriented, decision-making, learning, and knowledge application activity. Hence, by deriving from the definitions of design which were set forth by many design theorists, in this conceptual paper, we argue that the cyclical and reiterative model of the design process which relies on the consideration that the phases of the design process essentially require feedbacks occurring through multiple cycles enables learning. While the designer uses precedent knowledge in order to propose solutions to particular problems which were set at the beginning of the design process, they build up new knowledge as the design progresses.

Introduction

The term design is used both as a noun and as a verb, referring to an end product and a process, respectively. Thus, design has been defined in numerous ways by a number of design researchers with different backgrounds. The points more or less common to these definitions included initiation of change, improvement, satisfaction of needs, solution of problems, and invention of new things. Thus, a definition of landscape design can be considered as an intentional activity initiating change in the existing environmental conditions which comprise of natural and/or man-made things in order to solve problems, meet the needs of individuals, and create desirable and/or improved conditions in an imaginative manner.

To accomplish these goals, a landscape designer follows a routine which involves a sequence of activities that are interactively related to each other. As Lawson (2005) states, these activities which are named as analysis, synthesis, and evaluation involve, respectively, the setting of objectives as well as structuring of the problem, generation of solutions, and critical evaluation of suggested solutions against the objectives identified in the analysis phase. Although this process by its first generators was assumed as a linearly succeeding one, the subsequent design models led to the understanding that design was an iterative process (Motloch 1991) involving feedback loops among the phases of the design process which occur through multiple cycles (Gilbert 1987 as cited in Murphy 2005: 52).

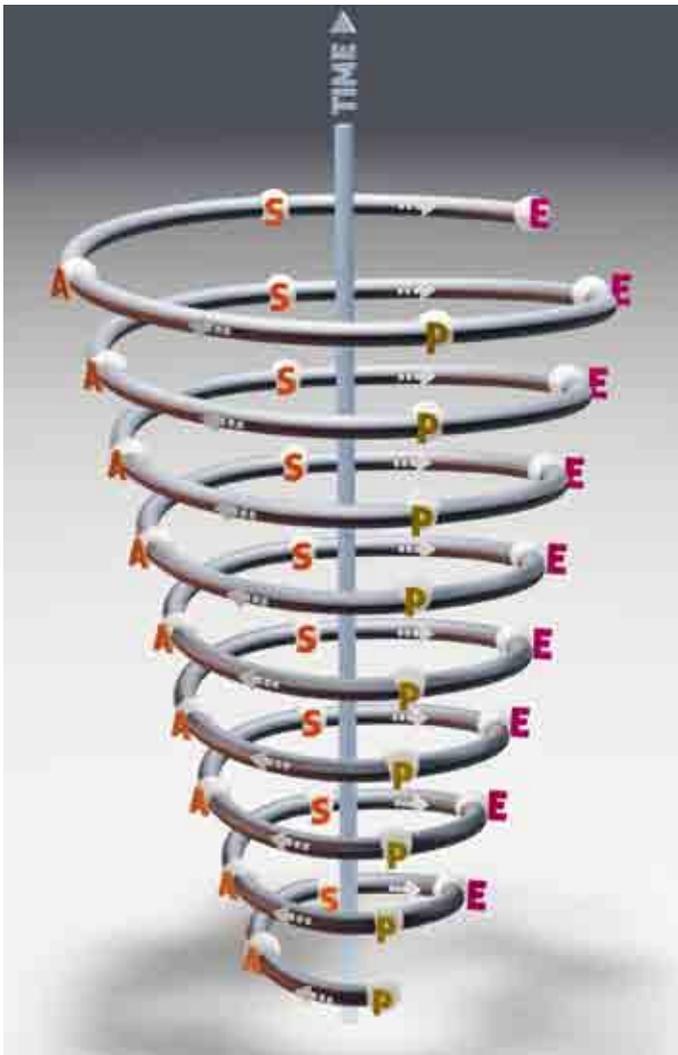


FIGURE 1. The cyclical and reiterative model of design evolving along a spiral path. (P: Problem, A: Analysis, S: Synthesis, E: Evaluation)

The Design Process

The design process starts with a problem waiting to be resolved by the designer. Yet, in most cases, design problems lack clarity. Thus, owing to the difficulty of identifying a problem at the analysis phase of the design process, some design researchers suggest that a solution which is proposed to illustrate an ill-defined problem could lead to a better understanding of it.

Indeed, both the problem definition and the design solution relative to it are continually open to reinterpretation (Murphy 2005). As the designer offers solutions to achieve the goals and satisfy the constraints which were set initially in the analysis phase, the appraisal of these solutions makes them realize the emergence of new and different problems and/or constraints which need further solutions and/or satisfactions. Thus, it is this continuous emergence of new problems, proposal of new solutions, and appraisal of these solutions that makes the design process an iterative and a cyclical model evolving along a spiral path (Figure 1).

As Murphy (2005) claims, the repetition of the phases which constitute the design process in a reiterative or cyclical manner improves the quality of design results. Similarly, Hoadley and Cox (2009: 20) put that “good design is iterative” and “iterations only help if some feedback (data) is used to improve the design for the next iteration”. Indeed, feedback provides the designer the opportunity to learn, and any opportunity of learning provides the designer the opportunity to build comprehensive understanding of the design problems at hand (Murphy 2005). Hence, while the designer uses prior knowledge in order to propose solutions to particular problems which were set at the very beginning of the design process, they build up new knowledge as the design progresses. Thus, the design process becomes a learning process which, as argued by Sim and Duffy (2004), leads to provisional, *in situ*, and retrospective learning.

Learning Through the Design Process

Provisional learning in design takes place prior to the design activity (Sim and Duffy 2004). Indeed, a designer, immediately after being assigned a design task, starts to gather specific design knowledge that they need for accomplishing the task they were allotted (van Aken 2005). This domain knowledge to which designers can refer in order to find relevant solutions or ways of designing is often embodied by precedents (Kim and Kim 2015). Besides, in order to determine the opportunities and constraints that are inherent in a site, a landscape designer identifies the general characteristics of that particular site in terms of physical and cultural conditions. Hence, while conducting site and cultural inventory and analysis, the designer makes connections with regards to their prior knowledge about the ecological and social sciences, construction techniques, as well as arts. Thus, acquisition of explicit and implicit knowledge which is interpreted differently depending upon the needs of designers (Duffy 1997) brings about input information or knowledge into the design activity (Sim and Duffy 2004).

In *in situ* learning, learning occurs together with the design activity (Sim and Duffy 2004). After identifying the design problem and setting up a design goal/goals, the designer offers creative solutions to achieve this/these goal/goals and satisfy the constraints by using domain knowledge and the input information they gained in the analysis phase. Thus, a landscape designer experiences to make an integration of ecological, technical, socio-cultural and psychological concerns with those of aesthetics. However, while trying to develop alternatives by employing various design approaches, they may come across new problems and/or constraints. Hence, the need for developing new solution proposals to these additional problems and/or constraints which appear while the design is in progress may trigger the designer to search for further knowledge. The designer, being in search for additional knowledge on account of the solutions they have proposed, in turn offers new solution proposals by putting new insight into the design in light of the new knowledge gained. Thus, through these concurrent movements between solution proposition and knowledge acquisition, a landscape designer not only acquires new knowledge but also learns to integrate reasoning with intuitive thinking.

Retrospective learning is a post design learning which occurs after the completion of certain design activities (Sim and Duffy 2004). Thus, evaluating the final design solution before and/or after implementation (e.g. in the form of juries as well as public discussions, and post-occupancy evaluations, respectively) leads to retrospective learning as the designer, owing to the assessments of peers and/or users, learns about the fallacies and accuracies in their reasoning and/or intuitive thinking. Hence, this experiential knowledge, as mentioned by Sim and Duffy (2004), becomes an input knowledge for subsequent design tasks.

Conclusions

The cyclical and reiterative model of the design process enables a designer to make use of the knowledge acquired formerly and gain new knowledge throughout the process. Hence, the landscape design process ensures tacit integration of theoretical and practical knowledge with a broad and deep understanding of natural and social systems through creativity. Accordingly, landscape design teaching focusing on the design process, rather than concentrating on the product, by means of the guidance and collaboration of the faculty and practicing landscape designers would promise not only reflective linking of the theoretical issues with the practical ones, but also assure reflective actions between the expert designers/tutors and the novice designers/students. Likewise, since landscape design involves a wide range of concepts from various disciplines, an interdisciplinary approach to tutoring landscape design would help students identify multiple viewpoints that contribute to an understanding of a given topic. Besides, involvement of stakeholders in the design process and working with real design problems would also challenge students to practice landscape designing. Thus, landscape design teaching through the employment of design process enriched by site visits, lecture series, assignments, discussions, pin-ups, desk-crits, as well as juries would allow students to learn both about landscape design and about the matter of designing.

References

- Duffy, A.H.B., 1997. The 'what' and 'how' of learning in design, invited paper. IEEE Expert -Intelligent Systems, 12 (3), 71–76.
- Hoadley, C. and Cox, C., 2009. What is design knowledge and how do we teach it? In: C.diGiano, S.Goldman and M.Chorošt, eds. Educating learning technology designers: guiding and inspiring creators of innovative educational tools. New York: Routledge, 2009, 19–35.
- Kim, E.J. and Kim, K.M., 2015. Cognitive styles in design problem solving: insights from network-based cognitive maps. Design Studies, 40 (2015), 1–38.
- Lawson, B., 2005. How designers think? The design process demystified. 4th ed. Amsterdam: Elsevier.
- Motloch, J.L., 1991. Introduction to landscape design. New York: Van Nostrand Reinhold.
- Murphy, M.D., 2005. Landscape architecture theory. Long Grove, Ill.: Waveland Press, Inc.
- Sim, S.K. and Duffy, A.H.B., 2004. Evolving a model of learning in design. Research in Engineering Design, 15 (2004), 40–61.
- Van Aken, J.E., 2005. Valid knowledge for the professional design of large and complex design processes. Design Studies, 26 (2005), 379–404.

From Alley to Garden: Co-Creating Spaces Through a Build-Design Process

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site transformation | co-creation | handcrafted space |
build-design | urban design

The transient visual aesthetics of the DIY has become apparent in the contemporary city. Public spaces that are created from simple "at-hand" materials have a different expression from the more permanent city. But these instant hand-made spaces are made in stark contrast to how public sites are usually planned, designed and build. They allow for a whole different way of engaging users in not only the design but also the construction phase of a project. Thus the phenomenon of co-creating environments by hand from available resources has emerged in urban design as a potential way to involve citizens in the creation of space in 1:1 (Oswalt 2013).

At the University of Copenhagen we have explored methods of facilitating a process of constructing outdoor spaces with children through an on-site building process. The aim of this practice based experimental research project was to test methods of engagement and to examine if the involvement had any impact on the following practices and use of the space. We also wanted to examine how these methods could be understood, compared to more traditional planning, design and production processes and typical representational post-it user involvement.

The project involved children and staff from the youth club Klokkegården situated in a multicultural district of Copenhagen. The area is quite challenged with vandalism and social problems. For many of these kids the youth club constituted a second home supported by a highly committed staff. Therefore a more immediate aim was to help the club transform a site adjacent to their club house from abandoned unpleasant alley into a lush lounge garden atmosphere.

Engaging the kids in a representational design process revealed very open and simple site ambitions. Planting beds, a place to be outside on ones own terms and a fire place were the most immediate needs. They had a dream of having their own green space where kids (and locals) could hang out and learn about growing vegetables. The research team sketched out a rough design and a process where as many of the building activities could include kids and staff. We designed a series of modular elements that could be moved around along with some more unique and site specific features: Seven planting beds in two different heights tinted black to add depth, five wooden benches, a terrace floor to break the monotony of the asphalt surface and a fireplace encircled by some big logs for seating. The aim was to create a flexible but still robust space scaled down into several niches and hang out spots. With the involving building process we hoped would enhance the children's connection to the space and thereby bridge the gap between use and care of the garden.



FIGURE 1. Collecting wood in the forest for the building process.



FIGURE 2. Wood is being assembled into terrace floors.

The Making

Together we began the process of transforming the alley into an urban garden organized around building activities. Children and youth participated in collecting wood, creating the terrace floors, assembling and painting the planting beds and making moss graffiti. Some of the more energized kids were instructed in taking down trees and using chain saws. It might seem reckless to invite exactly these kids into this kind of activity but it turned out to make sense to funnel their enormous energy into handling and cutting timber. The release of energy also enhanced their commitment to the process. The demanding physical activity like moving gravel and stumping the wood floor gave a great sense of accomplishment that was later confirmed in interviews to build from wood that they had participated in harvesting (Lamm, Wagner, Skaarup 2013).

It was a joint build process where kids, staff and researchers co-created the space united by a common goal. Organizing participation possibilities for the kids in the building process turned out to be a valuable experience for everyone. But the kids needed specific tangible tasks that yield immediate results and this required a strong facilitation. It helped the process when we organized building around social activities like making hot coco over the bonfire. Using wood made it possible to adapt design solutions on site.

The method had some interesting implications for the design process and particularly for learning about space through the act of hand crafting it. The making itself seemed to embed spatial knowledge and commitment to the new garden into the children on a much deeper level than had we only involved them through representational methods. Bench heights were tested and defined on site and mended together with hand held tools that the children could also manage. These small-scale hand crafted spaces point towards alternative design process and production methods through which we can learn about space itself. It also empowers and suggests that the definition of the public spaces is not only an authoritative gesture but something that we as citizens can take into our own hands – literally.

Several of the staff members of the youth club had craftsman skills that were instrumental for the construction phase. One introduced a historic building technique into the process by using dowels as an alternative to screws. The collaborative process we learned had been a valuable experience for everyone where children, staff and researchers worked together united by a common goal. The process had strong social value as everyone was learning about people and place making beyond social categories driven by a mutual goal.

This phenomenon of embodied learning is backed up by the anthropologist Tim Ingolds and his theories around “thinking through making”. As Ingolds states “in the art of inquiry, the conduct of thought goes along with, and continually answers to, the fluxes and flows of the materials with which we work [....]. Here, every work is an experiment: not in a natural scientific sense of testing a preconceived hypothesis, or of engineering a confrontation between ideas “in the head” and facts “on the ground”, but in the sense of prising an opening and following where it leads” (Ingolds 2013). The materials lead the way and the interaction with them enhances our awareness of our self and our environment.

The outcome was a robust and well composed garden space where the wood added warmth and a strong sense of forest to a rather unappealing urban site. At the opening in December 2012 the locals were invited for soup, movies and music in the garden.

After Instalment

The Youth club organized excursions to organic farms to learn about growing vegetables so they could apply the learnings in their own space. At a harvest party kids prepared vegetables over the bonfire and gained attention from the mayor who opened the event. Each event and experience has been a success, but it has been difficult for the club to keep the continuity of managing the garden. There was no one to water the planting beds over the summer and a renovation process of the adjacent building made access to the alley difficult.



FIGURE 3. Kids are learning about using tools.



FIGURE 4. The final garden space in winter.

In the following months we discovered that the youth club had started adapting and changing other areas around their location. They had experienced first-hand how simple it was to create useful spaces. A green patch was furnished with benches, flowers were planted by the entrance and a large asphalt area was marked with line for soccer. It seemed that the process of design building their garden had opened the possibility that space can be used and changed through own initiatives.

The garden is in an area of vandalism and at the beginning many anticipate that the wood would be torched. So far the site has been treated with respect, the fact that the kids have gained ownership through their active involvement we believe played a significant role in the garden remaining un-vandalised. Later we learned from the municipality of Copenhagen that other social initiatives have been unable to reach these kids. Therefore we were contacted by the municipality who wanted to learn how a co-creative building process can also create meaning, learning experiences and possibly social changes.

Potential of Hand-Made Spaces

Traditional methods of creating urban public outdoor spaces usually entail an extended and complex process of planning, programming, designing and constructing distributed out between many different professionals. The youth club project transformed an abandoned site suggesting alternative methods for utilizing places for communal use. The drafting table was replaced by a strong presence on site developing projects in a hand crafted process that allowed for adaptations to be made in the moment and facilitate a continuous process from initial idea to completed garden space.

Creating small scale public spaces that are instantly usable through enacting unused sites and local resources can act as a potent driver of not only place making but can also be a social driver of change. Through relatively low budgets and simple physical alterations we can transform sites and redirect the discourse of a place by involving people in making it. It can perhaps also support establishing resilient neighbourhoods through the engagement of local community in a co-creative process.

Acknowledgements

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References

- Ingolds, T. 2012. Making anthropology, archaeology, art and architecture, Routledge
- Lamm, B., Wagner, A., Skaarup K., 2013. Interview Klokkegårdens youth club
- Oswalt, P., Overmeyer, K., Misselwitz, P. 2013. Urban Catalyst: The Power of Temporary Use, DOM publishers, Berlin

River-Machine and Machines of the River

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rural landscape | design | water technology

River-machine and machines of the river are metaphors for a new landscape design approach that can operate on the territory through a multi scale analysis. The search field is Sardinia, in particular two different rivers characterized by extreme conditions of flux. Sardinia is defined by a fabric of small centralized villages, which are the base unit to control territory and its ecologies. The river represents an extraordinary example of large scale architecture, able to establish a relational network at different scales. The aim of the research is to define a framework of guide lines on Sardinian river landscape through a new approach that goes beyond the bureaucratic machine of prohibitions and buffer areas, but through a new approach to technology able to provide new spaces for social practices of the habitants. The countryside transformation of the last decades raise many questions on the development possibilities, in particular the tourist economy could deeply modify countryside uses. What is the answer of countryside in terms of multi-purpose? Could river equipment design be useful for it? What is the new meaning of river-machine?

This paper is based on a double parallelism, on the one hand river and machines, and on the other all river equipment that improve its operations and mechanisms, such as canals, dike, mills, and other type of equipment that work with river and let the river work better. The aim is to exploit a double face of the machine, useful for landscape projects through a multi-scale approach that makes it possible to keep in contact territorial influences of the river with the network of equipment's that work on a very small scale.

The machine metaphor follows a definition offered by Le Corbusier in his writings "Vers une architecture" and in "Sur les 4 routes", where he defines the machine as "a creation of highest purity, true to its mission that is to produce; the machine is strong because its actions are repeated with the same accuracy and efficiency; it is reassuring because its life is consecrated to take care of its work at all times" (Le Corbusier 1941: 93).

The metaphor of river-machine is directly linked to its ability to produce, and in this case, the production goes beyond the traditional water-mills or the energy produced by a contemporary hydroelectric power plant. In fact the metaphor can be extended to the territory, defining a geography continuously "fed" by its drainage basin. Facing the erratic dimension of rivers, the man has taken care of discontinuous conditions, and adapted their social practices following its behaviours. The village positioning reflects a sort of machine control through the management of social relations and border areas. The river has been an authentic territory maker. Operating on the machine is a very complex work, always in a difficult state of balance, often already unstable, where the

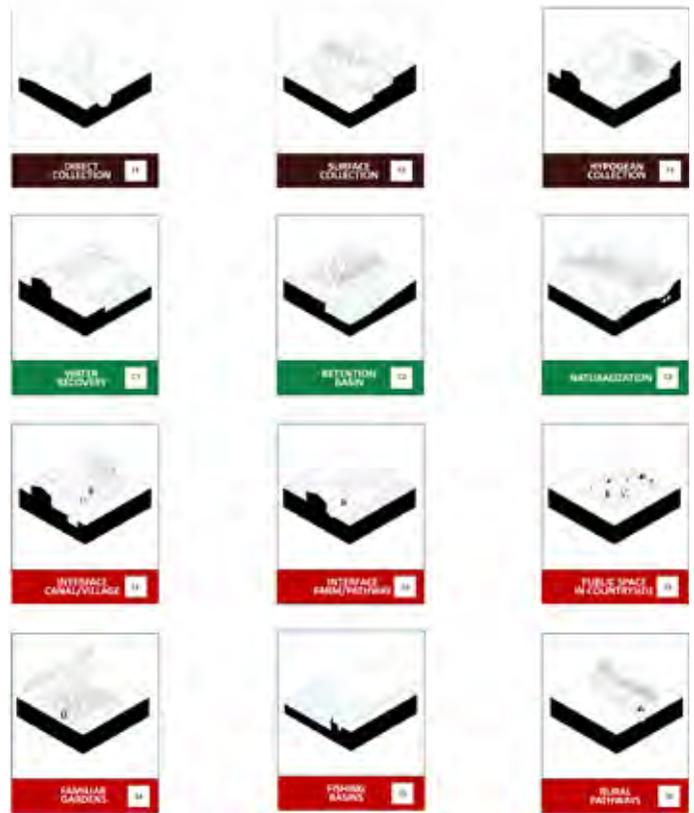
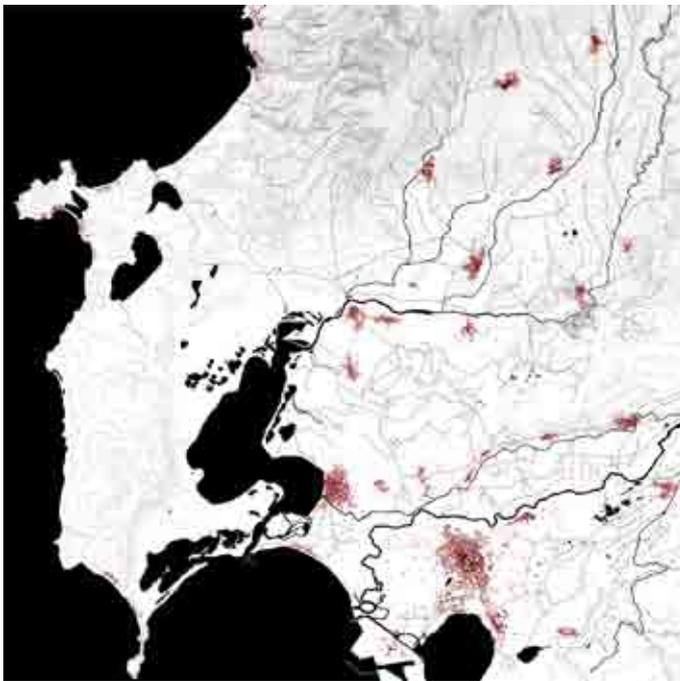


FIGURE 1. Map of river Tirso mouth area. The image shows the attractiveness of river in the area and densification of villages along a linear system ruled by flooding area of Tirso.

FIGURE 2. Matrix of technologies and spatial situations. The matrix combines traditional and modern techniques and different spatial situations. Guide lines are expression of different combination of matrix cells.

designer has to take a part with ethics and attention. “There is a machine ethics, the ethics of loyalty, of integrity, of accuracy, of obedience [...]; machines, steel, concrete, or glass buildings are sons and daughters of reason and calculation, it is not possible between them a rupture, the continuity is natural” (Le Corbusier 1941: 126).

The multi-scale nature of the river is balanced between its structure of territorial machine and its devices of territory management that make possible its operations. Landscape design can challenge the theme of the river in its double face function, working on them as territorial linear form already present in landscape, and working on its equipment as points along a line. The aim of the work is to define a framework of guide lines on Sardinian river landscape through a new approach that goes beyond the bureaucratic machine of prohibitions and buffer areas, but a very elastic system that reads the operations of the machine in order to better “produce” in a new realistic project dimension based on water as a design item.

River Thickness and Multipurpose Countryside

River thickness is the variable distance between the minor and major bed of a river, defined by the maximum measurement of historical flooding and alluvial soils. The concept of thickness represents the variability of river width, with its continuous dynamics. The study of thickness allows to define an interesting area of river influences, where it is possible to read the “operations of the machine”.

The thickness is characterized by different uses: specialized agriculture, sporting areas, natural wild areas. Lots of scholars talk about ecotones as a conjunction area between adjacent ecological zones with defined characteristics through the space-time scale and through the degree of interaction (M. Holland 1991). The ecotone is a permeable border, a place of exchange and confront between inside and outside (E. Turri 1998). This area is struck by contemporary transformations coming from urban pressure, modification dynamics of countryside and its opening to different uses by the community.

The project aims a new attention of technology in front of relationship between village and river through the reading of long time that historically ruled the relations and its new centrality for redefining the approach to fix machine. River equipment and their operation at the micro-scale become an important element for the regeneration of territorial scale system through an architecture device of large scale. With large scale architecture we intend a large territorial structure that operates through the work of small scale devices that allow a continuous relationship between the parts of the structure.

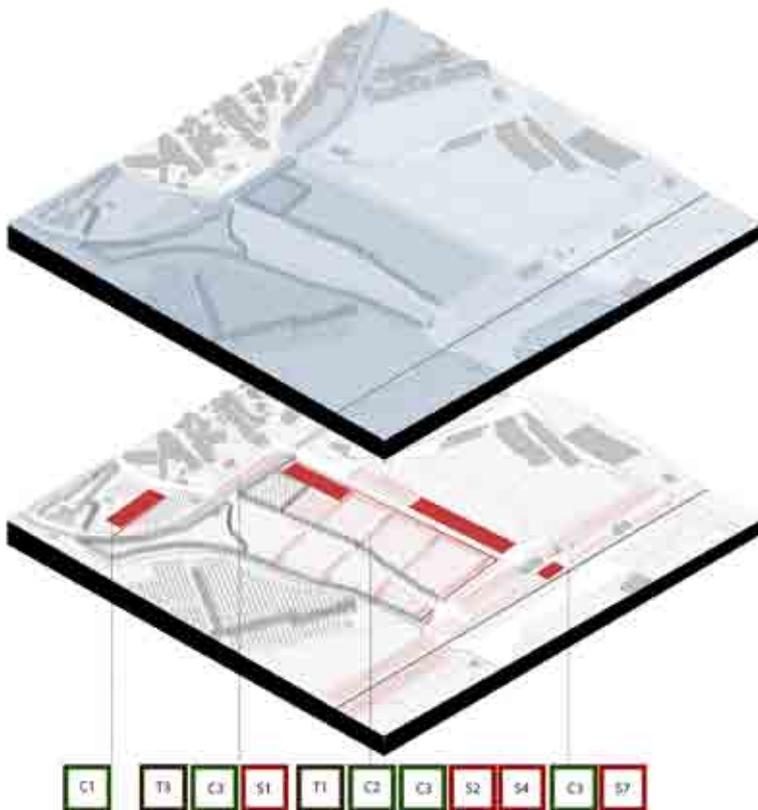


FIGURE 3. Solarussa case study. In 2012 Solarussa was struck by a flooding that caused lots of damages. Guide lines establish a system of retention basins and familiar gardens, that produce new public spaces for the border of the village.

The island of Sardinia offers in its rural landscape a series of examples of water management combining the multiple scales of intervention. The transformation and modernization of the countryside in XX century has modified the relationship between rivers, agriculture and villages, through new works of canalization, dikes, and retention basins in order to improve traditional systems. This modification has cut the relationship between river and villages with their habitants modifying the river bed and thickness. The choice of the case study deals with modification of river thickness with an analysis of two different rivers, on the one hand an inner river that crosses the mountains with a torrential behaviour, on the other hand the mouth area of a plain river that flows in the marshes of mid-west Sardinia. The multi scale approach, based on morphological analysis, aims to find the relationship between equipments and technologies of the river and its large scale in order to improve new design techniques and new spaces for the habitants.

Machine of the River and Spatial Machines

The need to operate on the machine could be an opportunity to design new spatial dynamics the in countryside. Traditional forms of architecture were able to generate quality spaces opened to different use programs, for example the techniques of terraces, used for managing land and water along a slope, became in different cases a place for living, for cultivating or for raising cattle. Facing the problems of climate change, the theme of water management solve a double question: the protection of the land when there is too much water and the collection when there is not enough. The new modern techniques of water control such as retention basins, recovery rainy water tanks, new re-naturalised areas can become a real opportunity of development for the countryside often in contact with urban borders, opened to multipurpose practices. The application of these new techniques in case study is strictly linked to their ability to produce places for the habitants.

Sardinian territories are opened to a tourist challenge that cannot deny their agricultural production and traditional practices but can start from this in order to develop a new kind of spaces with different possibilities of use. For doing that, water management and river equipment can be a real design items able to solve the problem of sudden water excess or a prolonged lack. Case studies show multipurpose possibilities of new space that combine the collection and distribution of water with different uses for social practices, such as exposition and market areas, leisure and sport activities, tourist accommodations and landscape observatories. Small scale is the key of new activities that have not the presumption to be a regional pole but working together in a collaborative network.

References

- Le Corbusier, *Sur les 4 routes*, Édition de Noël, Paris, 1941.
- Holland M., *Ecotones. The Role of Landscape Boundaries in the Management and Restoration of Changing Environments*, Holland, Marjorie M. (et al.), Albuquerque, 1991.
- Prominski M., Stokman A., Zeller S., Stimberg D., Voermanek H., *River. Space. Design. Planning strategies, methods and projects for urban rivers*, Birkhauser, Basel, 2012.
- Turri E., *Il Paesaggio come teatro. Dal territorio vissuto al territorio rappresentato*, Marsilio editore, Venezia, 1998.
- Viganò P. *Landscapes of water. Paesaggi dell'acqua*, Risma, Pordenone, 2009.

The Kunstgärtner ('Artistic Gardeners') of the 19th Century – Designers or Entrepreneurs?

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history | profession | landscape architecture | Switzerland | 19th century | plants

In the 19th century, 'Kunstgärtner' (artistic gardeners) participated in the design and construction of public parks and gardens. They not only participated in the planning and design of these sites, but in fact also proved capable of supplying their clients with a diverse offering of plants. These experts, who were instrumental in the development of the profession of the contemporary landscape architect, were active in a period in which the versatility of botanical rarities gained high value. In contrast to this, the aspect of design took on a less important role. With this premise in mind, this proposal investigates the relationship between art and craft in the context of garden design and landscape architecture in the 19th century. To illustrate this development in Switzerland, the paper takes a closer look at the exemplary work of the esteemed Zurich-based 'Kunst- und Handelsgärtner' (artistic and commercial gardeners) Theodor Froebel (1810-1893) and Otto Froebel (1844-1906).

This paper builds on the author's doctoral dissertation, defended in 2015 (Moll 2015).

Introduction

In Switzerland, the profession of landscape architecture as we understand it today remains relatively young. In contrast to its neighbouring countries, former European monarchies where garden designers had been leaving their mark for centuries, the garden culture of the democratic Swiss Confederation only came into full bloom with the appearance of the first public parks and a growing number of private gardens in the second half of the 19th century. Representatives of the emerging bourgeoisie were largely responsible for the latter. As clients, they displayed their wealth not only through the construction of bourgeois villas but also of stately gardens. The construction of these eclectically designed gardens demanded an ever-increasing number of species and cultivars. As such, plants – in particular exotics – played a key role in this endeavour; plants served as proper status symbols.

The 'Kunstgärtner as Designer and Plant Suppliers'

For the design of their gardens the landed gentry appointed so-called 'Kunstgärtner.' While these gardeners were not designers per se, they skilfully combined practical knowledge and techniques from various disciplines. Their training typically began with an apprenticeship to a master gardener at the beginning of their careers, and continued autodidactically in the direction of botany and planning.

Practical handbooks guided the 'Kunstgärtner' in matters of design. In general, the how-to manuals, popular at the time took on an important role in the 19th century. In addition to offering practical advice, the popular handbooks managed to achieve a common design language and also appeared in botany and horticulture. The first few pages of these publications usually contained practical instructions. Their authors agreed that despite the progress, which they had already witnessed in garden art, instructional handbooks were lacking on the subject. They thus wanted to give both laymen and experts guidelines,

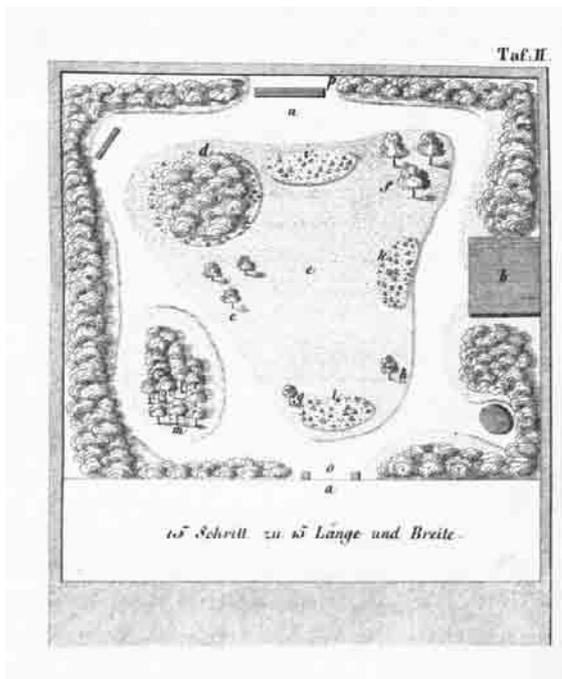


FIGURE 1. Design for a small private garden as proposed in a handbook dating 1863. (Ritter 1863, Plate II)



FIGURE 2. Otto Froebel, 'Entwurf eines Villengartens für Herrn Ingenieur Hans von Muralt,' Zurich 1897. (gta Archiv, NSL Archiv, NL Froebel)

which could assist them in the design of their own gardens (cf. i.a. Ritter 1836, Schmidlin 1852, Hampel 1894). Consequently, the modestly designed handbooks were made accessible (and affordable) despite the fact that they primarily contained plans and other technical illustrations. Nevertheless, they helped elucidate the written text and served as models for realizing individual designs, and in this way quickly gained relevance. (Figure 1)

In order to supply the preferred plants, the 'Kunstgärtner' often operated commercial nurseries in addition to already owning a tree nursery or greenhouses. An international network guaranteed a large assortment of plants and the acclimatization and cultivation of individual species further ensured the growing collections and desired variation.

The Swiss 'Kunst- und Handelsgärtner' (Artistic and Commercial Gardeners) Theodor and Otto Froebel

Theodor Froebel (1810-1893) and his son Otto (1844-1906) are two of the most important Swiss 'Kunst- und Handelsgärtner' of the 19th century. Their pioneering work paved the way for what is now the profession of landscape architecture – they are arguably two of the key figures in its very development. For this very reason, a closer look at their careers and built work reveals the rise of the 'Kunstgärtnerum' (artistic gardening) in Switzerland.

Theodor Froebel came to Zurich from his native Thuringia after completing his vocational training and education in 1834. Here, employed as the first university gardener, he contributed significantly to the planning and implementation of the new Botanical Garden. Soon after establishing himself as a self-employed gardener in 1835, he left the position at the university in 1841. Two primary occupations define subsequent developments in his career: public and private commissions for

the planning and implementation of green spaces and gardens, and the simultaneous establishment of his own business, including both a tree nursery and greenhouses. His son Otto completed his training within his father's enterprise as well as at several other renowned firms in Europe.

After Otto entered into the family business in 1865, the range of plants listed in their catalogues and the number of gardens commissioned and realized by the technical garden bureau expanded significantly. Toward the end of the 19th century, the Froebel 'Kunst- und Handelsgärtnerei' became the most significant in the country and even well known outside of Switzerland. One of the most distinguishing aspects of the Froebel's career paths is that neither the father nor the son ever received any official design education. This makes it clear that any skills necessary to complete design-related activities were learned autodidactically via the aforementioned instructional handbooks.

Diverse Responsibilities

For the most part, Theodor and Otto Froebel were concerned with the planning of numerous public parks and private gardens in Zurich. Pivotal for their work were not in the least the urban projects, which emerged as a consequence of Zurich's societal changes in the 19th century; the destruction of the city walls (Schanzenfall) and the opening up of the city beginning in 1830, its orientation from the river to the lake around 1880 and the first extension of the city boundaries ('Eingemeindung') in 1893. These three significant milestones for Zurich also impacted the activities of the 'Kunst- und Handelsgärtner': If the destruction of the walls led to commissions for the designs of public squares and parks, then the Froebels played a critical role in the development of the public green spaces along the Quay and, after the incorporation ('Eingemeindung'), received countless further commissions for the planning and implementation of private grounds in the city's new neighbourhoods. (Figure 2)

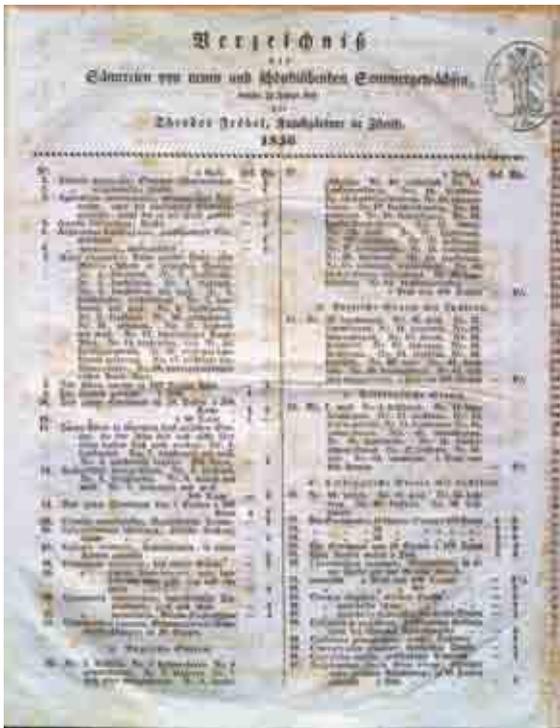


FIGURE 3. The first plant register published by Theodor Froebel in 1836. (CJB, Ville de Genève)

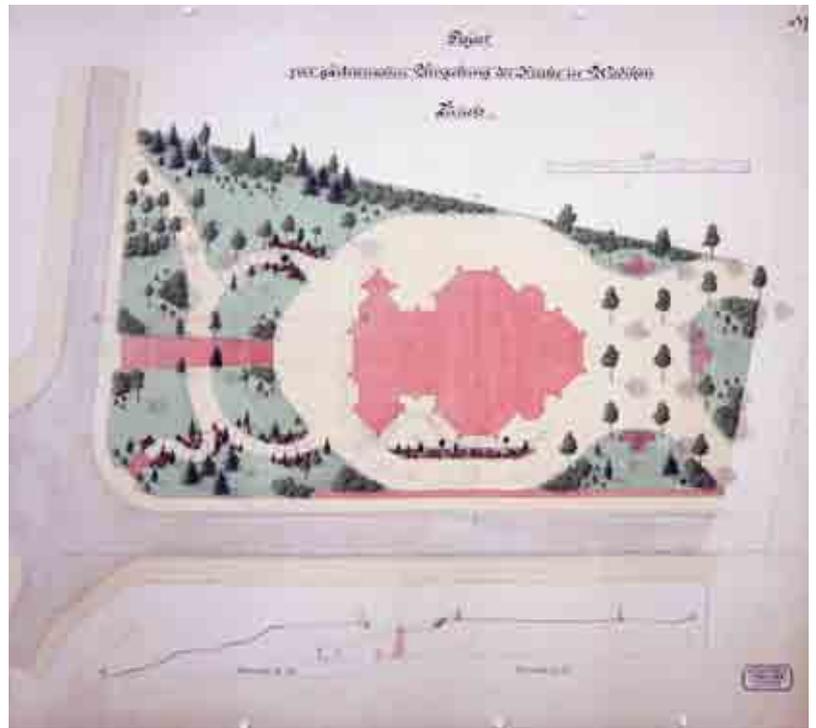


FIGURE 4. Otto Froebel, plan of the garden design for the church in Zurich Wiedikon 1896. (gta Archiv, NSL Archiv, NL Froebel)

The Importance of Plant Assortments

For many of their projects, it was not Theodor and Otto Froebel's capacity for design, which stood at the forefront. Rather, they distinguished themselves through their ability to provide the highly desired plant diversity of the times. The consistent expansion of the commercial garden becomes especially recognizable in the catalogues, which appeared in the final third of the 19th century. The registers feature an overwhelming amount of different plant types and species. In the early years however, the enterprise remained quite modest: By 1835 the father had managed, in addition to his main occupation as a university gardener, to implement two gardens in Zurich, set up an initial greenhouse, and establish a humble business. In the year following the establishment of the firm, Theodor Froebel published a preliminary plant register, which entailed for the flower garden some of the most sought-after blooming summer species at the time as well as other plants for the vegetable garden. (Figure 3) The register, which came out only two years later, presented a surprising diversity of plants, especially remarkable for the wide range of their origins. This rapid development continued in the following decades, seeing even further improvements from 1890 onward when Otto Froebel took over the family business from his father.

What becomes apparent is that both protagonists worked quite globally despite the fact that today's communication means were hardly available in the 19th century. Both father and son cultivated contact with countless commercial gardens and nurseries, botanists and collectors throughout Europe; expanding their plant assortment became both a personal and a business undertaking.

Gardens as a Stage for Plants

While Theodor Froebel may have been involved in relatively few projects as a designer at the beginning of his career, the number of commissions as well as the diversity of his plant assortment greatly increased in the following decades. Apparently, it even became fashionable among the wealthier families in Zurich to have a garden designed by the Froebels. And along with their designs, these entrepreneurs did not overlook the opportunity to commercialize plants from their growing collections. This supposition is supported by the fact that well into the 20th century garden designers were, if at all, often paid only for their designs of larger projects. In this regard, it is not surprising that the diverse plant lists recommended by the Froebels make it appear as though the demonstration of the business's plant assortment was a matter of the highest priority. Accordingly, Otto Froebel saw to it that no less than nine conifer genera and 46 different species and varieties were planted in the surroundings of the church in Wiedikon (1896). (Figure 4) For the garden at the Villa Henneberg along the Zurich Alpenquai (1898) he proposed ornamental beds with a vast array of unique rose species, which were likewise to stand in contrast to various conifers.

The Inheritance of Zurich's 'Kunst- und Handelsgärtner'

In part through their work and in part through their participation on various committees, Theodor and Otto Froebel greatly contributed to the development of the profession of landscape architecture in Switzerland. Moreover, their projects have largely shaped today's image of Zurich: the private garden for the industrial Wesendonck dynasty, known today as Rieterpark, is as defining an element in Zurich's green spaces as the 'Quaianlagen' wrapping the lake's edge. In addition, the

many majestic trees still towering in the former villa districts are reminders of the impressive plant assortment offered by the family business.

From these professional roots in the 'Kunstgärtnertum', self-identifying planners and designers emerged whose establishment became notable in a mere hundred years. And yet, even today landscape architects continue to question the defining identity of their own profession. Looking back to their forefathers to gain a deeper understanding of the roots of the profession may bring some clarity to these current and relevant questions.

References

Hampel, Carl: Hundert kleine Gärten, Berlin: Parey 1894.

Moll, Claudia: An den Wurzeln der Profession. Die Zürcher Kunst- und Handelsgärtner Theodor Froebel (181–1893) und Otto Froebel (1844–1906), Diss. ETH Nr. 22991, Zürich 2015.

Ritter, Carl: Schlüssel zur praktischen Gartenkunst, Stuttgart 1836.

Schmidlin, Eduard: Die bürgerliche Gartenkunst, Stuttgart: Hoffmann 1843.

London Marsh – Part C: City of London Peter-Joseph-Lenné-Prize 2014

MARTIN AUF DER LAKE | OLE CHRIST | CHRISTIAN RÖPER
SUPERVISION: CORNELIA MÜLLER

Osnabrück University of Applied Sciences, Germany

marshlands | transformation | habitat | orientation system | climate machine

The area between St. Paul's Cathedral and The Barbican Centre is characterized by big streets which interfere with pedestrian and bike connections between important cultural institutions. The goal of the competition was to develop ideas and planning concepts which would define these connections in a new way and create a multi-layered and encouraging urban environment which enhances the identity of the City of London. It should include possibilities created for green spaces, as a contribution to a sustainable development in this predominantly sealed environment.

The submitted project relies on the existing qualities of the marshlands as a historic landscape element and accesses this as a central motif. London's streets are broken up and replaced by marsh surfaces. Based on existing water areas marshlands are set as a unifying element and also made walkable with footbridges for pedestrians. The traffic is restructured, streets become pedestrian and bicycle paths with uniform flooring.

It is the strong, consistent idea of the design that particularly caught the attention of the jury, and convinced them. At the same time the jury sees this idea rather as a warning for future generations than a realization.

The jury honoured the design with the Peter-Joseph-Lenné-Prize in 2014 because of its outstanding character.

Project 'Competitio Practice' (Prof. Cornelia Müller)

Within the context of the Regulation on the Awarding of Contracts for Freelance Services (VOF), the architecture competition is a key decision criterion when it comes to awarding larger planning contracts. By participating in a competing procedure within the context of a student competition, the students become acquainted with the fundamental principles of design and presentation in a competition. The analysis of competition procedures and knowledge regarding legal framework conditions are elaborated within seminars.

In the summer and winter semester, the Osnabrück University of Applied Sciences for Agricultural Sciences and Landscape Architecture (A+L) offers this module for future landscape architects. It uses complex assignments in the form of public tendering within a prescribed time limit, its purpose is to lead to concrete solution approaches with regards to design and factual/technical aspects. The students acquire an overview and understanding regarding the instrument of an architecture competition.

Within the framework of this module, the Peter-Joseph-Lenné-Prize 2014 Part C: "City of London – the cultural backbone" was dealt with, and the task was awarded the 1st prize.

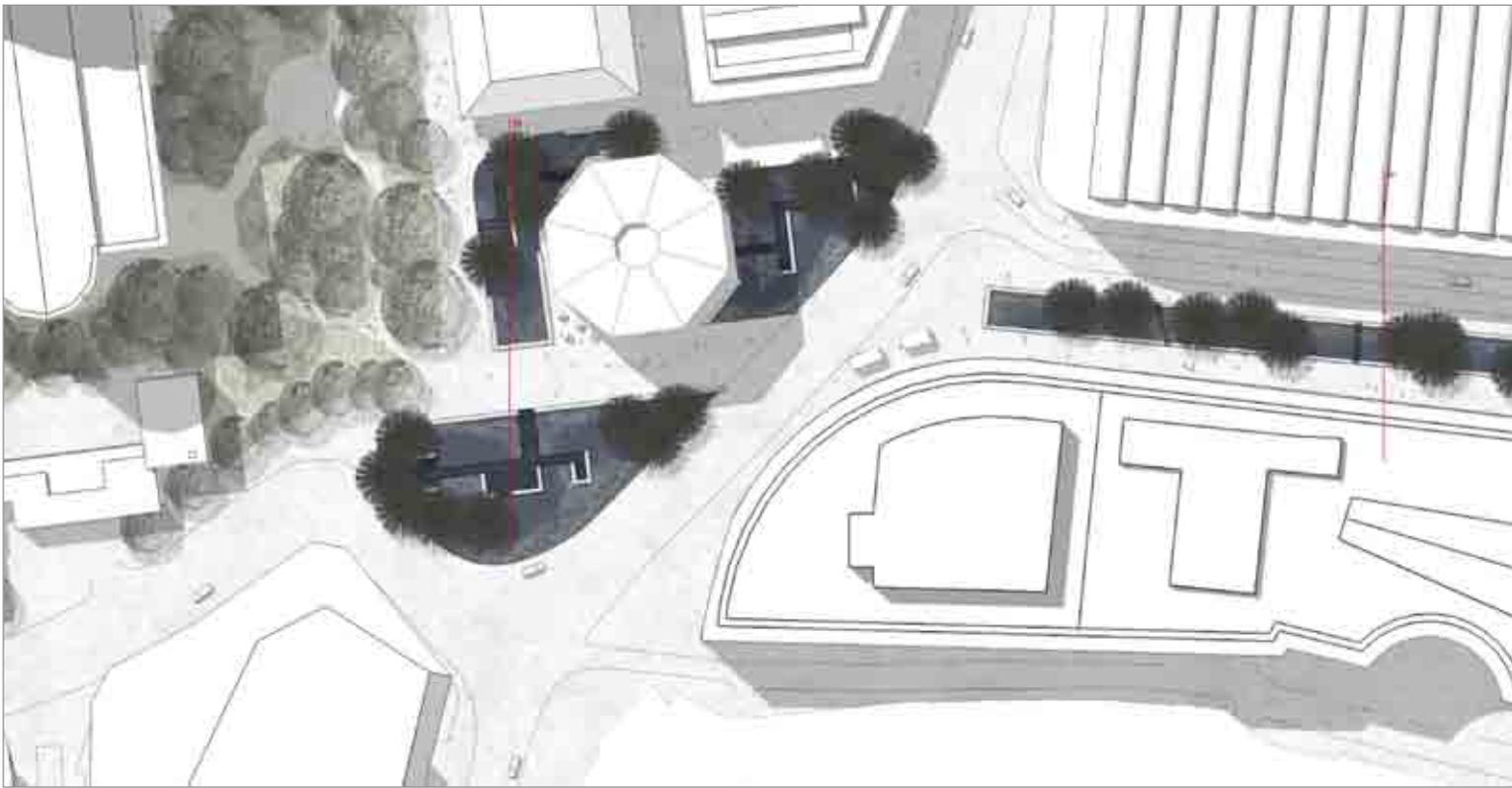


FIGURE 1. Detailed plan-site plan.

Peter-Joseph-Lenné-Prize 2014 – London Marsh

The marshlands of London constitute the motif of the open-space concept. London's streets are broken open to return the original landscape to the earth surface. Archaic elements within an urban context. Combined with the typical British copse landscape element, a walled-in piece of woodlands, as frequently seen in the cultivated English landscape. By these means, generous water areas are created, which will have their origin at St. Paul's Cathedral and the Museum of London. On the newly created boulevard between the two locations, they will continue in the form of long water basins, by means of which they serve as a connecting link. Footbridges break up the water surfaces and make them walkable for people. The walls of the copse invite the weary to rest.

So as to be recognised as a guidance system, the motif of the connecting water surfaces is continued in the form of dark paved areas up to the River Thames. By means of this, visitors are guided from Tate Modern to St. Paul's Cathedral to the Museum of London, to ultimately find the water in Barbican Centre as at the River Thames. The water is class and axis that holds together the dissected urban building situation. The traffic guidance of St. Martin's Le-Grand is traffic-calmed in favour of cyclists and pedestrians. In future, only delivery traffic will be allowed here. This allows the construction of a generously-dimensioned boulevard with a broad cycle path. The street will also be restructured in the Cheapside area. Now, pedestrians are no longer confronted with an unmanageable situation. Rather, they find themselves on a clearly structured space. Uniform floor covering emphasises the space situation. Passers-by have the choice of getting to the museum directly or acquiring a view across the Marshlands of London on the

footbridges across the water surfaces. An urbanised dialogue between culture and nature is thus created.

The concept of the transformed Marsh: habitat, orientation system, climate machine. So as to offer insects a habitat and food, only indigenous plant species are used, and plants needed by dragonflies for reproduction and metamorphosis are given preferences within the concept.

Reeds represent the main component of the plant concept and are part of the orientation system. Views are created or obstructed with meticulous reed arrangements. For pedestrians, the visual axis between St. Paul's Cathedral and Museum of London is emphasised. On the other hand, car drivers on the redesigned street between Cheapside and New Change have no view on the areas predestined for passers-by and, at the copse area, are accompanied by high reed vegetation. As such, a clearly-recognisable street scene is created, despite the uniform pavement. What is more, the reed plants serve the purpose of creating resting places within the water and marsh areas. For tourists and the workforce of the City of London, it serves as a place of retreat from the hectic street bustle of the metropolis. The greening in man's measure consists of reed-like plants such as bulrushes and rushes, as well as smaller plants like water knotweed or cotton grass.

Larger water surfaces will be covered by water lilies and frogbit. So as to provide the plants with the habitat they need, the depth of the basin will be adjusted to the ideal level in the greening areas. Here, e.g. water lilies can stand quite a bit deeper than the plants which are actually nearshore plants.

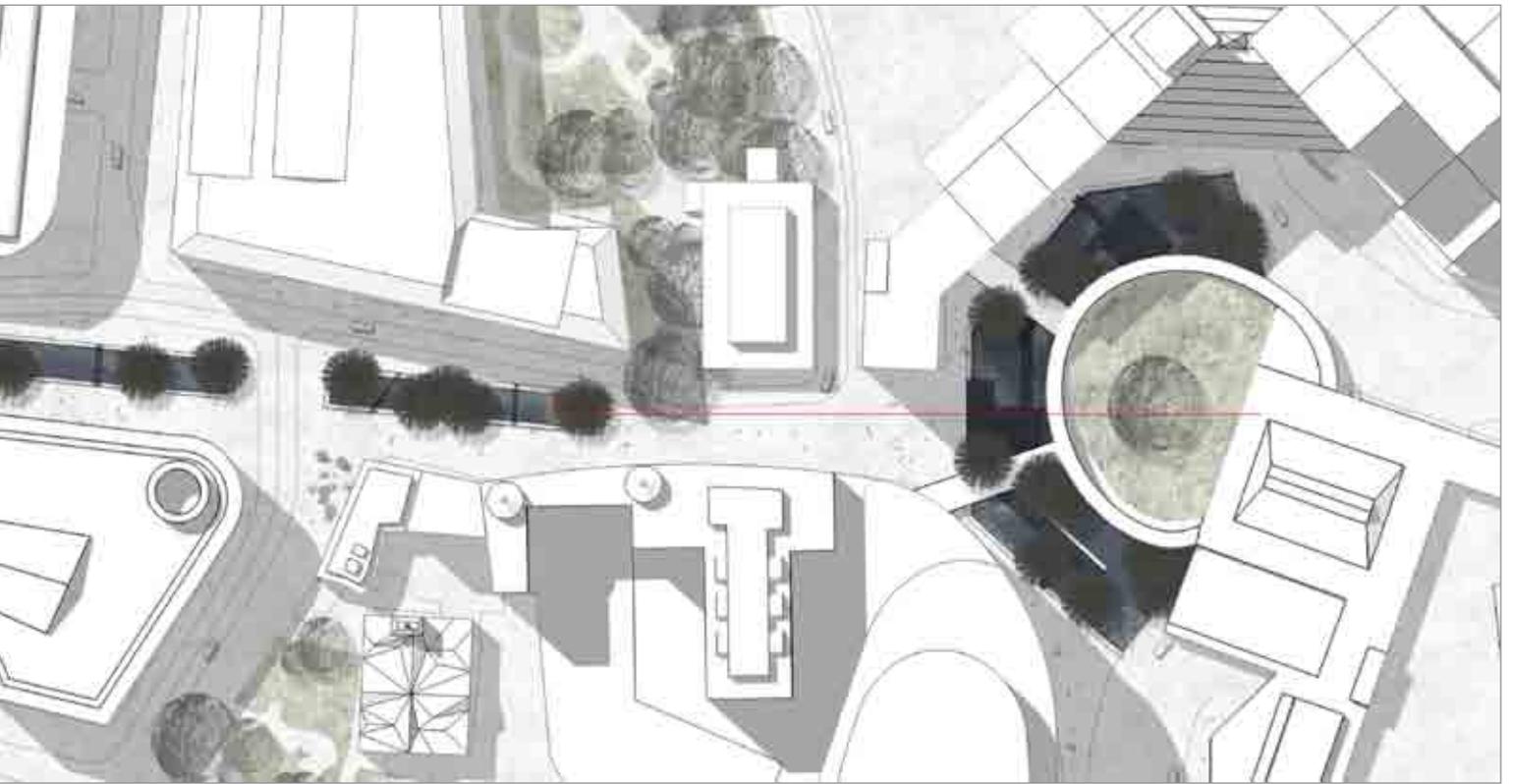


FIGURE 2. Sectional view

The swamp cypresses provide the most conspicuous element of the orientation system for the urbanity of the greening which, apart from the clear connection between the Museum and the Cathedral, ensures mediation between the scale of the built city and its inhabitants. The swamp cypresses are the only exception in the selection of indigenous plants and underscore the intercultural position of London. Its broad site amplitude, long lifespan and exceptional resistance make it an ideal urban tree. It develops the distinctive cypress knee in the course of time. The shimmering shade of the swamp cypresses ensures an atmospheric play on the plaster, by means of which spaces are created within spaces.

GIS-Applications in Landscape Design and Research

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GIS | landscape design research | composition |
digital media | design knowledge

There is evidence that the potential of GIS is still underutilized in landscape design and research due to a lack of awareness and prejudice. This paper explores some concepts of GIS-based analysis which link to the very heart of landscape design in a natural and intuitive way. Hence the possibility to break down barriers of using GIS in landscape architecture this paper aims to put forward some characteristic principles of study and practice that can be made operational via GIS while cultivating spatial intelligence in landscape design through exploiting its powerful integrating, analytical and graphical capacities. In this respect educational and research institutions must take the lead in knowledge acquisition on GIS-applications and passing it on, contributing to the academic underpinning and development of a digital culture in landscape architecture.

Introduction

Despite its widespread availability there is evidence that Geographical Information Systems (GIS) are underused in the realm of landscape design. Though recognized as a useful tool for mapping and planning, the potential of GIS in landscape design is often still underutilized due to a lack of awareness and prejudice. Knowledge development and dissemination of GIS-applications in landscape design are important in raising the awareness of the potential of GIS and an important basic condition for implementation in design research, education and practice. This paper explores some concepts that can bridge the gap between geo-information technology and landscape design by using the design perspective as point of departure. Hence the possibility to break down barriers of using GIS this paper aims to put forward some typical ways of understanding landscape design that can serve as gateways to GIS-aided knowledge acquisition and practical applications.

Landscape Design Research

Landscape design is next to landscape planning and management, an important object of knowledge in landscape architecture. The basic premises is that design can be considered research or a culture of thinking. Here landscape design is defined as a form of practical research aimed at the systematic acquisition of knowledge directed to specific practical objectives. This requires a multi-layered understanding of landscape. Hence, over time a repertoire of principles of study and practice typical for landscape design has been developed to understand landscapes as four-dimensional constructions, as history, as scale-continuum and as process. Particularly the products of design – landscape architectonic compositions – embody a great wealth of design knowledge regarding the application of these principles and their interplay. These compositions carry knowledge about how to satisfy certain requirements, how to perform tasks, and it is a form

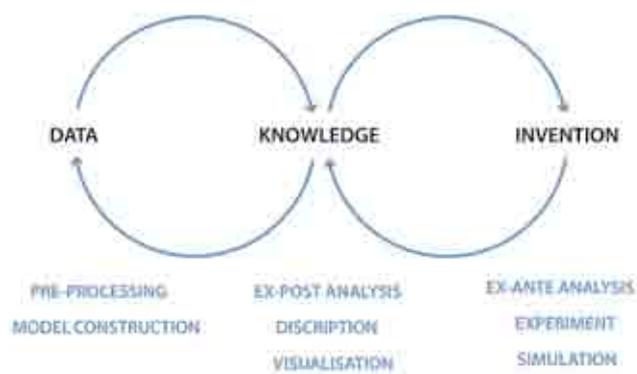


FIGURE 1. GIS as a facilitator and mediator in the knowledge formation-cycle and design generation-cycle: an iterative process from data to knowledge, from knowledge to invention. (Source: S. Nijhuis 2015)

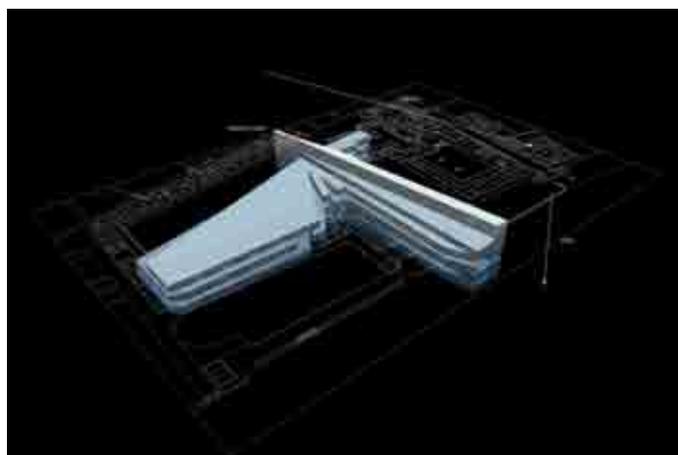


FIGURE 2. GIS-based visibility analysis in which successive fields of vision are calculated from the entrance to Piazza San Marco, Venice (Italy). Known as a Minkowski model, it shows from top to bottom how the square 'unfolds' – from a tightly framed view of the water to a view of the entire square. (Source: S. Nijhuis 2015)

of knowledge that is available to everyone (cf. Cross 2006). By studying landscape architectural compositions landscape architects can acquire knowledge of the possible relationships between conceptual thinking and the three-dimensional aspect (Steenbergen & Reh 2003). Landscape design research is a vehicle to acquire knowledge of spatial composition via architectural plan analysis. It is a matter of developing spatial intelligence, the architectural capacity or skill to think and design in space and time. In short: understanding is the basis for intervention. This implies that landscape design research is at the core of landscape architecture.

GIS-Applications in Landscape Design Research

There are at least three operations in which GIS could be useful for landscape design research (Nijhuis 2015):

- GIS-modelling: description of existing and future landscape architectural compositions in digital form;
- GIS-analysis: exploration, analysis, and synthesis of landscape architectural compositions to reveal new or latent architectural relationships, while utilizing the processing capacities and possibilities of computers for ex-ante and ex-post simulation and evaluation;
- GIS-visualization: visual representation of landscape architectural compositions in space and time in order to retrieve and communicate information and knowledge of landscape design.

These operations have a great potential for measurement, simulation and experimentation of landscape architectural compositions at different scale levels and offer alternative ways of understanding them. In this respect GIS can be used as a vehicle to explore the relation and interaction between data, knowledge and invention (Figure 1). In particular while using the typical principles of study as a point of departure for computer-aided design analysis a 'toolbox' emerges for GIS-applications in landscape design research. This toolbox consist of a set of GIS-based analysis methods and techniques stratified according the typical principles of landscape design. In that way concepts of GIS-based analysis can be linked and deployed in accordance with the experience of landscape architects.

(I) Understanding Landscape Architectonic Compositions as Four-Dimensional Construction

This principle focuses on GIS-applications for exploring the composition 'from the inside out', as it could be experienced by an observer moving through space using concepts of GIS-based visibility analysis (e.g. viewsheds, isovists) and virtual 3D-landscapes. GIS is employed to explore the visual manifestation of open spaces, surfaces, screens and volumes, and their structural organisation and ordering principles. The basic premise is that the shape of space, plasticity and appearance of spatial elements in the composition determine the relation between design and perception. GIS-based landscape design research addresses the form and functioning of the three-dimensional landscape space, with routes as important operative structures that mediate or facilitate its use and reception. GIS is employed to study the framing of a landscape or urban panorama, or the construction of a spatial sequence along a route (Figure 2).

(II) Understanding Landscape Architectonic Compositions as History

GIS-applications focus on 'reading' the landscape as a biography, as a palimpsest that evidences all of the activities that contributed to the shaping of that landscape. The composition is regarded as a layered entity where traces that time has laid over can reinforce or contradict each other. Knowledge of these layers is the starting point for new transformations, or adding a new design layer. This principle involves the evolution of the composition over time and investigates operations of 'erasing' and 'writing' history. Here GIS is employed to get to know the historical situation and the development of the composition. Via the construction of GIS-based virtual historical landscapes of a certain time-slice snapshot or comparisons of several of them the dynamics and change over time can be explored (Figure 3).

(III) Understanding Landscape Architectonic Compositions as Scale-Continuum

In this principle the focus is on GIS-applications addressing the composition as being part of a scale-continuum. The level of

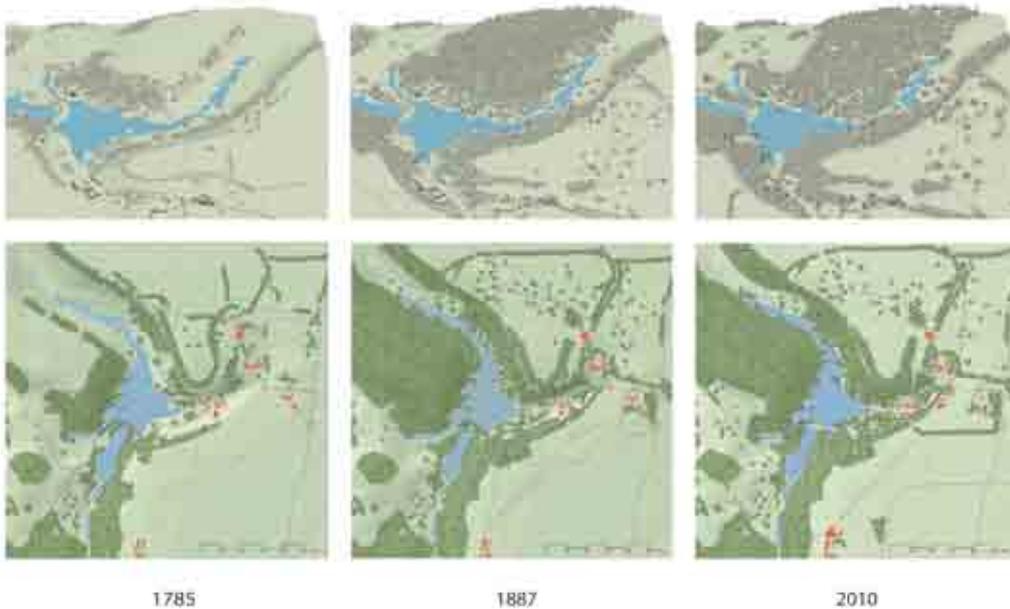


FIGURE 3. GIS-based reconstructions of Stourhead landscape garden (Wiltshire, UK) in different time stages of its development represented as virtual 3D landscapes and maps. (Source: S. Nijhuis 2015)

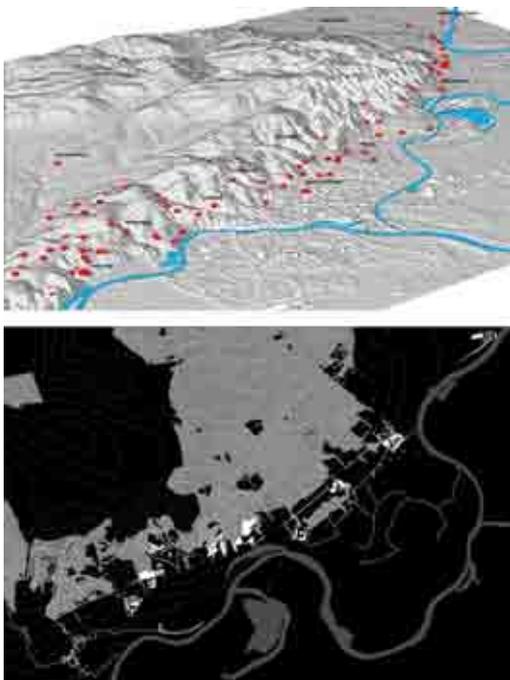


FIGURE 4. GIS-based spatial association analysis of the distribution and allocation of historical estates of Guelders Arcadia (near Arnhem, Netherlands) in the natural landscape dominated by the ice-pushed ridges of the Veluwe-East (top) and analysis landscape architectural compositions of selected individual estates that show a remarkable sensitivity towards natural conditions. (Source: S. Nijhuis)

scale of a composition under study is important, because any size larger than that of the study area supposes a 'larger context'. The composition is considered to be a relational structure connecting scales and spatial, ecological, functional and social entities. GIS-applications focus on exploring topological (vertical) and chorological (horizontal) relationships, the embedment of a specific site or location into the broader

context at different scale levels. Here spatial patterns are studied by map dissection as a basis for spatial association analysis, which explores the relation between different patterns. Here GIS is employed to explore for instance the position of the designed landscape in its natural, cultural or urban context on multiple scale levels. (Figure 4)

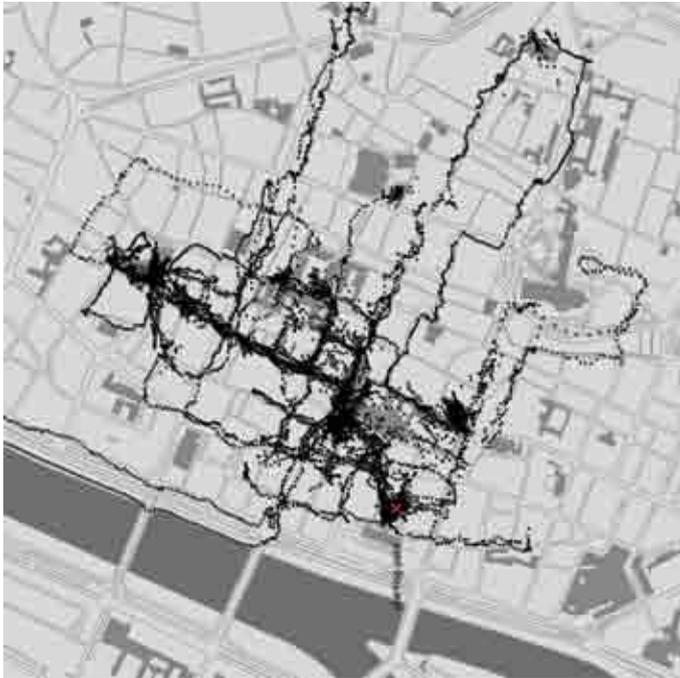


FIGURE 4. GPS-monitoring of pedestrian movement by tourists in Rouen (France). In order to reveal their movement behaviour several dozens of tourists were asked to carry GPS-devices while visiting the town centre, here represented as a map. (Source: S. Nijhuis 2015)

(IV) Understanding Landscape Architectonic Compositions as Process

GIS-applications focus on the interaction between landscape processes and typo-morphological aspects and address aesthetic, functional, social and ecological relationships between natural and human systems. The composition is regarded to be part of a holistic and dynamic system of systems as an expression of the interplay between formal aspects and interaction between ecological, social and economic processes. The landscape is considered as an ongoing process rather than as a result. Natural and social processes constantly change compositions, making the dynamics of the transformation a key issue in research and design. Here GIS is employed to understand the landscape as a system employing ecological process models investigating the spatial development and expression ecosystems, or exploring pedestrian movement patterns using GPS-devices (Figure 5).

In Conclusion

The briefly discussed principles for GIS-based landscape design research are not about presenting new GIS-analysis methods and techniques. It rather re-presents useful GIS-concepts from the perspective of landscape design. Hence, this toolbox embodies a way of thinking typical for landscape design and offers the possibility to link concepts of GIS-based analysis to the very heart of landscape architecture in a natural and intuitive way in the hope to break down barriers of using GIS in design study and practice. The typical principles of landscape design can also serve as a basis for cultivating spatial intelligence by means of geo-information technology while raising awareness and take away prejudice. It can serve as a basis for the academic underpinning and the development of a digital culture in landscape architecture exploiting GIS its powerful integrating, analytical and graphical capacities. Educational and

research institutions have an important part to play, they must take the lead in inspiring students and practitioners, building up their knowledge and passing it on, and adding new tools to the traditional craftsman's toolbox.

References

- Cross, N. (2006) *Designerly ways of knowing*. London, Birkhäuser.
- Nijhuis, S. (2015) *GIS-based landscape design research. Stourhead landscape garden as a case-study*. TU Delft, A+BE.
- Steenbergen, C.M. & Reh, W. (2003) *Architecture and landscape. The Design Experiment of the Great European Gardens and Landscapes*. Basel, Birkhäuser.

Processes in Formation: Ecological Performance and Landscape Aesthetics

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ecology | process | pattern | performance | form

As an instigator of the agenda of sustainability since the 1960s, ecology has been often turned into a promoter of problem-solving strategies, normally formulated as processual methods. In parallel, the rise of chaos theory in the 1970s emphasized process-oriented ontologies that eventually percolated ecology as indeterminate, unpredictable, and open-ended evolutionary narratives about the environment. Today, the high relevance and public visibility of ecology and its associated problem-solving approaches and uncertainty discourses has produced a general shift towards 'ecological performance' in landscape architecture discussions – landscape as agent capable of carrying out work, and landscape as event that unfolds – for which 'process' is a central concept. The rise of ecological performance and ecological processes has generally been at the expense of the interest in form and aesthetics and, consequently, of the interest in the ability to communicate through landscape design. This paper presents the concept of 'pattern' vis-à-vis the concept of 'process,' and discusses the possibility of patterns to provide the ecological premises of dynamic adaptation and environmental optimization with a much needed attention to landscape form and legibility.

For a few decades now, the continuous move into positions of high cultural significance has eventually turned ecology into a fundamental reference for contemporary landscape architecture's design. Since the rise of environmental concerns in the late 1960s, ecology has been utilized as instigator of the establishment of the sustainability agenda. Through this lens, the capacity of ecology in the design disciplines is often degraded to the promotion of problem-solving strategies, which are normally formulated as processual logics. In parallel, the rise of chaos theories in the 1970s brought a new accent on process-oriented ontologies that eventually percolated ecology, in the shape of new environmental interpretations that privileged indeterminacy, unpredictability, fluidity, and open-endedness.

The influence of these ecologically grounded problem-solving approaches and uncertainty discourses has produced a general shift towards 'ecological performance' – the former account for today's view of landscape as agent capable of carrying out work, the latter present landscape as becoming, as an endless evolutionary event – in today's landscape architecture discussion, for which 'process' is a central concept. While ecology and its associated process-based thinking has enriched and expanded the field of landscape architecture, its rise has been also detrimental for questions of form and aesthetics. This essay argues that, in order for ecology-driven landscape architecture to expand its social and cultural associations, the question of formal legibility needs to be re-examined (Figure 1). By turning to the field of landscape ecology and its dialectical opposition between 'processes' and 'patterns,' and by looking at the work of landscape architect Michel Desvigne as an illustrative example, the essay focuses on the discussion of the concept of 'pattern' as an intellectual and operative design agent that provides the ecological premises of dynamic adaptation



FIGURE 1. Satellite image of agricultural fields in Baza, Granada, Spain

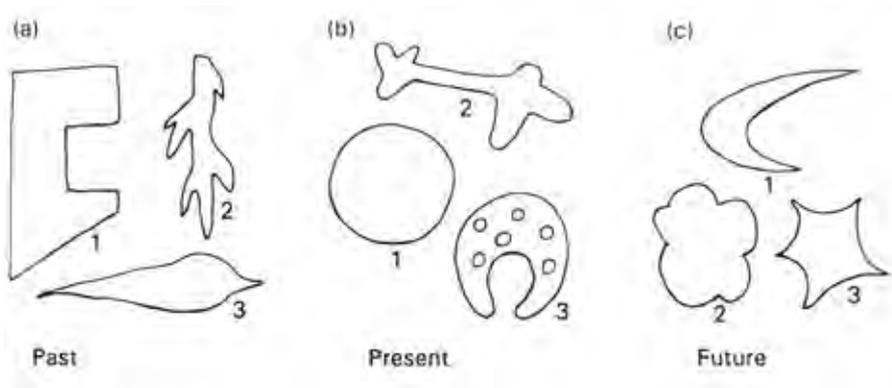


FIGURE 2. Past, present and future moving patches, by Richard Forman

and environmental optimization with a much needed attention to landscape form and legibility.

Dynamic Adaptation

Rather than fixed, patterns are open and dynamic structures and, as such, they are capable of responding to the constantly changing conditions of the environment. This connection between structure and change is key to landscape ecology, the sub-discipline of ecology that focuses on the ecological implications of landscapes' spatial heterogeneity (Turner 1989, Forman 1995, Turner et al. 2001). More precisely, three main landscape characteristics are considered in landscape ecology studies: structure – landscape patterns, the spatial relationships between distinctive ecological components – function – ecological processes, the interactions between different components – and change – the evolution of patterns and processes through time (Turner 1989).

When analysing landscape change, landscape ecology often turns to cybernetics to propose that there is an ever-adapting feedback loop between patterns and processes where the difference between causes and effects gets blurred: processes produce patterns and patterns determine processes. Richard Forman, following D'Arcy Thompson's 'form is a diagram of forces' (Thompson 1917), has discussed how today's landscape forms are produced by past flows: "the curving sand dune was shaped by the wind, the rectangular vineyards by tractors, and the dendritic stream corridor by water erosion" (Forman 1995, 5). Conversely, Forman also maintains that it is possible to read ongoing processes by looking at present patterns in the landscape (Forman 1986) (Figure 2). Along similar lines, Monica Turner has argued that landscape ecology's focus has been on how ecological processes produce patterns, and that now the emphasis should be in the better understanding of the effects of landscape patterns over future processes (Turner 2001, Turner 2005), a shift with strong implications in design.

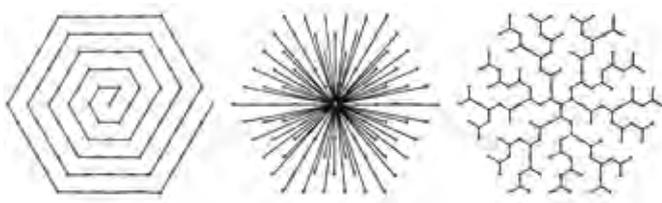


FIGURE 3. Spiral, explosion and meandering patterns over hexagonal matrix of dots

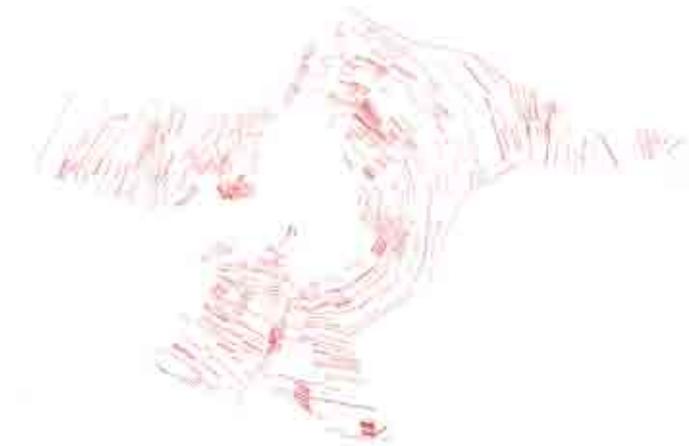


FIGURE 4. Map of a land survey in the city of Issoudum, France, by Michel Desvigne

Ecological Optimisation

Patterns respond to the sustainable quest for optimisation, for they frequently emerge out of mechanisms of formation. Sanford Kwinter has referred to mechanisms of formation as processes by which discernible structure is dissociated from a less finely-ordered field (Kwinter 2007). Heterogeneity is always the result of an energy input – without energy, systems become increasingly disorganized. But in order for discernible structures, order, patterns, to simply ‘emerge’ out of a disorganized field, it is necessary that those configurations are achieved through a very low consumption of energy. From all possible forms that could exist without human input, the evolutionary pulse of nature produces all its variety from the combination of a very few basic patterns, which are those achieved with the minimum use of energy.

Spiral and explosion patterns, for example, represent two extremes of energy optimisation: spirals are the shortest possible path way to cover an area, and explosions are the most efficient way to connect one single point with a set around it (Stevens 1974: 39) (Figure 3). As intermediate situations, branching and meandering patterns are structures that negotiate the tortuous morphologies of spirals of explosions. Patterns are often efficiency agreements between different sets of internal relations. As art theorist Gyorgy Kepes explained, “when the wind traces impact on the sand into waves and drifts, the sand pattern is not only a passive record of the wind’s activity; it is an active “contour” which both separates and connects the force of the wind and the resistance of the sand. It is not wind, nor is it sand; it is something new” (Kepes 1956: 206). The pattern, then, is the *interface* – the moment of negotiation – of wind and sand (Berrizbeitia 2016).

Formal Legibility

Patterns are legible, for their visual configurations – although often intricate and complex – is the result of the redundancy of a set of simple formal themes. The greatest interest of patterns as design tools may lie in their capacity to accommodate spatial variation without losing aesthetic consistency and formal identity. In conditions of structural complexity, which are, as we have seen, often the result of energy optimisation strategies, patterns allow to extract legibility through the detection of fragments of recurrent information, which are later manipulated systemically as formal operators still capable of responding adaptively to environmental information.

This thinking can be easily read in the design work of Michel Desvigne, which responds to a constant aspiration to give legibility and meaning to the landscape through the use of geometrical patterns. Desvigne’s geometries allow not only the reading of the landscape’s spatial structure but also the reading of the evolution of landscape in time. Philosopher Gilles Tiberghien has written of Desvigne’s work that “the drawing plays a role that is at once descriptive and analytical – it is an instrument for visibility that makes it possible to understand how a landscape is made. But at the same time, it plays a ‘constructive’ role since (...) it creates the very thing that it unveils” (Tiberghien 2009: 154). Although his work is highly formal, form never takes precedence. Desvigne’s designs borrow from existing landscape configurations that were moulded by processes in the past, to be then ‘constructively’ adapted into legible patterns that are projected into the future for the unfolding of new processes. (Figure 4)

References

- Berrizbeitia, Anita. 2016. "On the Limits of Process: The Case for Precision in Landscape." In GSD Lectures. <http://www.gsd.harvard.edu/#/events/lecture-and-conversation-anita-berrizbeitia-mla-87-with-michael.html>, accessed on May 7th, 2016.
- Forman, Richard T. T. Land Mosaics: the Ecology of Landscapes and Regions. Cambridge; New York: Cambridge University Press, 1995.
- Kepes, Gyorgy. "Thing, Structure, Pattern, Process", in G. Kepes, ed. The New Landscape in Art and Science. Chicago: P. Theobald, 1956, 204-207.
- Kwinter, Sanford. "Who's Afraid of Formalism?." In Far from Equilibrium: Essays on Technology and Design Culture. Barcelona: Actar, 2007, 96-99.
- Stevens, Peter S.. Patterns in Nature. Boston: Atlantic Monthly Press, 1974.
- Thompson, D'Arcy Wentworth. On Growth and Form, 2nd edition. Cambridge: Cambridge University Press, 1959.
- Tiberghien, Gilles. "A Landscape Deferred," in Intermediate Natures: The Landscapes of Michel Desvigne. Basel; Boston: Birkhäuser, 2009, 151-158.
- Turner, Monica G., 1989. "The Effect of Pattern on Process." Annual Review of Ecology and Systematics, 20, 171-197.
- Turner, Monica G., R. H. Gardner, and R. V. O'Neill. Landscape Ecology in Theory and Practice: Pattern and Process. New York: Springer, 2001.

Application of Urban Metabolism Approach in Energy Landscape Design

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urban metabolism | energy transition | resource management | The Netherlands

Urban metabolism (UM) is a concept that has been approached mostly in technical, quantitative terms and at a large scale, lacking of spatial and qualitative components. At present increasing urbanization, combined with progressive resources limitation, leads us to consider UM as an approach to make cities more sustainable. Meanwhile landscape designers and urban planners begin to embrace UM for planning and design.

The paper analyses the spatial configuration of urban metabolism approach and inquires about its emerging design practice.

Two neighbourhoods are analysed and compared in Amsterdam (Netherlands) that apply UM approach in order to reduce material circulation and transit from fossil fuels, towards renewable and carbon-free sources: De Ceuvel, a neighbourhood lasting for ten years and City-Plot, a permanent one.

The case studies are developed through the analysis of the resulting landscape, design documents and interviews of landscape architects, architects and engineers.

With regard to landscape, the conclusion is that there isn't a defined landscape induced by the use of UM, because there are other variables that characterize the project. From the perspective of the designers practice, it's highlighted how this approach doesn't deeply change their roles and skills.

Introduction

The issues of climate change, depletion of fossil fuels and increasing urbanization has allowed many to recognize sustainability as a subject of major importance.

On this topic, UM is a concept that has been developed over the past years to study the complexity and impacts on the environment of urban systems (Wolman 1965). UM defines the total sum of processes for which cities mobilize resources, needed to make them work and develop, consuming resources and generating waste (Barles 2008).

Most UM studies are commonly lacking of a spatial dimension, for they only focus on the quantification of total inputs and outputs of urban systems (Kennedy 2007).

In energy transition framework, it advances a more careful thought about the actual urban linear functioning of 'take-make-waste', proposing a shift to a circular metabolism recycling resources (Broto et al. 2012) (Figure 1). This idea increasingly argues that UM can contribute to achieve a sustainable urban resource management through design, and that designers have a prominent role to play (Kennedy et al. 2011).

Therefore, the aim of the research is firstly to focus on landscape configuration of projects that have moved beyond the UM quantitative analysis, using it to guide a sustainable design, contributing to bring an inhabitants scale in urban projects. Otherwise, projects may be disconnected from spatial qualitative dimension, even if potentially high-performing.

The second aim is to analyse the design practice emerging in these projects lead by UM approach.

The method is structured according to case study research (Francis 2001) based on field-study observations, design document analysis and semi-structured interviews as a technique with rules able to provide meaningful insight (Kaufmann 2013).

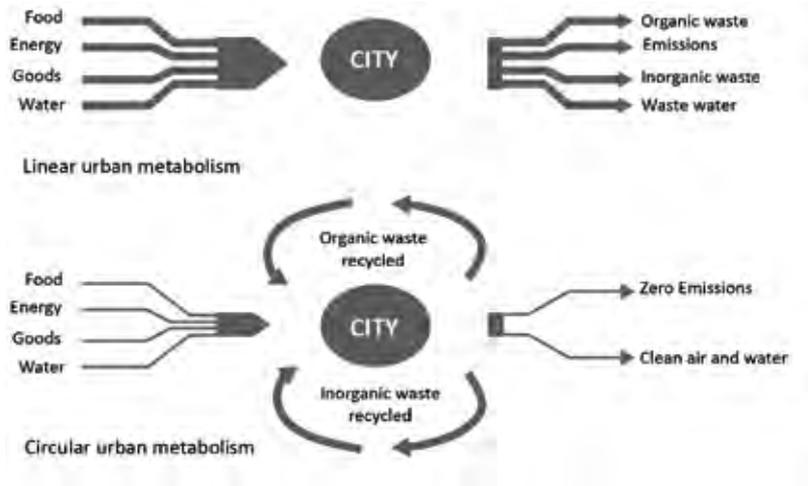


FIGURE 1. Linear urban metabolism and circular urban metabolism. Readapted image by the author on the basis of: Newman, P., Jennings, I., 2008. *Cities as sustainable ecosystems*. Island Press, Washington, 119.

Buiksloterham: UM in Project

The research examines two neighbourhoods, developed on this basis in the Netherlands, a nation where urban planning and policy have always had an important role and one that is engaged in energy transition processes, also through the implementation of experimental projects.

Amsterdam's neighbourhoods envisage a circular management of flows and they are developed by both technical-engineers and designers. The analysis is conducted at the neighbourhood scale in order to establish a link between resources management and spatial elements carrying them. The analysed flows are: energy, water, materials, waste and pollution. They stem from the "MFA", the principal quantitative method to calculate UM. These neighbourhoods are part of Buiksloterham district, an industrial and brownfield area for which the municipality has aims for a re-development in a sustainable way.

Here a consortium, also involving designers, has quantified the actual UM and created an UM resource model for the projected state in 20 years, to guide a sustainable future design for the area.

A Permanent Landscape

City-Plot is a permanent neighbourhood and an area of mixed-use. It's an ongoing project, so to consider the landscape elements dealing with the flows it is necessary to analyse design photomontages (Figure 2).

Water flows are being managed by landscape architects, making them elements around which public spaces are designed, achieved through visible above-ground rainwater system enchainning swales and storage pool. They also collaborate with architects to manage energy flows. Passive houses are planned and energy is produced through mini wind-turbines and photovoltaic panels on the buildings' roofs.

With regard to construction materials, recovered materials that can be reused, preferably after the building lifetime. The waste is managed through waste collection disposed by the municipality.

A Phytoremediation system is thought of for de-polluting a part of the plot ground, through the creation of non-accessible green

spaces designed by landscape architects.

City-Plot has a very mineral landscape that remembers other existing eco-neighbourhoods, as Clichy-Batignolles (Paris), based on a sustainable development basis, not revealing a new kind of design approach.

Considering City-Plot, the project is developed by a close collaboration between architects and landscape architects. Here, "the UM doesn't really give tools, but it's more a way of thinking" (landscape architects). Landscape architects also highlight how the rain-water flow management is based on the site characteristics, taking advantage of the natural inclination of the plot to enchain the different rain-water filtration systems.

An Ephemeral Landscape

De Ceuvell is a neighbourhood lasting for ten years, constituted by offices and workplaces (Figure 3).

The construction materials flow is the most characteristic one, because the offices are made with old boats retrofitted by architects and engineers collaborating with the future users, developing the project in a participatory way. The boats are placed on the polluted ground and connected by an elevated walkway. Here a phytoremediation system is set up by landscape architects: "the forbidden garden", managing the pollution flows by planting specific essences. After ten years the boats can be reused elsewhere, and the ground will be clean.

The neighbourhood isn't connected to sewage, so the grey water is filtered by bio-filter structures, very visible outside the office-boat, implemented by the environmental engineers.

The energy is mostly produced through photovoltaic panels and solar heating systems, placed on the boats' roof. Both electric cables and drinking water networks are placed under the elevated walkway. This one becomes a design structural spatial element and at the same time a flow infrastructure (Figure 4). The organic wastes are managed in a visible dedicated area to make compost, the others are collected to be recycled by the municipality. The resulting landscape is original and peculiar, with some disorienting elements as boat's, but at the same time green and pleasant.



FIGURE 2. Photomontages of City-Plot neighbourhood. Extracted from: Delva Landscape Architects, Studioninedots, De Alliantie, 2014. Cityplot Buiksloterham Amsterdam. Dynamisch Masterplan Openbare Ruimte, 22 and 28.



FIGURE 3. De Ceuvel neighbourhood: boat-office, bio-filter structure, elevated walkway on the "forbidden garden". Photos R. Pistoni, April 2015.

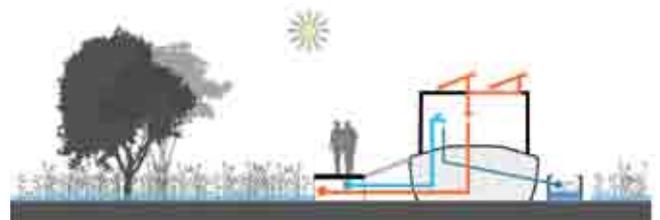


FIGURE 4. Section of De Ceuvel elevated walkway and boat-office: energy and water flows. R. Pistoni.

The project has been developed in a collaborative manner between designers and engineers but the dialogue is perceived as unsatisfying, underlining how "we had to struggle for the space" (engineer) and how "there were a lot of issues, and messy elements on the plot" (landscape architects). But at the same time, the importance of a collaboration among disciplines is recognized, stressing how the role of a landscape architect can be to link technical and aesthetical aspects during the design process. Furthermore, it is not perceived by both architect and landscape architects, as for City-Plot, that UM approach changes their design practice but "leads you to think in another way" (architect).

New Urban Landscapes?

The analysis of these two neighbourhoods shows how starting from the same concept of UM different urban landscapes are produced.

This is because there are other variables that make the project specific: design actors' decisions, the site adaptation, initial procurement. This is especially evident here because the same landscape architects worked on the two neighbourhoods. Their design practice is based on a site analysis that brings different elements at the centre of the project: the water for City-Plot and the phytoremediation biomass for De Ceuvel.

The different landscapes come from different spatial choices in the management of the same flow, too. For example, the rain water management of City-Plot is developed through storage-pool that organizes space. In De Ceuvel on the contrary water flow is visible through the bio-filter but they aren't elements structuring the neighbourhood as vegetal biomass.

When designers incorporate metabolic thinking a conscious resource management is integrated in urban design, even if the skills and role of designers don't really seem changed, and the kind of experts involved in the project are not different from any other project developed on the sustainable development basis.

However, a dichotomy among aesthetics and technique still occurs. This is well illustrated by De Ceuvel walkway that is used by engineers for water and electricity networks, but it was designed by architect and landscape architect with loops that aren't functional and efficient.

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References

- Barles, S., 2008. Comprendre et maîtriser le métabolisme urbain et l'empreinte environnementale des villes. *Responsabilité et environnement*, 52, 21-26.
- Castan Broto, V., Allen, A., Rapoport, E., 2012. Interdisciplinary Perspectives on Urban Metabolism. *Journal of Industrial Ecology*, 16(6), 851-861.
- Francis M., 2001. A case study method for landscape architecture. *Landscape journal*, 20, 15-29.
- Kaufmann J., 2013. *L'entretien compréhensif*, Armand Colin, Paris.
- Kennedy, C., Cuddihy, J., Engel-Yan, J., 2007. The changing metabolism of cities. *Journal of Industrial Ecology*, 11(2), 43-59.
- Kennedy, C., Pincetl, S., Bunje, P., 2011. The study of urban metabolism and its applications to urban planning and design. *Environmental pollution*, 159(8), 1965-1973.
- Wolman, A., 1965. The metabolism of cities. *Scientific American*, 213(3), 179-190.

Perspectives for Bridging the Gap Between Landscape Design and Research

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research in landscape design | trinity of design research |
research through design

In recent publications on research methods in landscape architecture, landscape design is addressed on a far lower level than planning, technology or history – there seems to be a gap between design and research in landscape architecture. This paper envisions new links between the two sides and will specifically address research methods closely related to landscape design. It starts with briefly discussing the trinity of design research and focuses on “research through design” in landscape architecture, where the design process itself is crucial for developing new knowledge. Two examples from the Studio Urbane Landschaften at Leibniz University Hannover, which integrate “research through design” perspectives, are presented and their potentials and limits for the production of knowledge are reflected. The projects express that “research through design” can play an exclusive and productive role in research. Yet, it has always to be embedded in larger framework which includes “research about design” and “research for design”. If this integration works, research which includes landscape design can fulfill highest academic standards.

An intensive debate on research methods in landscape architecture is currently happening in the academic community (e.g. Deming & Swaffield 2011; Lenzholzer et al. 2013), including the forthcoming “Research in Landscape Architecture – Methods and Methodology”, edited by Adri van den Brink, Hilde Tobi, Diedrich Bruns and Simon Bell. This is an important development to strengthen the position of landscape architecture in the research community. However, browsing the table of content in these publications, landscape design is apparently addressed on a far lower level than planning, technology or history – there seems to be a gap between design and research in landscape architecture. For developing links between these two realms, it is useful to reflect on the trinity of design research that was first proposed by Christopher Frayling (1993) and then further developed by Wolfgang Jonas (2012) or Lenzholzer et al. (2013). According to Jonas (2012: 23), “research about design” reflects design work from the distance without changing it, for example history, theory, or criticism. “Research for design” also operates from a distance and researchers are suppliers of knowledge for design work, for instance from the perspective of technology or social sciences. The third category, “research through design”, is the type of research in which the act of designing is the essential component of the research. Thus, the latter one is the research approach with the closest relation to landscape design. At the same time, it is considered ‘the most controversial category of research in landscape architecture’ (Swaffield and Deming 2012: 40). The main reason for controversy is the specific and projective character of design. Specific issues are difficult to translate into transferable knowledge, and projections are hard to evaluate, which makes it challenging to meet the standard criteria of research (and reviewers . . .). How is it possible to overcome these difficulties and to include the act of designing into the production of new knowledge? By analysing two

examples from the Studio Urbane Landschaften at Leibniz University Hannover, an answer should be outlined.

The first example is the research project “Designing urban nature” (Prominski et al. 2014). The project was funded by Deutsche Bundesstiftung Umwelt from 2012-2013. Its motivation derived from the fact that compensation measures, the result of environmental impact assessments, generate spaces which are often devoted solely to nature protection and exclude human uses. This leads to conflicts, especially in the urban realm, due to the limited availability of space, and sometimes even to acceptance deficits for nature protection itself. Thus, the following research question was proposed: Within processes of environmental impact assessment, how can nature compensation be combined with open space use to create multifunctional urban spaces?

Two partners with a practical interest were integrated in the research: the cities of Bremen [in German Freie Hansestadt Bremen, Senator für Umwelt, Bau und Verkehr] and Hamburg [in German Freie und Hansestadt Hamburg, Behörde für Stadtentwicklung und Umwelt]. Each partner had specific areas and spaces where they wanted to test the intermediate results of the research.

The project started by developing a theoretical basis as well as identifying and analysing best practice examples all over Germany. To be evaluated as best practice, projects in the urban realm had to demonstrate a multifunctional approach by fulfilling clearly defined nature conservation goals and allowing open space use at least in part of the project. The design strategies and tools we derived from these examples were provisionally systematized and abstracted into design guidelines. Until then, the research was solely “research about design”. Yet, this knowledge served as a basis for the designs in Bremen and Hamburg. In designing these two projects, we began by initially testing a broad spectrum of design strategies and tools. Our approach was to improve and expand on the provisional design guidelines as well as to invent completely new ones. Since the two design tasks in Bremen and Hamburg were broad and complex, they could play a significant role in developing transferable design guidelines. In summary, this phase of “research through design” played an important role in producing new knowledge which future users, who want to integrate nature protection and open space use, can apply in their designs.

The second example is the PhD ‘Designing Large-scale Landscapes through Walking’ by Henrik Schultz (Schultz 2014a+b). He started with research questions about how walking can foster the perception of space, how walking can stimulate insights and ideas for designing large-scale landscapes, and about whether there are rules for making design-oriented walking successful. He then embedded the questions in a scientific context including contemporary discourses in fields as diverse as large-scale landscape design, art, neurosciences, and geography. To answer his research questions, Schultz used two different research through design methods: first, he tested and reflected on his hypotheses in several design works of his own practice (he is one of the partners of Stein & Schultz, Frankfurt); second, he set up a design experiment with a group of landscape architects, urban planners, and geographers specifically for the purpose of his own research project. In the

end, through reflecting on the scientific context and the design results, he came up with two main findings: first, the model of a walking process for designing large-scale landscapes that includes the reflection mode, the discovery mode, and the flow-mode. Second, he proposes a set of rules that could work as guidelines for the successful designing of large-scale landscapes through walking. These results are relevant to the contemporary discourse in landscape architecture and represent transferable knowledge valid beyond the specific design case.

This analysis of projects with “research through design” approaches leads me to two conclusions:

1) The trinity of design research should be interpreted in a very permeable, loose way. The two projects discussed above express that a “research through design” approach should include “research about design”. Any design that should qualify as research needs a broader reflection from a theoretical, historical, and/or critical perspective. And in the end, the combination of “research through design” and “research about design” might also be “research for design” if it produces applicable knowledge for future design. So, let’s shake up the three design research categories and be open for cross-fertilization!

2) Research that includes “research through design” is not out-of-the-ordinary or controversial – it just fulfills all criteria of common research and its funding institutions. For example, the Arts and Humanities Research Council in the UK states in its demands of its applicants:

“Our primary concern is to ensure that the research we fund addresses clearly-articulated research questions, issues or problems, set in a clear context of other research in that area, and using appropriate research methods and/or approaches. . . . The outcomes of the research may only benefit other researchers and influence future research, but consideration must be given to potential opportunities for the transfer of knowledge into new contexts where the research could have an impact” (AHRC 2015).

Thus, all common research should include a research question and a reflection of the scientific context (in the language of design research: “research about design”), use appropriate methods (for example “research through design”), and advance and transfer knowledge (this could be understood as “research for design”). The two landscape-related research projects described above, which include “research through design”, both fulfil the criteria proposed by the AHRC (and also other research institutions like the German DFG): The design work is first embedded in a larger frame, which in most cases consists of addressing a research question and a study of the theoretical context that precede the actual designing. In addition to that, after the design phase a conclusion is drawn, which reflects the relevance of results for contemporary discourses and formulates transferable knowledge valid beyond the specific case.

Thus, I suggest that we stop lamenting the supposed difficulties in including design in funding applications or manuscript submissions. Instead, let’s integrate landscape design confidently into research proposals with the aim of investigating its unique methodological potential for particular research questions.

References

- AHRC, 2015. 'Definition of Research' [website], www.ahrc.ac.uk/funding/research/researchfundingguide/definitionofresearch/, accessed 04 May 2016.
- Deming, E. and Swaffield, S., 2011. *Landscape Architectural Research: Inquiry, Strategy, Design*. Hoboken: Wiley.
- Frayling C., 1993. "Research in Art and Design" Royal College of Art Research Paper #1 1993/4.
- Jonas, W., 2012. "Exploring the Swampy Ground". In: S. Grand and W. Jonas, eds. *Mapping Design Research*. Basel: Birkhäuser, 11-41.
- Lenzholzer S., Duchart I. and Koh J., 2013. " 'Research through designing' in landscape architecture". *Landscape and Urban Planning* 113, 120– 127.
- Prominski, Martin et al., 2014. *Urbane Natur gestalten. Entwurfsperspektiven zur Verknüpfung von Naturschutz und Freiraumnutzung*. Basel, Birkhäuser.
- Schultz, H., 2014a. "Designing Large-scale Landscapes through Walking". *Journal of Landscape Architecture* 9/2: 6-15.
- Schultz, H., 2014b. *Landschaften auf den Grund gehen. Wandern als Erkenntnismethode beim Großräumigen Landschaftsentwerfen*. Berlin: Jovis.

Design of Air

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airscape | atmosphere | void

The landscape is infinitely void from the Earth's surface through the sky to the scape of the Universe. This void within human scale is full of the air. Air is complicate as an art material due to its ephemeral and intangible nature and it is challenge to design the airdscape. Thus, the research question of this paper was: Can air in the landscape be designed, and if so, how? The aim of this paper was to identify diversity of air use as a material in landscape, architecture, interior design, arts and craft, beyond the boundaries of artistic disciplines and in habitual everyday use. The quantitative data selection of photos tagged 'air', 'atmosphere' and 'void' from social media networks was performed. Also the brainstorming and cognitive inquiry were accepted as appropriate to identify what humans do in and with air. As a result the list of cases were identified and systemized in groups with similarities. The results were analysed to enhance and generalise tools, mediums, design principles, material and artistic qualities of air as material for landscape design. The results of the study prove that air can be the design material and the airdscape can be designed. However the results were surprisingly diverse it feels as though there is still space for creativity and imagination to explore airdscape design by use of contemporary technologies and by borrowing knowledge from other disciplines. The research raises the potential to consider conscious use of air in design, the coherence of the air and the matter in the design.

Introduction

From the scale of the Universe the Earth is a matter surrounded by space or void. This void within the scale of humans living on the Earth is full of the air with an infinity of sky. The airdscape and skyscape could be defined through a method of positive and negative space, where positive space is volume of material landscape and negative space is void or volume of air and sky. The intrigue of this study is to revise the third dimension of landscape – what is above 'surface of forms sculptured by the nature and human' (Sauer 1925).

Air is complicated as an art material due to its ephemeral and intangible nature and it is a challenge to design the airdscape. Thus, the research question of this paper was: Can air in the landscape be designed, and if so, how? The aim of this paper was to identify diversity of air use as a material in landscape, architecture, interior design, arts and craft, beyond the boundaries of artistic disciplines and in habitual everyday use.

Scientifically space begins with vacuum or void. For this paper the air was understood as a phenomenological concept. The scope for this paper is of air in the material world. It is more a conceptual research due to multidisciplinary of the object of inquiry.

The theoretical framework for the theme of this paper has been developed over the years and the most notable authors are Bhatia and Mayer (2010), Böhme (2005), Lefebvre (1974), Nitschke (1993) and Robertson (1993). The research is part of an ongoing study of the atmospherescape as art material for the landscape architecture (Purs, Alle 2014).

No	Themes	Cases	Tools, mediums, principles, material qualities for design
1.	Humans		
1.1.	Humans body	to respire; to breath fresh air; a warm breathe into freezing air; to smoke; to blow soap-bubble; to blow dandelion fluff; to put the hands in the air; the wind in the hair; to jump; to feel air touching the skin;	to bring air into and out the body; to smell; to feel;
1.2.	Dance, sports and entertainment	ballet; circus acrobatics; skydiving; jumping (rubber); batut; gymnastics; shooting; archery; amusement park;	to overcome gravity; to fly, to jump, to move in the air;
1.3.	Throwing	ball; snowball; autumn foliage; splash the water;	to move object in the air; to play with gravity;
1.4.	Civilisation	wars; burning down; making clearance;	to clean space from old matter for new development;
2.	Natural phenomena		
2.1.	Precipitation and clouds	rain; snow; hail; fog; mist; clouds;	fills the air; encloses; brightness; mat; transparency; density; web; texture change;
2.2.	Light	the sun; the moon; stars; lightening; rainbow; light beams; aurora borealis;	lights up the air; colours the air; texture; vibrancy;
2.3.	Wind	windmill; windsocks; vertical wind tunnels; draught; ventilator; sail;	to create or use forces of air mass movement; invisible movement reflects in visible material;
3.	Aircrafts	plane; helicopter; drone; parachute; kite; air balloon; paper plane; balloon; sky lantern;	to fly/ to move object in the air; temperature change; to decorate the air;
4.	Industrialisation	fumes; smoke; dust; airplane vapour trail; also coloured; tires; aerial tramway;	to draw into the air; to create volume; visibility;
5.	Urban planning	air rights; aeration of city;	view; infinity to sky; to plan movement of air;
6.	Architecture of buildings and structures	balcony; roof terrace; skyscape; skylight; atrium; glass facades and internal walls; window; latticework; colonnade; gate; veranda; porch; loggia; vault; inflatable structures; Ferris wheel; tower, watchtower; observation deck or platform; tree house; bridge; pontoon;	to be into the fresh air; to go outside the walls of the buildings into the airscape; to be over the roofs; to bring air into the building; to merge the airscape; to overlook; to tower; to fill with the air; to elevate; across; to warm or cool the air;

TABLE 1. Use of Air

Materials and Methods

The data was captured by two methods. The first was the quantitative data selection of photos tagged ‘air’, ‘atmosphere’ and ‘void’ from social media networks Pinterest, Favim and ArchDaily. In the second method the cases were identified by brainstorming and cognitive inquiry which were accepted as appropriate to advance the research question. To identify and capture the data the main questions were: What humans do in and with air? What humans appreciate in the air? What is in the air? Where other disciplines use air? What materials has air into them?

Results

The identified air use cases were systemized in 16 themes (Table 1). The air use is by humans’ body, in dance, sports and entertainment, by throwing and civilisation. The air interplays with natural phenomena through precipitation, clouds, light

and wind. Aircrafts use airscape and industrialisation impacts air. Air is used in urban planning, in architecture of buildings and structures, in landscape, outdoors and their design elements. Air is found into rocks and felt within the space third dimension of relief. Wildlife fills the air. Gardens and plants interplay with air. Household uses air as a medium. There is air decoration and air use in textiles and clothes. We enjoy air in food and air is used also by fire. Airspace has a notable place in mythology and religion. The results summarises the anthropocentric perspective in use of air.

The groups are a set of concepts. There were notable cases that may interrelate with each other. The snowball effect was observed during identification of cases – one case led to several new. It was harder to identify the cases from everyday use, the cases that are not designed with intent to use or interplay with air, and the cases that have a long history of use. Also

		sunroom; cellar; cold pantry; greenhouse; sauna;	
7.	Landscape and outdoors, design elements	open space; ocean, sea and lake; plain landscape; roof landscape; parking lot; corridor landscape; street space; esplanade or promenade; avenue; crossroads; town square; waterways; courtyard; horizon; panorama; vista; sightline; skyline; silhouette; perspective; dynamic perspective ; enclosure; edge; margin; fence; hedge; glade; pergola; breezeway; hanging garden; hammock; swing;	to experience infinity; openness; closure; to aerate; to hang in the air; border; continuity of air space; depth; mosaic landscape; landscape diversity
8.	Rocks and relief	travertine; calc-tuf; cliff; mountain; cave; dune; pit; valley;	porosity; to tower; to feel height and depth;
9.	Wildlife	birds; insects; flying squirrel; monkey jumping; sponge; coral; honeycomb; airbladder; floral pollen; feather;	to fly; a porous texture; to fill the air; warmth;
10.	Gardens and plants	woody plants; deciduous trees; bamboos; bentgrass; reeds; <i>Gypsophila eleagns</i> ; vertical and hanging gardens; bridge gardens; climbing plants;	to create transparency, depth; fly in the air; to create airy textures;
11.	Household	bubble bath; airbed; sponge; aerosols; sprays; basket;	bubbles; air in liquid or solid materials;
12.	Decoration	Fireworks; flags; chandelier; puzurs (in Latvian) or himmeli (in Finnish); garland;	to gang in the air; colour the air; to fill the air;
13.	Textile and closes	Tulle; lace ; veil; volante ; porolone; dragnet ; gossamer ; fishing nets;	transparency ; lightness; airy; to catch;
14.	Food	whipped cream; sparkling wine and drinks; cotton candy; sponge cake; yeast; fermentation; whisking;	to get air into; foam; to feel air bubbles on tongue;
15.	Fire	bonfire;	to change the air;
16.	Mythology and religion	heaven; gods in sky; Icarus;	to dream; to believe in infinity.

TABLE 1. Use of Air (Part 2)

subjectivity is risk for the completed results. It was notable that compared to brainstorming and cognitive inquiry within various disciplines and everyday life, the photos in the social media networks were visually strong images and artistically inspiring (Figures 1, 2 and 3).

The results were analysed and characterised to enhance and generalise tools, means, design principles, material and artistic qualities of air as material for landscape design. The value of research results is within their diversity and by excessive generalisation there is a risk to lose the essence of the findings.

Discussion and Conclusions

The results of the study prove that air can be the design material and the airscape can be designed. By the case study it was notable that both in arts and in everyday use air is used as a material, but there is need to actualise it. The understanding

matures on necessity and possibility to highlight the air from background, from nothing to an equal material for design of holistic landscape and provocation appears to bring out the air from background to the soloist material.

However the results were surprisingly diverse it feels there is still space for creativity and imagination to explore airscape design by use of contemporary technologies and by borrowing knowledge from other disciplines. The transdisciplinary cases refresh existing and bring new knowledge to the landscape architecture discipline. The research raises potential to consider conscious use of air in design, the coherence of the air and the matter in the design. Air is invisible, but expresses itself within interaction with other materials in physical, artistic and emotional character. The invisible movement of the air is reflected in visible materials. The void itself has a potential to be infinitely large in scale in the form of the Universe and



FIGURE 1. Fill with balloons. (Forsythe, 2002)



FIGURE 2. Wind and architecture. Aerodium. Latvia Pavilion for Shanghai World Expo 2010 by Mailitis A.I.I.M. (Jordana, 2010)

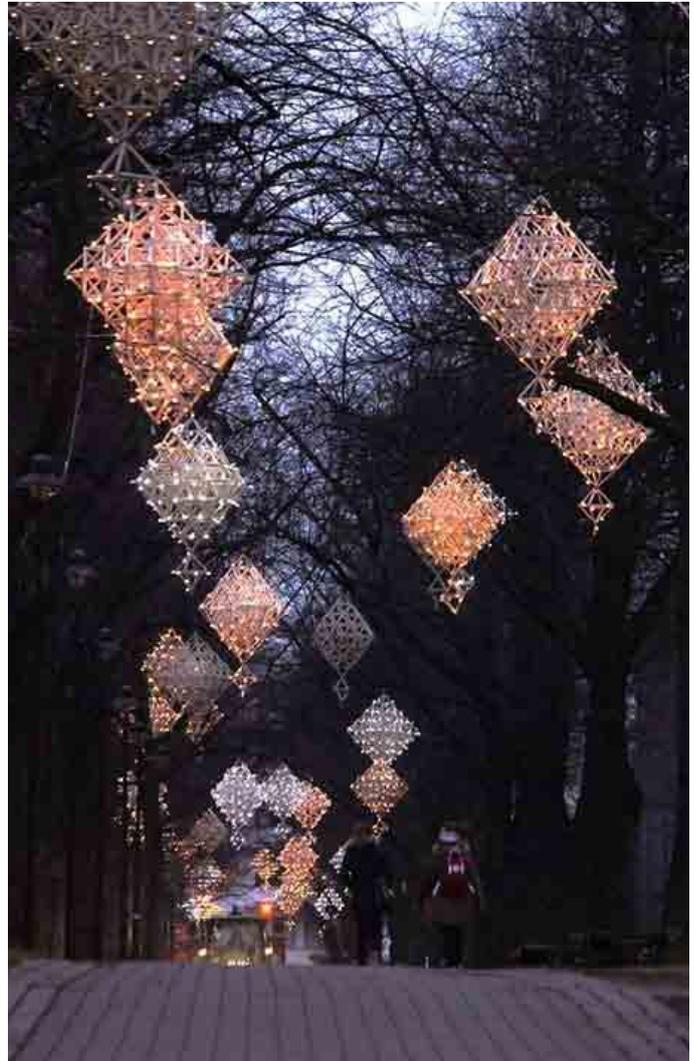


FIGURE 3. Finnish Christmas ornament Himmeli. (Merikaupunki Kotka, 2014)

availability to get into invisibly small space. Air is all around – it is not possible to remove the air, it is possible only to fill the air. It varies how to fill the air with solid matter, the degree of transparency, varieties of textures and density of matter, sharp or blurred transitions and degree of contrast. There are various ways how to experience the air.

The concept of nature is developing. Air is a part of nature. This brings up an issue on how to bring nature in urbanism from low to high density. There is plenty of air in the urban area hence plenty of nature. Air is a mysterious and powerful material.

References

- Bhatia, N. & Mayer, J. H. eds., 2010. *Arium: Weather and Architecture*. Ostfildern: Hatje Cantz Verlag.
- Böhme, G., 2005. Atmosphere as the subject matter of architecture. In: *Natural History*. Herzog and de Meuron: Lars Muller Publishers.
- Forsythe, W. 2002. Scattered crowd. <http://madhatterart.co.uk/market/scattered-crowd-whites-forsythe/> Retrieved: 2016.06.06.
- Jordana, S., 2010. Latvia Pavilion for Shanghai World Expo 2010 by Mailitis A.I.I.M. <http://www.archdaily.com/48851/latvia-pavilion-for-shanghai-world-expo-2010>. Retrieved: 2016.06.06.
- Lefebvre, H., 1991 [1974]. *The Production of Space*, trans. Nicholson-Smith D., Oxford: Basil Blackwell.
- Merikaupunki Kotka, 2014. Himmeli. <https://www.pinterest.com/pin/396035360965722303/> Retrieved: 2016.06.06.
- Nitschke, G., 1993. MA – Place, Space, Void. In: *From Shinto to Ando – Studies in Architectural Anthropology in Japan*. London: Academy Editions, 1993, 48-61.
- Purs, I., Alle, E., 2014. Natural Elements and Phenomena of the Atmosphere as a Material for Public Art. In: *Landscape Architecture and Art*. Latvia University of Agriculture. Jelgava, Latvia. 2014. 32-48. ISSN 2255-8640. http://lufb.ltu.lv/Raksti/Landscape_Architecture_Art/index.html
- Robertson, K., 1993. On White space: When less is more. *Émigré*, Vol.26, Berkeley: Emigre Inc.
- Sauer, C.O. 1996 [1925]. *The Morphology of Landscape*, in *Human Geography: An Essential Anthology*, edited by J. Agnew, D.N. Livingstone and A. Rogers. Oxford: Blackwell, 296–315.

Integrating Cross-Discipline Collaboration into Landscape Architectural Curricula

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landscape architecture pedagogy | design studios structure |
developing student engagement in design studios

Can landscape architectural design studio pedagogy be (re) structured to maximize learning potentials, include aspects of professional practice and challenge students to increase the development of their individual work process?

A proposed method is to implement a studio format where a defining theme for the course is outlined rather than pre-selecting a specific site for students as a semester project. Students are provided site selection and project criteria and, within guidelines of the semester theme, can propose a site and primary focus for their semester project.

Students must present a proposal to instructors for approval of their site, research topics and issues which they propose to address within their semester project. With assistance from instructors, students are required to outline goals of their study and create a set of questions from which to develop research topics, analysis criteria and design studies.

By mentoring students through this progression they are challenged to better develop their design approach, research practices and problem solving skills. The application of these teaching and learning structures creates a format for the academic design studio which promotes greater student learning opportunities, improved student-instructor dialogue and incorporates elements of professional practice.

Goals of the Course

Utilizing the 'semester theme' approach strives to create the opportunity for a unique journey of exploration for each student while under the guidance of instructors. This format is implemented to allow greater flexibility for students to select topics of particular interest.

The goals of the course include:

- challenge students to examine, understand and develop their individual work process
- motivate students by allowing flexibility to select specific areas of study within a given theme
- empower students to assume more responsibility for their work while being accountable for productivity and project decisions
- introduce students to envisioning the life-cycle of a project and develop schedules and proposed deliverables
- expand students ability to analyse design problems and develop conceptual designs in response to criteria developed through diagramming and analysis

Methodologies

Syllabus

How can we provide enough structure so the class is clear, yet allow students sufficient latitude to develop and explore their own learning styles, design approach and critical thinking skills? A well-constructed syllabus is critical to communicate learning experiences and processes that are designed into the course and evaluation methods that will be utilized.

This can be the primary vehicle for the design instructor to create a legible framework for the course and establish tangible goals and expectations for students. The ability to establish these at the onset of the course is critical for students to have

a learning curve and work trajectory that is aligned with the expected outcomes of the course. Failure to establish these goals early on can alienate students and diminish learning potential.

Course Structure and Defining a Semester Theme

For LARC 5110 Advanced Design and Urban Environments, we introduced the theme of 'Urban Succession: Evolution of the City' which emphasized design within the continuum of time, examined the factors that influence urban morphology, and related the development of cities to the stages of natural succession: nucleation-invasion-colonization-aggregation-competition-stabilization.

The course structure combines reading, case studies, site visits and design exercises, all of which support the semester theme. The course began with a review of several cities worldwide, both historic and modern, examining the history, urban form and various factors that shaped them. Students were given an exercise to select a city and perform analysis of the forces that defined their current form and presented findings to the class for review and discussion. These studies were supported with readings about history of urban form and selected case studies which highlighted these processes.

Criteria for Site Selection and Semester Projekt Parameters

For students' semester projects, criteria for site selection stated that the proposed project area must be within the greater Boston area, such that the student could visit, document and research the site. The site or area of study could be any scale and is not constrained by legal boundaries or political designations but must have a defined boundary for the purposes of the semester project.

Students were required to develop a proposal for review by studio instructors which included their proposed site, outline of research topics and methodologies, and primary focus and goals of their study. Once approved students began their project by visiting their sites, mapping the various relevant layers of data and developing diagrams to illustrate key findings including programmatic relationships, functionality and infrastructural elements.

Students were required to research and diagram history of the site, infrastructure, economic factors, demographics, relation to context, past and current functionality, urban morphology and any other factors relevant to their specific site. These were presented in a studio review format where all students were able to review and comment.

To incorporate elements of professional practice students were required to develop a work plan based on their selected site and submit a list of materials to be submitted. This challenged students to consider time constraints, strategies for managing their work and develop a list of deliverables required for key studio reviews.

Assignments and Managing Variability

Students were assigned a series of exercises leading them through stages of succession and how these relate to urban

morphology, studies of disturbance and reconstruction in urban environments, and research on case studies and global cities. These exercises allowed students to select sites or cities for their assignment, perform research and identify key issues.

This format allowed for some variability in responses which needed input from instructors to guide the work. The instructors needed to maintain a close review of student progress throughout the semester to assure work progress was on track with semester schedule and goals as outlined in the syllabus and student project proposals.

Results, Conclusions and Reflections

In general the studio was successful in that the students were excited about the proposed format and quickly found specific areas of interest within the semester theme. They responded well to the exercises which led up to the semester project and identified a very diverse and complex range of sites and topics as individual semester projects. With review and approval from instructors the students performed research, diagramming and analysis which were also predominantly understood and executed. Once into the semester projects, some students grappled with which specific topics to study in greater detail and required input from instructors.

The greatest challenge came when students were required to develop a series of conceptual designs to test various potential solutions in response to criteria, programme and issues identified in the analysis and problem statement phase. Many students chose only to draw digitally which, in our opinion, severely restricted their ability to generate ideas and concepts. The goal was for students to develop multiple conceptual alternatives for evaluation, reflection and revision into subsequent solutions aimed at addressing and prioritizing the principles established for their project.

This is where we observed the greatest vulnerability of this studio format, students struggled to apply results of analysis to site programs and conceptual forms. Most needed significant input from instructors to attain a clear direction and make discernible progress which could be adequately reviewed by instructors and then further developed by students.

The studio advocated that the urban design process should not be structured to yield a singular solution but rather that through a series of questions a multitude of possible solutions are proposed and examined for a given problem. However, many students failed to make progress while searching for a singular 'best' solution and others were hindered by the myriad of design choices despite the highly developed criteria which had been established earlier.

We attributed much of this to all their previous design studios where a specific site had been given with pre-defined criteria and list of required drawings which eliminated the critical bridge between the diagramming-analysis phase and the generation of design responses and conceptual solutions. This was a major goal of the semester and we found almost all students needed significant direction to bridge this gap.



FIGURE 1. Student work sample LARC 5110 M. McNally: Concept

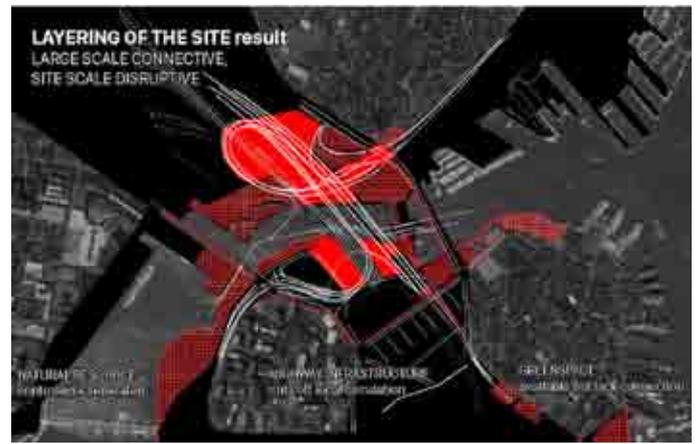


FIGURE 2. Student work sample LARC 5110 M. McNally: Analysis

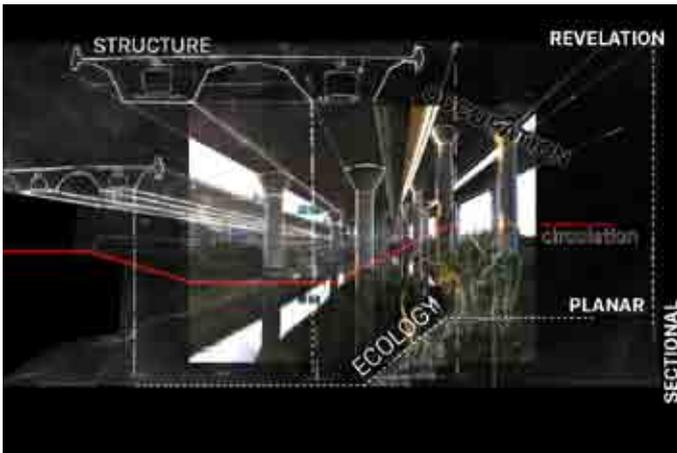


FIGURE 3. Student work sample LARC 5110 M. McNally: Sectional concept

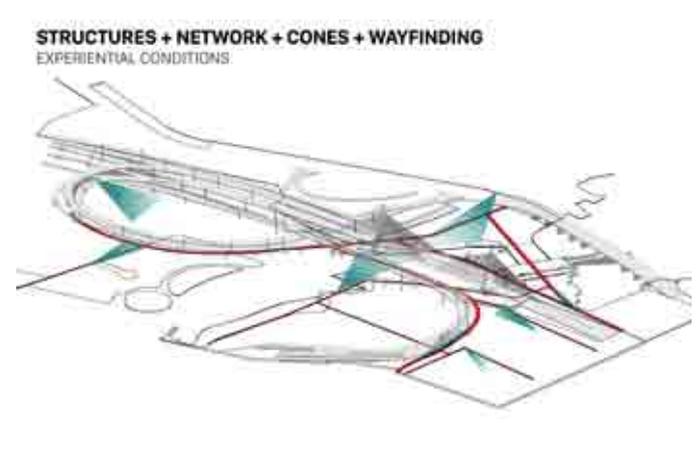


FIGURE 4. Student work sample LARC 5110 M. McNally: Axon study

Utilizing a semester theme approach can provide greater opportunity for students to develop their own unique work approach, understanding of their process and ability to focus on topics of specific interest. The risk with this approach is students may select topics of study which may prove challenging once they get into the conceptual design phase. Herein lies both the challenge and opportunity of this proposed studio structure. However, the potential for students to explore a broader range of issues and make individual discoveries is greatly increased as compared to studios with assigned sites and much of the criteria pre-defined. These studio structures can significantly improve student engagement, learning opportunities and the higher development of critical problem solving and time management skills.

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Educating City Landscape Designing in University of Life Sciences in Warsaw

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city landscape design | urban planning | analysis of space values

City landscape designing takes place on many levels concerning various types of environment. A city is a peculiar field for those kind of activities. It requires a bit of a different approach than designing in open natural space. Most of all it's a matter of its components. The factors influencing city landscape are complex. Along with the aspect of nature there is a whole range of issues connected to infrastructure and functionality of urban structure. A more interdisciplinary attitude towards city landscape is needed, which should be reflected in the education process. As for the University of Life Sciences, the Landscape Architecture faculty has launched a subject "City Landscape Designing" based on methods combining the principles of landscape and urban design. Issue one is teaching how to effectively work in groups. Solution – workshops with professionals dealing with urban planning and landscape architecture in all specializations. Issue two – spotting the simple way of the first step in designing spaces. Solution – finding and applying the net of composition supported by a free stream of consciousness. The main purpose is to teach how to create city landscape in macro and micro scale in respect to human needs.

Introduction

A City is one of the most important structures in societal life. Their complexity and variety determines cities as a rich research field for all disciplines of science. Knowledge linked with its design, aspects both – formal and functional require a multidiscipline approach. On the one side according with all urban needs, on the other coherently with social necessities. City landscape designing is the faculty which tries to close a specification of space creation in an understandable way for landscape architects. One purpose of exercises is to teach how to read, diagnose and finally how to change city in the most probable way - functional, and acceptable for people in the terms of beauty. That's why the workshop linked with landscape architecture is broadened by knowledge about urban planning, architecture and social sciences as Heidegger's "to build" was related with the best quality of "to be".

Issues in assuming "City Landscape Design" need some basic knowledge about rules of design and that's why it is organized in the second stage of the studies. Students attending faculty should have some command of landscape design methods. The range of workshop to start stakeholding in faculty student owes on first stage studies with learning about parks and garden design and with space planning faculties. The point is they have already picked up horticulture and garden designing as well as principles of local planning.

The course of "City Landscape Design" is held in the second stage of bachelor degree studies, in daily and mural mode with the Faculty of Horticulture, Biotechnology and Landscape Architecture, University of Life Sciences in Warsaw. The subject consists of two semesters broken into 60 hours of exercises, 30 hours of lectures in daily mode and 21 hours of lectures and 35 hours of exercises in mural mode.

Issue

The main issue is to teach about all city processes, about its interpretation in a particular part of city. Teaching how landscape architects should observe city spaces and diagnose the best changes. It is essential to connect methods in landscape design and urban planning in the coherent way for landscape architect.

Methods and Solutions

Teaching design is a multidisciplinary process and one has to make students realize it. It is crucial to make them understand what city and its space are and how to read them in a wider space context. The context itself is essential and by no means should be disregarded.

There are 3 phases when it comes to practical teaching. The first one – analysis – which shows what is located in each space and how it should be interpreted in the social and spatial meaning. The second phase is its synthesis and its result as a design guideline of analysed place. The last one is designing particular fields and elements.

The aim of the first stage of analysis is reading and recognizing space in visual and social aspects. In that domain they work out what's existing and the identity of particular space elements and interpret them preliminarily. While analysing, the Panofski model is used but developed in more particular elaboration according to the character of place being designed. This method of research and diagnosis of the field lead to three observations:

1. "A first sight" – showing a realistic image, technical layer of spatial pattern, what is in the analysed place and where it is.
2. "A second sight" – is a spatial sense of spatial pattern, how are the parts of space (e.g. wall is limited space, facade is embodiment of owner).
3. "Reflection" is a structure of symbols, values of the space. It helps to find out the answer of why an existing place is like it is.

In a practical way the Panofski model is used as below. First, an inventory of all elements and functions of the field, such as existing buildings and infrastructure. The next step is analysis of field composition. This analysis is according to identity of urban composition elements by Wejchert and Lynch, where landmarks, characteristic points, Openings, composition axes and urban interior systems are recognized. With fields of research similar or places, the Skalski method is used, which is based on recognized characteristic elements and on view areas of elaboration. This method is similar to the Cullens method of view sequences which is used to recognize line spaces, like streets e.g. when the field of research is bigger, view analysis in a wider context is used – panorama analysis, and research of space pattern according to Dominiczak and Salingaros method. During this research proportion patterns are read in architectural, urban and nature meaning.

The next step is to analyse space values i.e:

- Preservation values refer to genuine structure from the past, often objects or space written to government evidence.
- Sacral values concern both- 'sacrum and profanum', sign uniqueness and individuality of place. They may have religic dimension, but they may not either, they may have magic in it.
- Figurative values are linked with sacra values, they are dedicated to particular events, places, buildings, and people. They define identity of places, cities, countries, nations.
- Psychological (sensual) values influence on human perception of city space. Form, function and meaning of city spaces, the particular ways it impact on humans – attracts or repels.
- Social values determinate prospective interactions among people, they are connected with a manifest of sharing the same values, preferences, attitudes, feelings, and they could be expressed deliberately or spontaneously. They could be attractive/discouraging public/semi-public (institutional), semiprivate/private.
- Historical values are records of activities which were in the past and the present, they concern the past. They are part of preservation values.
- Aesthetic values are objective, when it comes to e.g. Classic canon of beauty, or they are subjective when we have a point of view that beauty is something that is liked. Aesthetic in relation – form could articulate kindness, neutrality or contempt for human.
- Artistic values are deliberately implemented by their author. They are defined by style, combination of styles, they concern both form and structure object and events. They are work of art, architecture, sculpture, architectural details.
- Landscape values a number of environmental and anthropogenic elements constructing a view.
- Natural values are the amount of natural elements, they concern both living and unliving elements. Trees/lawns/ natural structures.
- Local/national/universal values depend on climates. Access to technologies and some other factors like, ideas, institutions, morality, and character. It depends on the scope which could embrace a local community, a nation or the whole world.
- Practical values depend on adjustment of each space to physical and mental needs of users.

PANOFSKI MODEL	PARTICULAR WORK OF STUDENTS
“At first sight”	INVENTORY ANALYSES: - ANALYSIS OF TRAFFIC; - ANALYSIS OF BUILDINGS AND AREAS FUNCTIONS FIELD OF RESEARCH.
“At second sight”	- ANALYSIS OF COMPOSITION; - ANALYSIS OF VALUES; - ANALYSIS OF PERCEPTION(OPTIONAL); - ANALYSIS OF VIEW SEQUENCES; - ANALYSIS OF PANORAMS (OPTIONAL); - ANALYSIS OF <i>GENIUS LOCI</i> ELEMENTS.
“Reflection”	DIAGNOSIS FOR FIELD OF RESEARCH

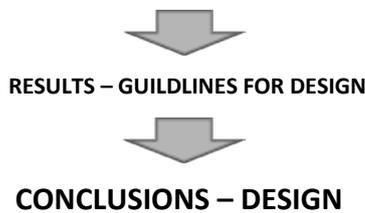


TABLE 1. Structure of City *landscape designing* education.

The next part of work is phenomenological genius loci analysed by Norberg –Schultz method. The score defines material and non-material elements. Particular parts are dedicated categories of things, time, order, character and light. The field of research is to record one of three kinds of composition – classical, cosmic or romantic. Research shows feelings of place perception. After finishing analysis students define guidelines for the field of research which are a collection of stories from each analysis. Then they start to design space. The process of design is the result of analysis synthesis, diagnostics of field shown in design guidelines. The design is divided into few steps. The first one is to define a programme of changes. The next step is finding and applying the net of composition supported by a free stream of consciousness. The third one is the general concept of the changes. The last step is technical elaboration of concept. All works are prepared on plans, with photos and with using 3D models made by computer techniques or handmade sculpture from various materials ranging from paper to wood. What is very important with designing are elements determined by proportions and the author’s image of place. It should be as kind as it could be, When it should be changed – only in the way to be a real reflection of needs – social, technical, aesthetic and functional meaning (Table 1).

Summary

‘City Landscape Design’ gives knowledge essential to understand and diagnose city space. This faculty connects both kinds of design – landscape and urban planning so it has a very multidisciplinary character. The key is to teach work in small groups, which is not always easy for students. After finishing the class of ‘City Landscape Design’ the student knows how to recognize and interpret space, they are able to describe and diagnose space in cities. To summarise, the student is supposed to be able to create and design both a beautiful and functional place.

Social Landscape Architecture as the Missing Link in the Shaping of Urban Public Spaces

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public space | socio-gardening | hortitherapy | edible landscaping | genius loci

The potential for completing the participative assumptions of landscape architecture and the mechanisms for its social action were illustrated on the basis of development concepts for the Commons at the Lublin Castle.

The paper presents the assumptions of elements of social landscape architecture (socio-gardening, hortitherapy and edible landscaping) that take the genius loci into account, creating a new type of public space that is integrated in a multidimensional way, making the city's inhabitants feel that they are the real owners of the place. This approach in design seems to be the missing link in the shaping of urban public spaces. Socio-gardening researches the dependencies between gardening and human beings, both in an individual and a social context, in order to find ways of bettering its life. Hortitherapy connects elements of medicine, psychology, rehabilitation, and special needs pedagogy, using work in the garden to improve mental and physical health.

The socio-gardening, hortitherapy and edible landscaping assumptions adopted in the project indeed fit the context of the place perfectly without compromising the historical conditions, while creating a new quality of space that forms a kind of folksy garden accessible to the local community and close to its heart.

Introduction

The modern post-industrial city is frequently characterised by a public space dominated by commercialism, the culture of 'superfluity', and lack of familiarity. Neighbourhood bonds and communities constitute a social phenomenon that is vanishing in contemporary cities (CBOS 2012). 'Public spaces shrink fast and vanish and the community created by city dwellers vanishes, replaced by divisions and segregation' (Baumann 2007:31). Jan Gehl distinguishes between four types of cities with different levels of development: the traditional city, the 'appropriated' city (where public space has been subordinated to the needs of automotive transport), the deserted (depopulated) city, and the regained city (reanimated; one where there is a real balance between the functions of trade, meetings and communication) (Pluta, after Gehl, Gemzøe 2001: 14). The organisational principle of space has a huge effect on the creation of contacts between its inhabitants; creation of space engages inhabitants, supporting the construction of a common identity and bonds with the space. The turn towards locality seems to be a necessity in contemporary cities, now as never before; as Elżbieta Przesmycka observes, '*there is the common need for creation of spaces that will adopt new functions, at the same time preserving memories and identity of place*' (Przesmycka 2008: 79).

The aim of this paper is to present the architectonic response to the search for a new image of the city through the construction of social ties. Participative landscape architecture seems to be the antidote, as it means not only participation in decision-making and the creation of design concepts, but also drawing the local community into the continuous process of the functioning of space initiated by the therapeutic and integrative action of specific spatial solutions. Elements of social landscape architecture (including hortitherapy and edible landscaping) seem to be the missing link in the shaping of urban public spaces, creating a new quality of urban design.

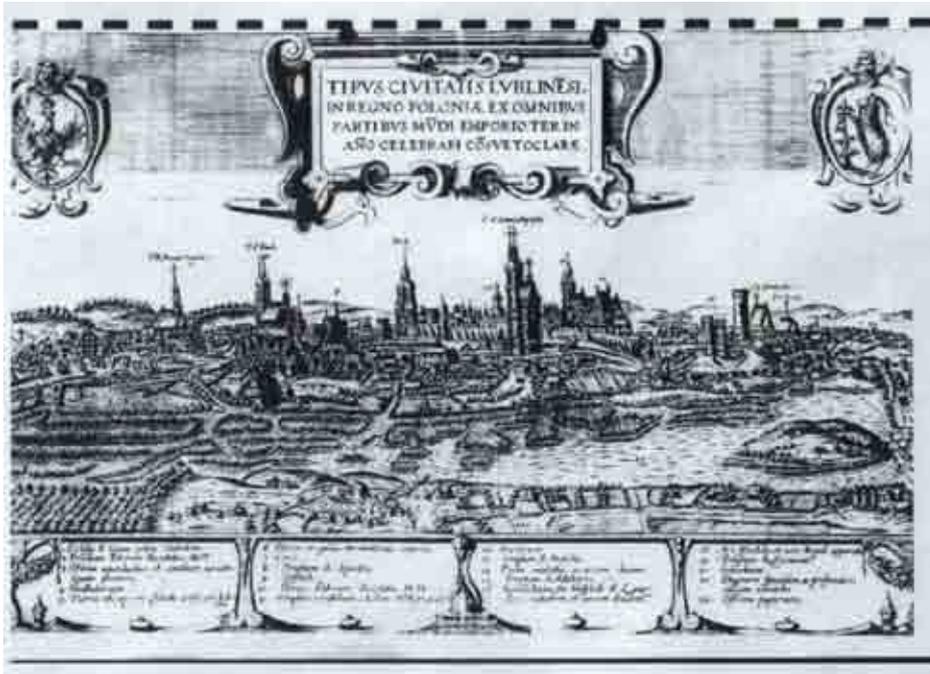


FIGURE 1. Panoramic view of Lublin, Georg Braun 1618. (Source: Zalecenia Konserwatorskie)

The potential for completing the participative assumptions of landscape architecture and the mechanisms for its social action are illustrated on the basis of development concepts for the Commons at the Lublin Castle.

Lublin - Lost Identity

The history of the development of settlement in the area under discussion is connected with the location of the Royal Pond (Polish: *Wielki Staw Królewski*) in the Bystrzyca river valley in the 14th century, when the village of Tatarzy was located on the pond's east bank. On the basis of archive maps and panoramic views, we can confirm that up until the 16th century no settlements were present in the river valley below the Old Town (Figure. 1). In a later period, up to the early 19th century, the residential buildings – mansions and homes – were concentrated exclusively along the road around the hill and in rear sections of the parcels (utility buildings). The areas located in the lowest part of the valley near the pond, were not built up, as the area was being used as orchards or meadows. From the late 19th century onwards, with the development of industry in Lublin, the Bystrzyca river valley was gradually built up, and the existing historic buildings were gradually replaced with newer, larger ones. This development process, which has continued to the present day, is leading to the dissolution of the unique features of the landscape and the specific genius loci of this terrain.

Based on the analysis of historic materials, it was established that the area covered by the project was on the border of agricultural land (gardens, meadows) that belonged to the city and the area of the great Royal Pond established in the 14th century. Not until the 19th century was the area gradually built up (including, among others, the disharmonious marketplace of the 1990s) (*Zalecenia konserwatorskie*). Since the spatial

order of the Old Town and midtown Lublin can be treated as an artistic composition, the history of this complex can be recognised as possessing significant nonmaterial value.

The Concept of a Park in the Commons at the Lublin Castle as an Attempt to Recover the Identity of the Place Idea

The idea of developing the Commons at the Lublin Castle is based on the connection of utility and educational gardens, forming foundations for the integration of the local community, as broadly understood. The basis for the adopted idea was the genius loci, connected with the centuries-long agricultural tradition of the Lublin region.

For years now, the world has been successfully using knowledge of socio-gardening and hortitherapy to shape public space. Edible plants are being introduced to civic areas due to their decorative qualities, heretofore undervalued, which are part of the new trend visible in landscape architecture: edible landscaping. Socio-gardening investigates the relationship between gardening and the individual, in the context of both the individual and of the community, in order to find opportunities for improvements in the quality of life. Hortitherapy is a form of occupational therapy connecting elements of medicine, rehabilitation psychology, and special needs pedagogy, utilising garden work to improve the mental and physical condition of those it serves. The effects of introducing such solutions depend on the situational context and the users of the space, and can concern both individuals (increasing their activity and creativity, or improving their moods) and whole communities (through initiating and enhancing bonds with space, promoting social integration, and preventing the effects of exclusion).



FIGURE 2. Development project of park in the Commons at the Lublin Castle. (Czalczyńska-Podolska M., Rzeszotarska-Palka M., Szymiski A., Nowak P., Mincel M., Brygert H., The concept of park in the Commons at the Lublin Castle, September 2015).



FIGURE 3. Development project of park in the Commons at the Lublin Castle. (Czalczyńska-Podolska M., Rzeszotarska-Palka M., Szymiski A., Nowak P., Mincel M., Brygert H., The concept of park in the Commons at the Lublin Castle, September 2015).

The assumptions of socio-gardening, hortitherapy and edible landscaping adopted in the project indeed fit the context of the place perfectly, without infringing on the relevant historical conditions, creating a new quality within the space of a modern common area, as well as in the form of a kind of folksy garden accessible to everyone and close to the hearts of the citizens of Lublin. As a result of the adopted formal and functional solutions, which include ensuring the opportunity for active gardening, a space – integrated with multiple dimensions is created in which the residents of Lublin may feel themselves to be real farmers.

Composition

The basis of the composition for the establishment is divided into six themed zones, which uses a connecting element present as a compositional axis in the form of a pergola, which is

coloured to contrast with the greenery. The subsequent zones, starting from the castle hill, change functions and forms while retaining the consistent atmosphere of utility-recreational gardens. The composition of the D zone (utility gardens) serves as a sort of apex of the composition, whereby the main idea of the project is concentrated and emphasised by its central layout (that of a so-called ‘pizza garden’) (Figure 2).

Programme

The thematic zones created in the Commons of the Lublin Castle, use elements such as sensorics and hortitherapy, with the aim to complete the educational and integrational tasks. Each zone was designed so as to allow everyone, independent of age and ability, free use of the area and a choice of various forms of passive and active recreation. Special roles are played by the flower meadow, as an element referring to the past form

of the castle hill development; by the utility gardens as the culmination zone, including the vegetable garden in the form of a 'pizza garden'; by an orchard with a composition resembling historic patterns; and by a labyrinth based on the idea of edible landscaping (Figure 3).

Summary

The adoption of these solutions was dictated by the discovery, with reference to local tradition, of a chance to 'regain' the identity of the place and construct social bonds. The agricultural traditions forming the genius loci of this terrain were manifested in connection with current tendencies in landscaping. Elements of social landscape architecture appear to be the key to the creation of a new quality for contemporary public spaces, making them familiar and friendly to people, and so bridging a gap in urban design and landscape architecture.

References

- Baumann Z. Globalizacja, Państwowy Instytut Wydawniczy, Warszawa 2007.
- CBOS, Komunikat z badań "Kontakty z sąsiadami i inne więzi społeczne", 2012, http://www.cbos.pl/SPISKOM.POL/2012/K_093_12.PDF.
- Czalczyńska-Podolska M., Rzeszotarska-Palka M., Szymski A., Nowak P., Mincel M., Brygert H., The concept of park in the Commons at the Lublin Castle (Koncepcja parku na Błoniach pod lubelskim Zamkiem) September 2015.
- Pluta K., Przestrzeń publiczna miast europejskich after: Gehl J., Gemzøe L., New City Spaces. The Danish Architectural Press, Copenhagen 2001, p. 14.
- Przesmycka E., Serce miasta, Czasopismo Techniczne, z 4A/2008, Wydawnictwo Politechniki Krakowskiej, Kraków 2008, p. 77-87.
- Zalecenia konserwatorskie, Biuro Miejskiego Konserwatora Zabytków w Lublinie, January-February 2014.

Transforming the Urban Fabric – The Case Study of Freiburg

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resilience | fabric | informal planning | transformation | green infrastructure

What do resilient fabrics of future cities look like? What is the role of open spaces and streets? Are there new roles for landscape architects in new design processes? The German city of Freiburg is an enlightening case study providing answers to these questions. It represents a group of municipalities that dare to challenge the existing structure of the built city. In Freiburg the project “Perspektivplan” was a radical change of direction: After years of focusing on developing new neighbourhoods like world-famous Vauban, the city began to rethink the structures of its urban landscape as a whole. Designers found for example strategies to work with intermediate spaces, such as large transport axes, which currently create barriers prohibiting people to roam the city freely. These elements had been taken for granted during the last decades, but in line with Freiburg’s mobility transition, their privileges can now be questioned. Landscape architects played a major role, contributing their understanding of dynamic growth and movement, and their ability to grasp the constantly changing cityscape as an open and inspiring totality.

Some municipalities dare to challenge the existing fabric of the built city and start to redesign it as a whole, emphasising the importance of green infrastructure (Austin 2014). What do resilient cities look like? What is the role of open spaces, parks and streets? Are there new roles for landscape architects in such design processes?

The German city of Freiburg is an enlightening case study for these questions. Freiburg’s “Perspektivplan” project was nothing less than a radical change of direction: After years of focusing on developing new neighbourhoods like the world-famous Vauban, it began to rethink the structures of urban landscape as a whole, including inner city areas, neighbourhoods and villages, infrastructure and forests. The project aimed to identify hotspots for transformation and to find a spatial vision and spatial strategies to inspire a restructuring of the city. Freiburg faces particular pressures; with around 1,000 new jobs (net) created each year since 2009 that attract people from all over the world, the housing market is extremely tight.

The role of the landscape architects in this project was twofold. First they were able to grasp spatial elements such as riverscapes, forests, neighbourhoods and streets as landscapes that can be expressed both as open images, and as a consistent ensemble. Second, landscape architects are trained to work with dynamic structures such as processes of growth and decline transformation resulting from repetitive cultivation or changing patterns of usage. Because the sustainable transformation of urban landscapes relies on design processes that carefully identify the particularities of sites (Diedrich 2013), the design team in Freiburg explored the city and engaged with its atmosphere. They observed the urban fabric and its interconnections, identifying particularities. The landscape architects on the team focused in particular on the dynamic

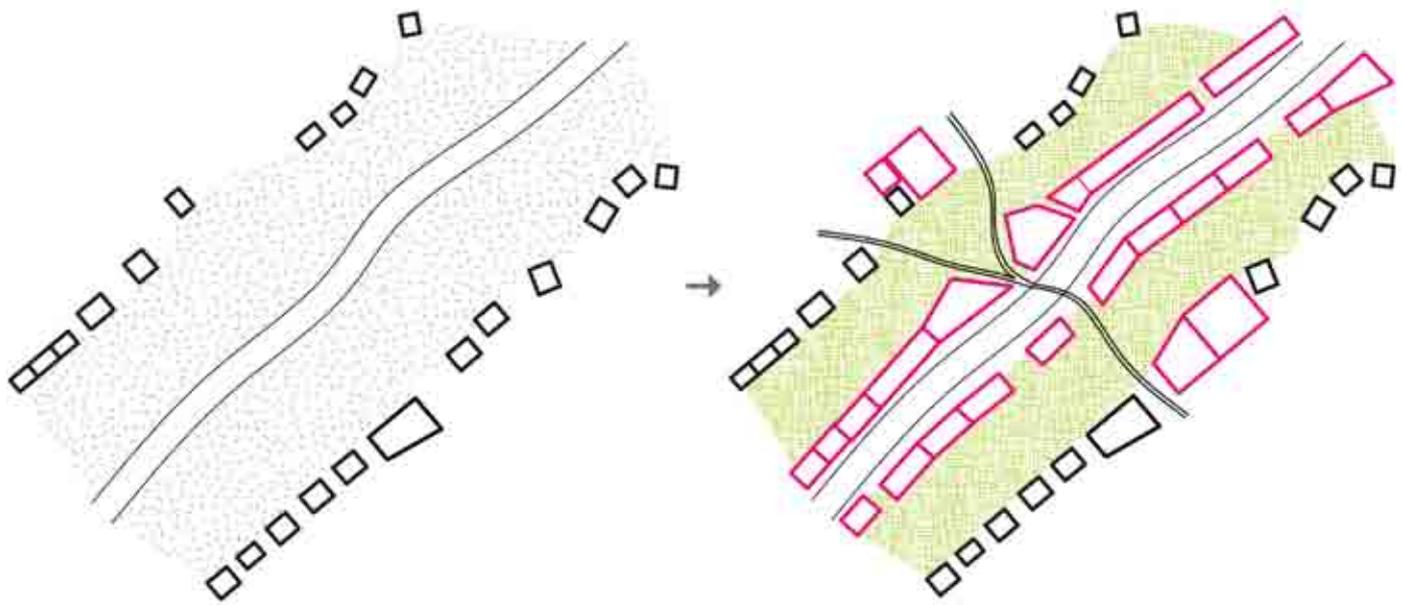


FIGURE 1. Strategy Capture, Perspektivplan Freiburg © cityförster, freiwurf, Stein+Schultz

aspects of places, such as moving people, tides, growth and dynamic floodplains, searching for drivers of transformation to be used as a starting point for designs. This exploration of Freiburg was crucial to the Perspektivplan project because strategic designs for the cityscape were to express, reflect and develop distinctive dynamic elements of the city. These elements were not portrayed in books and could not be defined by quantitative data. They had to be appreciated by sensing ephemeral, dynamic properties.

With these dynamic processes in mind, a static masterplan was out of the question. The new framework to guide Freiburg's planners had to be rough and resilient, providing orientation and room for unexpected opportunities. It focused particularly on intermediate spaces, such as large streets that form barriers that prohibit people from freely roaming the city. Over the last decades, these dominant elements of the city's fabric had been taken for granted. But, in line with the city's mobility transition, the design team now questions their privileges.

Their "Capture" strategy proposed ways of transforming the streets into usable open spaces. Building soundproofed houses with backyards protected from noise allows unused roadside to be utilised so that formally hierarchical transport axes become part of the city's fabric, playing diverse roles and no longer acting as barriers.

The new framework can be divided in three fields. The first, "riverscapes", addresses areas along the three major floodplains. Each new project in these areas must define its relation to the river. Riversides will be transformed from small, and in some places inaccessible strips of green, to a river park. The second field, "cross connections" follows today's linear gaps that will be transformed into dense, multi-layered hotspots of urban life. The streets themselves will be important elements of public

space. The third field is called "urban glades". These glades are parks and other green spaces, including an airfield, which will be kept open to provide expansive views of the cityscape and places to linger and breathe. The urban glades provide links between the cross connections, that in turn connect up the riverscapes. Combined, the three create a green infrastructure unique to Freiburg.

Thus, the case study of Freiburg leads to the following conclusions:

First, in times of dynamic changes orientation is key. In terms of the look of a city, orientation means that the interconnections between elements are clear and walkers and cyclists do not feel lost. In terms of the spatial vision, orientation means showing the relationships between parts of the city and its whole. Second, it is crucial to develop new housing areas and new open spaces in one go. Each new building project must be associated with a new park, a newly designed riverscape, an improved public square, or a new sports ground. This might seem impossible in an increasingly dense urban landscape. But the restructuring of a city generates new spaces: Former parking lots, for instance, can become parks if new houses incorporate the carports. Neglected roadside greenery can be transformed into open green space if new buildings along the major transport axes are soundproofed.

In Freiburg, the evolving fabric is less static and offers a framework to inspire projects that benefit the whole urban landscape. The process of elaborating designs inevitably involves collaboration between different professions, groups of stakeholders, and the public (Stein, Schultz 2015). Resilient structures cannot be defined and presented in a single masterplan developed by a small group of planners. Rather, they are a rough framework, elaborated by different groups

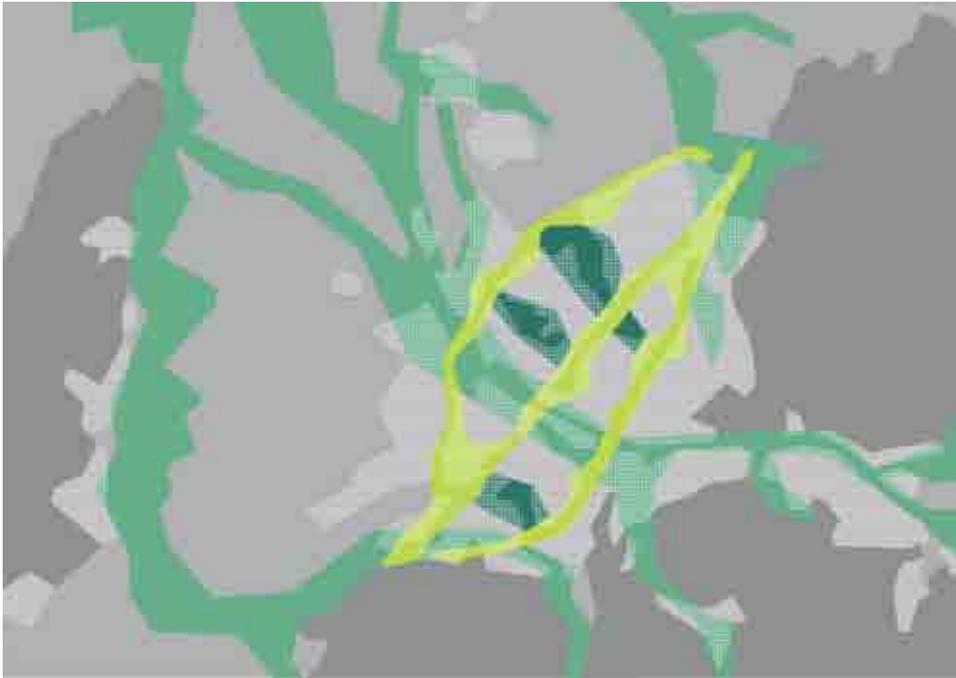


FIGURE 2. Spatial Vision, Perspektivplan Freiburg © cityförster, freiwurf, Stein+Schultz

of stakeholders to provide orientation and space for dynamic processes to unfold. This framework has to cope with unpredictable and unplanned elements, such as temporary housing for refugees (Saunders 2010), individual appropriation of initiatives, and the changing role of streets in times of digital mobility.

As a radical change in direction, the Perspektivplan's approach initially met resistance from the city administration's urban planners who saw Freiburg as "city of neighbourhoods" with architecturally designed centres. They were opposed to imagining the city as landscape, and said new concepts were too focused on the interconnections and intermediate spaces between the neighbourhoods. To convince critics, designs had to "fit" and develop Freiburg's particular urban fabric. The design team conducted several walks through all parts of the city, allowing them to feel the city's "vibe", understand how different dynamic elements interact, and conceive of the city as a whole; as a living system. Experiencing the atmosphere, interacting with people, feeling the summer heat (Freiburg has one of the hottest microclimates in Germany) and bodily sensing "where the music plays", was crucial to achieving a proper spatial vision for the whole city, as well as tangible interventions. Innovation means questioning the suitability of the existing fabric and traditional mind-set, identifying particularities, and devising and communicating new landscape perspectives for the transformation of the city. A similar approach was used by the "Raggi Verdi" project in Milan, which introduced the concept of "green rays" to inspire designs for better urban walkways, increasing urban permeability.

Landscape architects can play a major role by contributing their working knowledge (Nowotny) of processes of change. Particularly in informal planning processes, they can contribute to transdisciplinary teams through their understanding of dynamic processes of growth and movement, and their ability to grasp the constantly changing cityscape as an open and inspiring totality.

References

- Austin, G. 2014: Green Infrastructure for Landscape Planning: Integrating Human and Natural Systems. Taylor & Francis, London.
- Diedrich, L. 2013: Translations: radical design for transforming harbour sites. Portusplus, issue 2012, www.reteonline.org.
- Nowotny, H. 2008: Designing as Working Knowledge. In: von Seggern, H., Werner, J. and Grosse-Bächle, L. (eds) Creating Knowledge, Innovationsstrategien im Entwerfen urbaner Landschaften, Berlin: Jovis, pp. 12-15.
- Saunders, D. 2012: Arrival City. How the Largest Migration in History Is Reshaping Our World. Vintage.
- Stein U.; Schultz H. 2015: Capacity-building in the city-region: creating common spaces. In: Planning Theory and Practice; Vol. 16 (2).

Application of Experimental Method in Landscape Design Education

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composition | typology | experimental teaching method | pedagogy

Entirety is one of the most important features of the natural landscape so it should be a fundamental concept in teaching landscape architecture. The current study is associated to the aesthetic approach for clarifying the idea of the whole and the opportunities for creating visually-integrated systems. The main objective is to examine the influence of applying a new method for creating a composition in educational process. In the method, called typological, visual features and formal interactions between compositional elements and the space play an important role. The experiment consists of the following. Two groups of students develop landscape design projects on the same site. The experimental method is explained to one of them and the students are encouraged to apply it in their works. After the projects are finished, the results of both groups are compared. The study ends by identifying the role of the typological method: for enhancing the aesthetic qualities of composition; to clarify the importance of the concept of the whole; and finally, for a better understanding of the landscape design itself.

Introduction

For the improvement of education quality in landscape architecture, various methods are applied (Donadieu, Baser, Fetzler 2012). Most authors conclude that the use of non-traditional methods have a positive effect on motivation and work of students (Zigmunde, Nitavska 2012). However in education, the visual quality of created landscapes is overlooked worldwide (van Etteger 2008, Moore 2010). It could be assumed that within the discipline we have a limited set of tools. The current paper is an attempt for developing design skills in education clarifying some potential aspects of composition.

The aim of the study is to examine the influence of a new method application in the process of education on student motivation and their results. When using the experimental method to create a composition, called typological, what plays an important role is not objects, but their visual features, not functional relationships, but the formal interactions between compositional elements and the space in which they are located. The method is associated with the idea that the composition is a visually integrated system. Determination of basic criteria to create visually integrated systems is done through analogy with ecosystems. The approach is based on the following integrated model (Figure 1).

The Visually integrated system is a set of elements related into a whole, whose links are visual rather than functional. A visual connection means a degree of similarity between two compositional elements in relation to their objective visual (graphical) features - shape, size, orientation, location, texture, and colour.

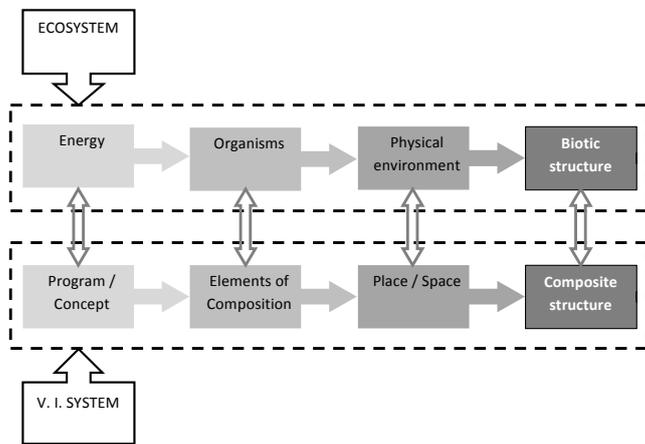


FIGURE 1. Criteria for creating visually-integrated systems. (by analogy with ecosystems).

Criteria		Variation 1	Variation 2	Variation 3			
A	Form creation	a_1	identical forms	a_2	similar forms	a_3	different forms
B	Structure	b_1	connection of all elements	b_2	connection of some elements	b_3	lack of connection between elements
C	Element-background	c_1	elements with background	c_2	elements without background	c_3	elements and background merging

TABLE 1. Compositional criteria and their variations in typological model. (Shahanov 2016)

Materials and Methods

The importance of using models or modelling during design process in education is essential (Hansen, Dam 2012). The current experimental method for creating a composition is based on a model described in a dissertation called „Typology of composition in landscape architecture“ (Shahanov 2016). The model considers the visual connections between compositional elements in two-dimensional space. The interactions between elements are described by three compositional criteria: „form creation“; „structure“; „element-background“ (Table 1). The combination of a single variety of each criterion gives a certain compositional type.

The experiment consists of establishing the role of the described method in developing student landscape projects. For this purpose two groups of students in their third year are selected, who are develop design projects on the same site. One of the groups, used as reference, the students develop their designs using the basic aesthetic principles learned in the composition theory course. In the second group, the experimental method is explained and students are encouraged to implement it in developing their projects.

To establish the influence of the method on students' motivation, a survey has been used. The impact of the method on their results has used an expert's evaluation. Project evaluation is carried out by landscape architects and their selection is balanced between: teaching and design practice; colleagues with years of experience and young colleagues with prestigious awards from competitions; men and women. The experts are asked to assess the compositions of students from both groups, which are mixed. The assessment is made on predetermined criteria: explicitness (a clear compositional approach and subordination to one idea); thoroughness (each element, line, axis is logically connected to others); harmony (the composition is consistent with the basic art tools such as balance, rhythm, proportion, contrast).

Results and Discussion

According to the survey results almost half of the students with the application of a new method, greatly influenced their motivation (Figure 2). All students more or less think that the final outcomes of their designs are due to the new method. Two-thirds of them say that the method is easy to use and most of the students would use it again in the development of landscape-architectural compositions.

According to the expert evaluation four of six compositions or 67% ranked in the first six places were prepared using the typological method (Table 2). 50% of the compositions ranked from 7th to 12th place are also prepared using the method. 33% of the compositions ranked in the last six positions were prepared using the method. On the other hand within 71% of the experts, the cumulative evaluation of the group prepared by the method is greater than that of the reference group.

In addition the general evaluation has determined the relationship between the application of the method and the achievement of the different compositional criteria. When using the method the achievement of „explicitness“ and „harmony“ is higher by 12% and 9% respectively. In contrast, application of the method reduces the composition qualities by 3% regarding the criterion „thoroughness“. In general the use of the method gives 6% better results in terms of aesthetic qualities of composition.

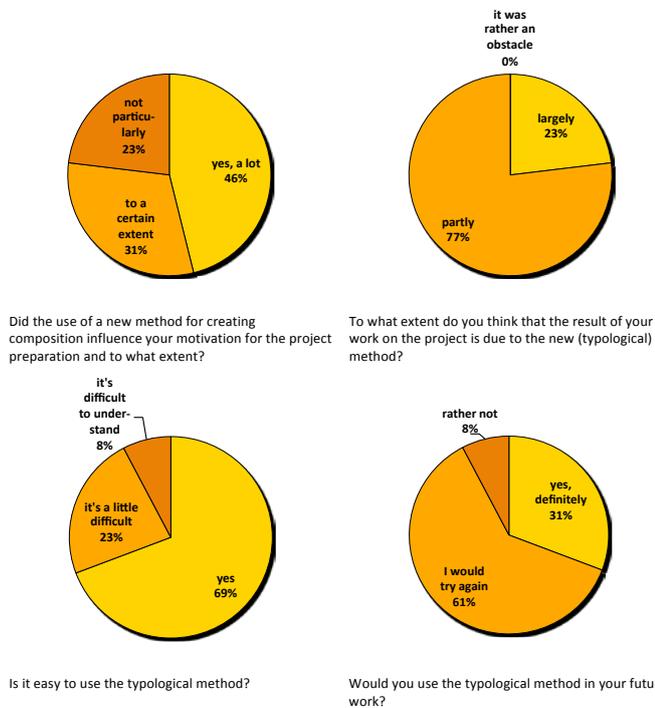


FIGURE 2. Results from the conducted survey of students who participated in the experiment.

Composition	Criterion evaluation			Overall evaluation
	Criterion 1	Criterion 2	Criterion 3	
7*	36	31	33	100
9	40	26	29	95
3*	34	28	32	94
4*	39	28	24	91
6	32	32	26	90
15*	34	24	26	84
13	28	24	24	76
8*	29	23	23	75
18	29	23	21	73
2	27	23	20	70
5*	31	19	18	68
12*	25	18	21	64
16	22	23	18	63
17	22	21	19	62
1	23	17	19	59
10*	24	17	18	59
14	21	20	17	58
11*	21	15	16	52
Overall evaluation of first group (reference)	244	209	193	646
Overall evaluation of second group	273	203	211	687

Note: * - compositions made by using the typological method

TABLE 2. Expert evaluation of student compositions (in points).

Conclusions

The results of the experiment confirmed the thesis that the application of new methods enhances the quality of work. In this case, it consists in a more focused educational process and stronger communication between teacher and students. By linking research, professional design practice and education, students become more convinced of the importance and benefits of the application of different methods.

Since the experiment involves a small number of students, statistically the direct link cannot be proven between the application of the method and the better results. But as the process is more important than the result, significant conclusion is that the use of a new method led to a change in attitude of the students and their willingness to work.

Although the overall assessment of the compositions which used typological method is higher than the evaluation of the reference group compositions, the effects of the method should be accounted differentially. The method is suitable for increasing the explicitness of the composition and the harmonious link between elements, but its use by itself does not lead to a depth of compositional constructions.

According to students survey the used method „creates unity and integrity of the composition“ and „clearly substantiates the relationship between the components“. The expressed opinions and the achieved results show unequivocally that this method helps to clarify the importance of the concept of the whole. This means that in their future work the students will consciously seek to achieve not only environmentally sustainable, but also visually integrated landscapes.

Based on the foregoing inferences about the importance of typological method to better conduct classes, for awakening the interest and motivation of students, to achieve better results, it can be concluded that the application of experimental and hypothetical formulations eventually contribute to a better understanding of the landscape design, not only in education, but also as a whole.

References

Baser B., 2012. The Power of Collaboration in Landscape Architecture Education: Shifting Our Pedagogy with Service Learning Practices. Proceedings of ECLAS 2012 Conference, Warsaw, 424-430.

Donadiou P., van der Toorn M., Vacherot L., Vexlard G., 2012. Precedent analysis and the analysis of plans at Master's level in search of design knowledge. Proceedings of ECLAS 2012 Conference, Warsaw, 450-454.

van Etteger, R., 2008. The aesthetics of landscape architecture and designed landscapes. Dissertation Abstract. Wageningen University, 9 p.

Fetzer E., 2012. Assessing Everyday Landscapes. An Online Seminar about Landscape Awareness and Communication Concepts. Proceedings of ECLAS 2012 Conference, Warsaw, 466-473.

Hansen, P., Dam, T., 2012. Simple models Empower Programming. Proceedings of ECLAS 2012 Conference, Warsaw, 508-508.

Moore, K., 2010. Overlooking the visual: Demystifying the art of design. Routledge, 254 p.

Shahanov V., 2016. Typology of composition in landscape architecture. Dissertation, University of Forestry, Sofia, 201 p.

Zigmunde D., Nitavska N., 2012. Acquiring composition through the students' own emotional experience in landscape. Proceedings of ECLAS 2012 Conference, Warsaw, 501-505.

Trespassing to the River to Reinstate Individual and Public Health – Mind the Gap Between Impaired Inner and Outer Nature

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public health | trespassing | urban rivers

The steep and short alluvial Los Angeles River (aka. wash) seasonally meandered freely across the flood plain. After a great storm flooded one-third of the city of Los Angeles in March 1938 the Army Corps of Engineers began the 20-year Public Works Project creating the permanent concrete channel, which confines the riverbed until today. The former right of way of the River has been designated as a NO TRESPASSING territory due to its mono-functional designation as a seasonal flood channel - even if utilized only for a few days each year.

Since 2013 sections of the L.A. River have become legal for public access again. A citizen driven movement has opened up the realm of the river by breaking the law through trespassing.

The paper explores the ambiguous circumstances of trespassing relative to human and environmental health, urban hygiene and self-determination as a broader health concept of unimpaired human existence.

The hypothesis underlying this paper is that the people of Los Angeles rediscover and civilize the realm of the river by trespassing in order to reinstate a self-determined relationship between them and the lifeline of their city. This offers new relationship between individual well-being and environmental and public health.

This paper begins to establish an argument for a qualitative understanding of a mutual relationship between individual and environmental health and how it constitutes and reflects cultural significance of public space.

Conventional assessment of public and environmental health is typically determined by measurement of pollutants, contamination and other quantifiable environmental data catering to predominately quantitative decision-making protocols and policies. If spreadsheet metrics are one rational to represent quality of life - the WHO already provides a more holistic and open qualitative definition of health.

“Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (WHO 2012)

If the sum of individual choices in everyday practice can accumulate to environmental degradation and negative impacts on health e.g. by automobile centered lifestyle and its emissions can these trends also be reversed to the better? Can self-determined actions in public space also unleash cumulative positive effects for a site and its accessibility and appreciation of the public?

Alternative hedonism (Soper 2008) outlines a set of non-affirmative everyday practices overcoming the predominant cultural determinism of capitalist consumerism by a set of self-determined activities. Instead of assuming the good life would consist of rewarding oneself by purchasing dispensable consumer goods, alternative hedonism suggests the good life resembles around collective activities. Sharing, lending, recycling, repairing and other non-consuming practices are celebrated as participation in self-determined collective and joyful experiences of having a different set of choices which aggregate to place making and a sense of belonging, eventually identity.



FIGURE 1. Contemplating man with hat, overlooking Los Angeles Rivers newly concrete bed. Image credit: L.A. Times 1940s.



FIGURE 2. Movie Still: romantic retreat at L.A. River soft bottom riverbed - Drive 2011: Nicolas Winding Refn.

Managing Urban Rivers

How can the changing objectives of managing and appreciating urban rivers be understood relative to the above concepts of personal and environmental health?

The channelization of the L.A. River can be understood as an emblematic project of subduing nature. Taming and controlling the seasonal ›wash‹ into a concrete lined storm-sewer channel represents the far end of the paradigm of domestication and sanitation. While the projects main intent is to protect the residents along the river from rare flood events, it also prevents all public access of any citizen to the river at all times.

The more recent grassroots rediscovery and advocacy by “Friends for the L.A. River” among others provokes a closer reading of the shifting perception. Since 2013 Los Angeles citizens may access parts of their river again without risking a \$1,000 fine or imprisonment for trespassing the rivers fenced off territory.

In 2013 coinciding with the 75th anniversary of the channelization, the very US Army Corps of Engineers, which lead the 1940s public works project, pitched a billion dollar proposal to undo 11 of the 51 miles of their own prior project and ›re-naturalize‹ the concrete channel profile.

Hollywood Registering a Cultural Evolution

A sequence of Hollywood movies indicates a changing perception of the river. In retrospect the regression of crime scene in Chinatown (Polanski 1973) to car-chases, to illicit car races in Grease (Kleiser 1978) to retreat in Drive (Renf 2011) can be understood as a logical and necessary cultural evolution of learning to reclaim the realm of the river.

The epic boy-meets-girl scene is located in the same concrete channel, but this time turns into a quasi-romantic getaway (Drive 2011). After a short joyride in the channel the main character stops the car at one of the soft bottom sections for a stroll. When the camera pans away from the couple the glimmering tree leaves in the late evening sun are littered with plastic bags and other residue of the last flood. Still one perceives a moment of dignity, sincerity and integrity of the characters being in sync with the space. The chosen site of this particular retreat is not in a pristine place outside the city limits, but in the midst of an urban industrial ecology with the

appearance of an emergent riverine forest. The biographies of the single mom and the motorcycle stunt driver are just as complicated and contradictory as the urban ecology of the river, which trickling base-flow on any dry day consists of the effluent of the L.A’s sewage treatment plants upstream.

Transgressing Outer Nature

How have we arrived at a fenced-in, mono-functional, hostile corridor, which has sunk in as a collective image of a place for illicit activities?

Let us unpack the transition of the ›No trespassing‹ imperative from its original aim of protecting the individual physical integrity against assault to the projection of harmful intrusion towards private property and finally to its odd outcome: the exclusion of humans from formerly public territory!

Trespassing to the territory, as a legal constraint of citizen’s behavior is the far end of a cleansing operation that reduces entire territories to one exclusive function and declares other uses e.g. leisurely human occupation to be incompatible with it. Few episodic risk events per year designate the storm water channel as a zone to be “cleansed” from any other conflicting use at all times.

A self-determined human activity of going down to visit the river for the pleasure of it, has been prevented by separation of functions and the resulting exclusive use of space. Leisure activities are being substituted by driving to other mono-functionally designated urban areas; e.g. - get in your car and go shopping or to an indoor “health-club”.

The deliberate counter culture act of trespassing to the L.A. River turns into a moment of healing the obscured and ill-conceived relationship between the citizens and their river. The fact that Los Angeles citizens have recently started to approach their rivers again suggests that trespassing can be an act of maintaining personal health as an expression of self-determination.

Going down to the river implies ›empathy to an animate nature worth rediscovering. It challenges the dogmatic top-down security mandate of imposed spatial segregation and marginalization. The grass-root movement suggests a new link between inner and outer nature - neither of them understood as pristine, both reflecting their own hybridized condition.



FIGURE 3. Urban Cowboys riding into the concrete channel. Photo credit: Joerg Sieweke

The limits of reductive modernist planning strategies of spaces designated to mono-functional specialization and exclusion become self-evident in overregulated condition of the river. Trespassing contests the modernist paradigms of spatial division, cleansing and purity. These paradigms are slowly beginning to be re-adjusted from regimes of control and order to negotiation and collaboration between natural and social processes, again.

A New Coherence Between the Self with Inner and Outer Nature

The growing disconnect between inner and outer nature can be reconciled by accepting both their imperfect states by showing interdependencies between altered urban nature and urban culture. The free will to express human nature by acts of transgression and trespassing begins to undermine the authoritarian spatial and functional divisions of space of modernist planning. In the case of L.A rediscovered riverfront provides an arena for mixed-use, urban renewal and recreation. This transition of societal values expresses a beginning shift of managing the long shadow of modernity - more precisely the paradigms of nature in the ongoing project of modernity. Recent concepts as environment still refer to a discrete realm of nature - distinct and outside of us. We begin to critically reflect our cultural construct of rationalizing nature as a phenomenon not sufficiently described by natural sciences. The deliberate and severe training of discrediting animate nature needs to be reflected as a late outgrowth of secularization and enlightenment. Any notion of an animate or vivid nature would immediately be condemned as naïve or worse esoteric - don't go there. Only slowly we become conscious of a rationalized nature concerning the self-perception of our human nature. A new interest in animate qualities of nature can be perceived as we are bridging from our inner to outer nature - both understood as products of ongoing natural/cultural coevolution an innately animate by nature.

Transgression of Inner Nature

Current research of the "human biome" provides material evidence of inner and outer nature being closely interwoven at the single building block of life in the cell. E.g. nitrogen chemically synthesized by the Haber-Bosch-Process is widely spread as artificial fertilizer in our environment. Besides supplying the agricultural metabolism of today's world population at an industrial scale, its abundant residual presence can be found in any eutrophic water body and eventually can be traced as nitrogen compounds resembling the cells of the human body.

We are beginning to understand that the human cells are not only influenced by the environment, but coexist and interact with the human biome - the sum of all bacteria exceeds the number of cells in our bodies and has long been underestimated in its performance. Our embodied individual microbial coexistence is no longer understood only essential to human gut functions, but also closely related to key function of the nervous system; all the way to brain functions (Cryan 2014). The human biome resembles a fluent exchange of microbes of the physical environment permeating the body as an only alleged boundary of inner and outer nature. Current biome research even suggests a personal microbial cloud, which continuously permeates the non-discrete boundary of human skin, while remaining loosely associated with us (Groskin 2016). Analog the extend of microbial transgression between body and environment; it appears less exotic to consider transgressing provisional legal boundaries between inner and outer nature. The deliberate act of Trespassing to the territory appears as the logical consequence of reconnecting inner and outer nature.

Bridging the Gap

The spatial division of functions in modern urban planning and the division of functions of inner-disciplinary specialization in neuron vs. gastro medicine mirror an analog mindset. Despite the great progress and accomplishments we are becoming aware of exclusionary dichotomies as shortcomings, revealing the limits of over-specialization of modern science. Individuals actively demanding access to urban areas excluded from the public may be intuitively transgressing these boundaries in order to bridge the gap between them.

The public begins to resist and reclaim these projects of technocratic legacy for the sake of their unimpaired well-being aka. HEALTH.

References

- Chinatown (Movie, 1973) Director: Roman Polanski, feat. Jake Nicholson.
- Cryan, John (2014) Can the Bacteria in your gut send messages to your brain? Microbiologist Sarkis Mazmanian and John Cryan, Professor of anatomy and neuroscience University College Cork, Ireland Science Friday Podcast 22. Aug 2014.
- Drive - there are no clean getaways (Movie, 2011): Director: Nicolas Winding Refn; feat: Ryan Gosling.
- Grease (Movie, 1978) Director Kleiser, feat. John Travolta
- Groskin, L. (2016) Your very special microbial cloud, Science Friday podcast January 25, 2016 <http://www.sciencefriday.com/videos/your-very-special-microbial-cloud/>.
- Preamble to the Constitution of the World Health Organization (WHO 2012), New York, 1946.
- Soper, Kate (2008) Alternative hedonism, cultural theory and the role of aesthetic revisioning in: Cultural Studies Vol. 22, Issue 5, 2008 Special Issue: Cultural Studies and Anti-Consumerism: A Critical Encounter pages 567-587.

Weak Contexts in Evolution. Density and Limits of the Urban Margin of Cagliari.

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urban margin | density | architecture of territory | multiscale | metropolitan area

The growth of contemporary cities and the expansion of its margins push us to face a number of conditions typical to those of delicate context in evolution, where major weaknesses appear strongly.

The margin is widely regarded as a point of tension and transition, intriguing both as an abstraction that allows us to focus on the major challenges of the contemporary city and as a complex space where multiple factors from all different spheres concretize in a system of objects that are related to each other.

Expanding their limits, cities overlay on both natural and anthropic existing systems, and so it constantly generates new interactions of great interest. It is necessary to widen the territory of architecture to face this circumstance in an active and disciplinary way, taking a point of view which is capable to cover the architecture of territory. Orography and idrography, infrastructural network and commercial/production areas have to be considered as the skeleton that supports the expansion of the city. Through all the scales, they generate modes and devices that define the limit as a complex interface. The evolution of the urban system of Cagliari, the case study of this research, confirms this precondition.

For centuries, settlements have been regulated by a delicate ecosystemic relationship between anthropization and territory, a relationship that produced forms, simple spaces and complex aggregations to accommodate life and communities and nowadays shaded by technic and technologic progress. But which are the design processes that convert the necessities of contemporaneity in spaces and devices, influencing the relationship with the territory? The goal of the research is to investigate these processes of the metropolitan margin starting from very specific samples, to highlight their spatial potentiality and weakness, the capacity of small-scale devices to influence wider urban apparatuses and possibly the metropolitan system itself.

The growth of contemporary cities and the expansion of its margins pushes us to reconsider a number of conditions typical of these unstable and rapidly changing contexts, where their weaknesses appear even stronger. In particular it is important to acknowledge that much of the planning in the last decades has worked mostly to restore and preserve the historic centres, considered obsolete and partially abandoned after the war.

At the same time periphery, now often confined within an extremely negative shade, has been built and still continues to grow nowadays, pushed by a large amount of economic and political pressures. Peripheries are nothing but the realization of a series of contingencies that occur in a given site at the same time, producing different spatial conformations. While expanding its boundaries with great intensity and power, overlaying on natural and anthropic systems, peripheries generate both prospective systems of great interest and a series of major criticalities. This kind of urbanised landscape (Sieverts 1997), a complex product of social, economic and productive factors, very unstable and still inside an on-going process of evolution, certainly lacks the features and the characteristics of the historic towns, leaving its spatial characters still undefined and to be understood. It is important to underline that the planning of these areas has been applied only through a mere quantitative approach, underestimating the spatial consequences and the relationship that the newly built areas interlace with the context that they are set in.

Following the technical and technological development of the last century, along with the transition from an economy mainly based on agriculture to a tertiary-based economy, the relationship between the city and the territory and its elements has also changed profoundly. The boundaries between the urban areas and the rural areas have changed, and so have the way that the urban areas take place on the territory and the relationship with nature: densities and morphotypes

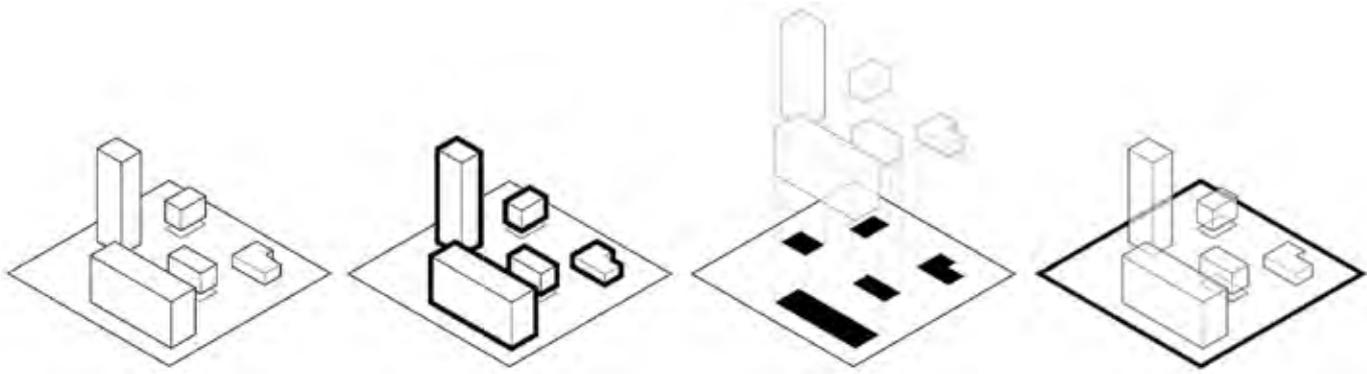


FIGURE 1. Density and its spatial components. Density itself, relationship between objects, relationship with the soil, relationship with the limit.

are superimposed to the ground showing that the direct link between the object and its context is much feeble than in the past.

To investigate this new relationship, in a way that considers together quantitative measures and spatial possibilities, one of the main ideas that innervate this thesis is to take density, one of the most utilized planning measures, and to break it down in a set of three spatial components: relationship between the objects, relationship with the soil and relationship with the limit. These parameters are then verified while being utilised for the analysis of the case study. (Figure 1)

Cagliari is the main town of Sardinia. It is located at the southernmost point of the Campidano plain and its metropolitan system, which is composed of seventeen towns and has been recently instituted as an administrative entity, and overlaps the water system that feeds the wetlands of Cagliari and Molentargius. The two mountain masses of Sulcis and Sarrabus-Gerrei, respectively west and east, clearly delimit the southern end of the alluvial plain of the Flumini Mannu, where all the towns that are part of the Cagliari metropolitan system are.

With its nearly 450'000 inhabitants and 1248kmq of occupation, Cagliari is a very atypical metropolis.

The observation of the evolution of the urban system that led to the metropolisation of Cagliari and its hinterland centres in relation to the hydrographic system highlights the incongruity between the historical limit and contemporary edge.

It can be observed very clearly, that the position on the territory city centres are dictated by the historical average flood area of the river and its tributaries, perfectly shown by the presence of alluvial deposits on a geological level. (Figure 2)

Since the early '60s, the service sector, due to the consequent growth in appeal of the city, which opposes to the countryside and the construction of highways, have produced the gradual expansion of all the little towns skimmed by the roads. The need for new buildings to accommodate the large number of people who gravitate around the city has been parallel to the occupation of land occupied by agriculture fields surrounding each of the towns. During their evolution, every town has shifted its centre of gravity of growth towards the roads.

(Figure 3)

In this scenario, a number of conclusions can be noticed, concerning the density, considered as a decomposed parameter, its relationship with nature and more generally its landscape.

The old ecological limit, which respected the flood of the river, a limit which cannot be valued, is considered obsolete even if its rupture is largely responsible for the increase in flooding after improvise heavy rains, typical of Mediterranean climate.

Along with it, the large horizontal expansion of the city has led to the need for a large number of paved roads and car parks, leads to poor soil permeabilization in areas which are delicate precisely for their closeness the waterways, and is reducing enormously the presence of green within the city.

The highway becomes the new limit to which the city expands: a limit that is attractive, hardly surmountable, and beyond which there are only small companies, and that, like the walls of a walled city, mediates the relationship with agricultural fields, with a clear interruption avoiding colonization and preserving them and their function.

The fields that are close to the village, now abandoned, will gradually be occupied by new buildings, are temporary and small, but are important nature reserves that create distances between the buildings and built-up areas, making the perceived density more feeble. As if it were a popular park, this space is used for sports activities.

Clearly, for each one of the density components a number of solutions can be identified.

To summarize, the periphery is emerging as a new landscape with distinctive spatial qualities and that can no longer be designed only through quantitative planning standards. We need to understand what its problems are, related in large part to its more adversarial relationship with the land and with the ground, in order to propose solutions and improve it as a complex landscape city. The aim of this research is primarily to understand and indicate what possibilities of a design process that considers to synthesize the major contingencies that characterize the periphery are, turning them into spaces that are the result of a conscious awareness of the relationship between the different components of density and landscape.

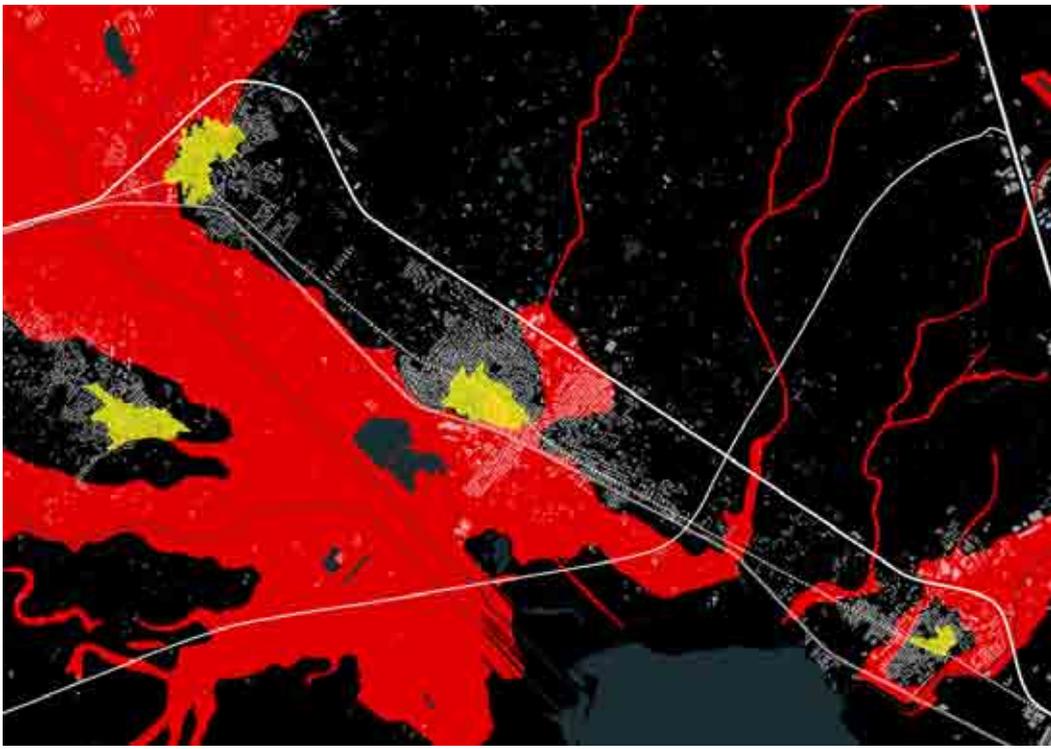


FIGURE 2. Urban system along one of the highways (ss 130). In yellow, the historic town. In red, the alluvial deposits. In white lines, infrastructures.

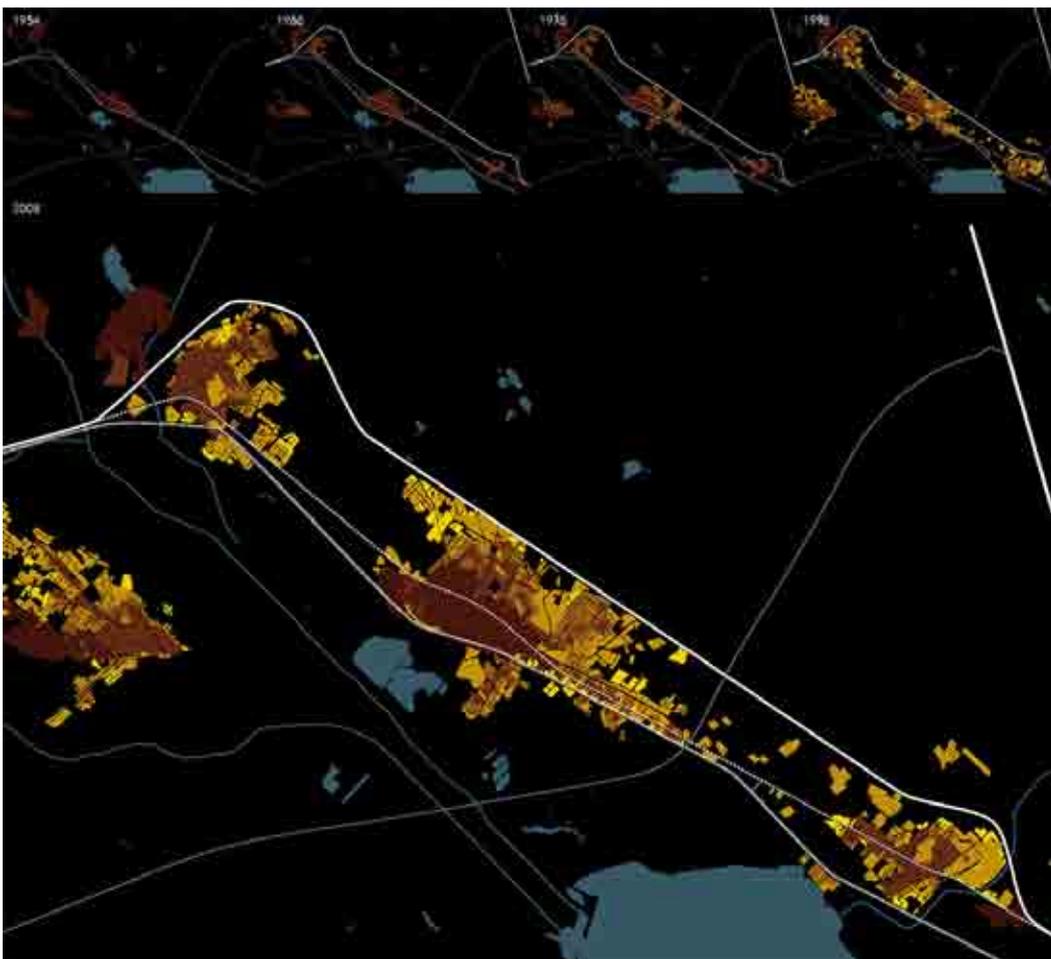


FIGURE 3. Urban system along one of the highways (ss 130). From dark red to yellow, the growth of the urban system towards the road.

References

- Caniggia, G., Maffei, G.L., 1979. *Composizione architettonica e tipologia edilizia*. Venezia: Marsilio Editore.
- Mangin, D., 2004. *La ville franchisée*. Paris: Éditions de la Villette.
- Mininni, M., 2012. *Approssimazioni alla città*. Roma: Donzelli Editore.
- Panerai, P., 1999. *Analyse urbaine*. Marseille: Editions Parenthèses.
- Papillault, R., 2012. *Toulouse Territoires Garonne*. Toulouse: Presses universitaires du Mirail.
- Secchi, B., 2011. *Postfazione*. (in *Landscape of urbanism*, curated by Ferrario, V., Sampieri, A., Viganò P.). Roma: Officina Edizioni.
- Sieverts, T., 1997. *Zwischenstadt. Zwischen Ort und Welt, Raum und Zeit, Stadt und Land*. Braunschweig: Vieweg.

Different Ways of Interpretation of Historical Gardens by Landscape Architecture Students

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historical garden at educational facility | student's workshop |
area study | interpretation

Historical parks and gardens represent specific design works that are very sensitive and they belong to the most endangered cultural monuments all over the world. The most specific features of such gardens are their dynamic changes and time development.

The purpose of the proposed paper is to present the outputs of our project focused on garden presentation that can be interpreted in time period – visual presentation and presentation via other senses.

In the framework of the project, we have verified the present state of 20 selected historical gardens in Slovakia. Later a student's workshop has been organised with the objective to revitalise the historical garden in our university educational facility in the historical town of Kremnica. Students had to take into account the functional use of the garden and its material symbiosis between historical form of the garden, and its new social and educational function.

The paper will present suitable landscape design of the facility supporting the creative skills of students in the outdoor environment in order to promote historical Slovak gardens via different ways of its presentation.

Introduction

Historic parks and gardens are specific segments of art. Historic gardens being an art of landscape architecture have a great cultural and historic value. They are valuable also in terms of nature, science and sociology. The most specific property of landscape art is its continual variability in time – live composition.

The gardens have been and still are a great inspiration for a lot of famous artists. They are also very vulnerable in terms of its natural spirit and actually they are one of the most endangered cultural relics in Slovakia (Hudáková 1988). The potential reconstruction works shall be carried out in accordance with the Florence Charter [1], mainly with the Article 15, which states: *“No restoration work and, above all, no reconstruction work on a historic garden shall be undertaken without thorough prior research to ensure that such work is scientifically executed and which will involve everything from excavation to the assembling of records relating to the garden in question and to similar gardens. Before any practical work starts, a project must be prepared on the basis of said research and must be submitted to a group of experts for joint examination and approval.”* (ICOMOS 1982).



FIGURE 1. Current Photo of the Garden



FIGURE 2. Visualisation of Exterior Exhibition

Research, Methodology and Methods

The presented interesting example of a historic garden interpretation is a result of an assignment of a landscaping and architecture study of the historic garden on the premises of the Communication and Visualisation Learning Centre of the Academy of Fine Arts in Kremnica (a small historical time in Central Slovakia). The garden, together with the Communication and Visualisation Learning Centre of the Academy of Fine Arts in Kremnica (Figure 1), is situated directly on the slope beneath the walls of the town castle in Kremnica. The shape of the garden is irregular, copying the shape of the contours.

Its limits are defined by the castle wall in the East, a corridor leading to the castle in the South, a historically looking metal fence in the West and the building of the Learning Centre in the North. The overall size of the premises is 1740m² and the garden covers the area of 1200m².

In October 2014 the garden held an intensive workshop attended by students and teachers from the Institute of Landscaping and Garden Architecture at the Faculty of Architecture of the Slovak Technical University in Bratislava. This workshop aimed to look for ways of revitalising the garden while maintaining its historical character on one hand and providing space for the activities of the Communication and Visualisation Learning Centre on the other.

The methodological processes followed several steps – historical research (data collection based on historical maps, vistas and postcards), field survey (analysis of natural elements, function and operation analyses, composition analysis, current social demands and requirements), design proposal (graphical interpretation and composition). Groups of trees represent the dominating natural features, while the castle walls represent the dominating architectural feature. When it comes to composition, open views of the town and the surrounding nature were also important.

Despite a high number of historic gardens on the territory of Slovakia, literary documents do not contain much information, especially those of period origin. Even contemporary bibliography is scarce, the research of historic landscape is not

really systematic and the data is rather fragmented

The on-site research mainly focused on evaluation of existing fragments and on identification of non-existent fragments of the garden and on compilation of photographs.

Results

The previous research here aimed to present a historic landscape art to society as a live and still developing composition, which can be interpreted in time, by visual and other human senses. The research focus has been put on both valuation and categorization of the historic landscape art.

The research outputs could be used as an eminent base for university education – especially for the landscape architecture programme. The research scope could be applied in a lot of landscape curriculum subjects such as „Historic landscape structures“, „Historic green restoration“, History of landscape architecture and the studio modules specialized to historic landscape heritage restoration. Studio modules were oriented on student activity and participation in order to understand the historic landscape value, improve their theoretic and practice skills. It will be provided by the education system and workshops.

The unusual combination of art subjects teaching at the premises of historical garden makes this assignment highly specific while creating a new dimension of functionality and revitalisation of the garden.

The results of the previous historical research produced very little data. All we know is that the garden was a part of a ring of gardens situated on the slopes beneath the town walls. The maps and the other visual materials do not show any buildings or other peculiarities.

The analysis of the natural elements included the findings of a detailed dendrological study focused on the species and the current state of the trees and the herbaceous layer. The garden contains 17 trees of the following species: *Cerasus avium*, *Juglans regia*, *Malus domestica*, *Malus domestica*, *Picea abies*, *Prunus domestica*, *Pyrus communis*, *Thuja orientalis*. The garden also features a few bushes, particularly *Buxus*



FIGURE 3. Visualisation of Central Garden Area



FIGURE 4. Visualisation of Central Garden Area

sempervirens, *Sambucus nigra*, *Corylus avelana*, *Syringa vulgaris* and *Crataegus monogyna*. The sloping parts of the garden are widely covered with *Hedera helix*. The herbaceous layer consists of grasses and herbs, although we have also detected the presence of some ornamental species, such as *Aquilegia caerulea*, *Vinca minor*, *Hellborus niger*.

During the survey of the architectural elements we focused mainly on the system of supporting walls and terraces, the remains of a staircase and the remains of a fountain. The garden features support walls, dividing it into four levels. The walls are made of natural stone and in a few places they are damaged and require reconstruction. The staircase that formed an access to the terraces is also in disrepair. In front of the house there is the base of a fountain.

The function and operation analysis was completed upon the demand of the Communication and Visualisation Learning Centre and in accordance with the basic guidance of the Regional Monuments Board. The garden space is to be divided into several functional and operational parts:

- Central representative space connected to the building of the Learning Centre
- System of terraces to be used mainly for educational and work purposes
- Relaxation area
- Free spaces
- Herb garden accessible from the kitchen

The composition analysis defined the placement of individual parts and elements within the overall composition of the garden. The garden has one main composition space and several side spaces. Groups of trees represent the dominating natural features, while the castle walls represent the dominating architectural feature. When it comes to composition, open views of the town and the surrounding nature are also important.

Based on the data gained in the research and the field survey, we suggest three possibilities of the garden revitalisation, named the Joy, the Circle and the Wave (Figures 2-4)

The results of previous research showed the possibilities of revitalisation and interpretation of the garden directly at premises of the garden resulted in a very interesting way of studio teaching way. The objective of this part of the research was to suggest realistic forms of revitalisation of the historic garden of the Communication and Visualisation Learning Centre of the Academy of Fine Arts (Jorgensen 2009; www.heritagetechnology.co.uk). The garden plays a very specific role, mainly as a place of learning for future artists. Alternative student's designs met the demands of this role and despite the small space and challenging terrain create opportunities for various kinds of activities. The garden has also a potential to become the space of artistic interpretation, thus acquiring a whole new dimension.

The involvement of the students at the workshop also rendered valuable results. The students had the opportunity to learn basic field study skills, correct methodological processes involved in revitalisation of gardens and present and advocate their suggestions and projects during the discussion time.

References

- ICOMOS-IFLA: Historic gardens (The Florence Charter). International Committee for Historic Gardens. Florence, 1982.
- HeritageTechnologyLtd (<http://www.heritagetechnology.co.uk>).
- HUDÁKOVÁ H. 1988: Bratislava, mapa z roku 1765. Bratislava: Slovenská kartografia. 16 s.
- Karsten Jorgensen: 3D-HISTORY in gardens and landscape, ECLAS Conference 2009 - Landscape and Ruins.

Creating Well-Rounded Designers of Prison Environments: Transdisciplinary Action Research, Design and Teaching

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corrections | service learning |
 transdisciplinary research | landscape architecture

Student service learning projects open the door for engagement in design work that is typically not part of a traditional landscape architecture programme. This paper explores transdisciplinary learning outcomes extending beyond traditional goals associated with two studio and two seminar courses in which students worked directly with incarcerated women and correctional staff to create therapeutic landscapes within a prison and their responses to this unique learning experience.

Service Learning and Environmental Justice

Imagine, as an undergraduate landscape architecture student, being introduced first hand, to the real world of designing therapeutic environments with a marginalized population; women serving time at the Iowa Correctional Institution for Women (ICIW). What are some first thoughts? Fear, anxiety, superiority, or perhaps, empathy?

Incarceration is a global response to criminal behavior as is housing offenders in environments severely lacking in environmental interest (Toews 2016; van der Linden 2015; Wener 2012). Absence of well-designed therapeutic outdoor spaces results in prolonged occupational deprivation and increased aggression (Molineux & Whiteford 1999; Kuo & Sullivan 2001). Because interaction with nature positively impacts health and wellness for all people (Adevi & Lieberg 2012; Diamant & Waterhouse 2010; Thompson & Aspinall 2011), design of correctional environments is important to the health, well-being, and security of incarcerated individuals and staff. To extend therapeutic benefits to correctional environments, we must engage the new generation of landscape architecture students who will be responsible for taking this movement forward. Through student community service-learning, we can transcend traditional academic boundaries and combine the expertise and advocacy of many disciplines to create a shared vision for a just and better world. This paper introduces the ongoing collaboration between Iowa State University Department of Landscape Architecture (ISU-LA) and ICIW. This project redefines a stark prison environment, purposefully and meaningfully engages incarcerated women, staff, and ISU-LA students throughout the design and build processes, and integrates transdisciplinary research with teaching to provide learning experiences for offenders and students and to open the door for students, upon graduation to use their newfound skills to engage in further restorative justice

focused work and for offenders, upon release, to use their skills to obtain employment in green industries.

Programme Structure, Goals, and Evaluation

Since the inception of ISU-LA and ICIW collaboration, we have trialed multiple structures and modes of student-offender engagement in the design process. The most effective structure focuses on maintaining the programme year-round through a process of deeply engaging ICIW women and staff with the students and a transdisciplinary research team. The research team – from environmental psychology, occupational therapy, criminal justice, and landscape architecture – combines the expertise of behavioral/social science, design, and allied health to develop and implement ongoing evaluation and research. The two programs run simultaneously, each supporting the other; one focuses on expanding and maintaining improvements to the environment and related programming, while the other researches the interventions' impacts. This model is significant because students are involved in both programs, thus gaining deeper understanding of the importance of using evidence-based design precedents to support their design concepts.

Studios and Seminars

To date, two studios and two seminars have redefined the prison landscape, with the following learning outcomes shaping the projects:

- Conduct a literature review on past and current designs for prison environments and incarceration theories to inform design solutions.
- Develop and present innovative design solutions to prison administration, design professionals, landscape architecture critics, and offenders.
- Explore personal values regarding perspectives about and treatment of marginalized and diverse populations (especially offenders and victims) and the public.

During the first two courses, student teams generated design proposals for the entire ICIW campus, which led to the development of the first therapeutic garden, the one-acre garden called the Multipurpose Outdoor Classroom (MOC). After the success of the MOC, the most recent seminar course began working at a men's institution.

Design-Build

Since 2013, the ISU team, along with offenders and staff, designed and constructed three therapeutic landscapes -- the MOC, a decompression area for staff, and a healing garden for women confined in the mental health units – as well as a production garden. The goals of the design-build include:

- Develop an ongoing programme with, not for, the community/client.
- Prioritize the needs and preferences of the community/client over student design preferences.
- Learn how design translates into reality and redesign when a project is not going as planned.
- Learn construction site preparation, management and safety techniques in a highly secure environment.
- Safely operate equipment.
- Source and order plants and materials.

These goals aim to meld technique with empathy.

Assessment Methods

In a typical studio or seminar, it is common for 10% of the grade to be assigned to the evaluation of engagement, participation, and teamwork. For these studios, a larger portion of students' grades (25%) derives from the quality and quantity of engagement with the incarcerated women and staff, as a way to emphasize the importance of the design process and relationships. The remainder of the assessment included project research (25%) and final design and presentation (50%).

Viewing Student Reflections Through a Transdisciplinary Lens

Preliminary analysis of student reflections identify several key themes related to impacts on student learning, themes which speak to disciplines of criminal justice, occupational therapy, and landscape architecture.

Perceptions of criminal justice system and offenders

Students noted transformed perceptions about criminal justice and incarcerated people. One student wrote:

"It was really an eye opener of how numbing and inhibiting jail is, and how someone can lose human interaction and developmental habits when you are restricted. This makes it even more important that the rehabilitative and therapeutic processes are used to their fullest potential."

They also noted, sometimes with surprise, women's existing knowledge and excitement for the projects. A student reflected *"how enthusiastic they were and how happy they seemed to share their voice in hopes of seeing their home change for the better. They were insightful, bright individuals that want COLOUR in their lives."* Women were no longer just offenders; they were fellow designers. These changed perceptions contributed to the development of empathy.

Design to meet needs unique to incarcerated women and staff

Students realized that their designs needed to address the needs, safety, and daily life activities of those who live and work at ICIW. A student noted that *“they had a lot to say about the landscape. They were very concerned for the well being of the staff and the visitors and each other. And they really knew what they wanted.”* Students gained valuable insight into what incarcerated women and staff viewed as necessary to facilitate women’s health and daily life activities. A student noted, with surprise, *“how willing the counselors were to have outdoor classes”* and that they had already used the outdoors for programs.

Engagement with a real world client

Students spoke of the learning achieved by engaging in a real world project from start to finish. A student reflected:

“I have never had the opportunity to present a whole design idea to a client, or a room of clients. ... I learned a lot about presentation style and what is important to include and what is important to exclude when trying to keep a client’s attention.”

Students expressed appreciation for the opportunities to develop knowledge and skills in, for instance, the grading, planting, programming, circulation, budgeting, and project planning and management. A student noted learnings about *“what it’s like to work with a real client, what it’s like to collaborate with an architecture and engineering firm.”* All in all, students completed the course feeling like a “rounded designer.”

Future Research

Through the ongoing evaluation of student projects at ICIW and other Iowa correctional facilities, we are developing an evidence base validating the need for therapeutic outdoor environments at correctional facilities. Preliminary results are positive, indicating that interaction with nature is healthful. Future study will continue to measure mental health outcomes as well as physiological and cognitive changes that occur through interaction with nature inside correctional facilities.

References

- Adevi, A. A., & Lieberg, M. (2012). Stress rehabilitation through garden therapy: A caregiver perspective on factors considered most essential to the recovery process. *Urban Forestry & Urban Greening*, 11(1), 51-58.
- Diamant, E., & Waterhouse, A. (2010). Gardening and belong: Reflections on how social and therapeutic horticulture may facilitate health, wellbeing, and inclusion. *British Journal of Occupational Therapy*, 73(2), 84-92.
- Molineux, M.L., & Whiteford, G.E. (1999). Prisons: From occupational deprivation to occupational enrichment, *Journal of Occupational Science*, 6(3), 124-130, DOI: 10.1080/14427591.1999.9686457
- Kuo, F.E. & Sullivan, W.C. (2001). Aggression and violence in the inner city: Impacts of environment via mental fatigue. *Environment & Behavior*, 3(4), 543-571.
- Thompson, C.W. & Aspinall, P.A. (2011). Natural environments and their impact on activity, health, and quality of life. *Applied Psychology: Health and Well-being*, 3(3), 230.
- Toews, B. (2016). “This backyard is my serenity place”: Learnings from incarcerated women about the architecture and design of restorative justice. Manuscript submitted for publication.
- van der Linden, S. (2015). Green prison programs, recidivism and mental health: A primer. *Criminal Behaviour and Mental Health*, 25(5), 338-342.
- Wener, R. (2012). *The environmental psychology of prisons and jail: Creating humane spaces in secure settings*. New York, NY: Cambridge University Press.

Traces in the Landscape – An Alternative Memorial Design Practice

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landscape design | memory | traces | process | transmission

Contemporary practices in landscape architecture need tools for dealing with memory. Approaching this from the field of memorial design, this paper proposes an alternative approach based on the concept of the trace. A trace is defined as a physical entity in the landscape that makes a relation to a past narrative. Deriving principles from precedents, an insight is given into the application of this concept and its potentialities are investigated. Working with traces allows us to avoid the shortcomings of other approaches in memorial design, such as the autonomy from surrounding context, the resistance to transformative processes and the reliance on metaphors. It becomes an approach which brings together past and future in the present condition.

"We awaited memory, it is the memorial that came... And how could we do otherwise?" (Debray 1999: 36)

"Only traces lead to dreams"
(Char 1986, quoted by Debray 1999: 41)

Landscapes are carriers of memory. At the intersection of landscape, memory and design lies the practice of memorial design. An important ground for memorial design is found in post-disaster landscapes. In this context, the project is expected to mediate the relation between a community, or society, and a given collective trauma, through spatial intervention. But whilst contemporary practices explore an increasing diversity of responses to post-disaster landscapes, memorial design is still too often reduced to the design of monuments. Landscape architecture requires tools for dealing with various issues of memory. Therefore, looking at alternative forms of mediation with the past in space and place, this paper presents the idea of the trace as an operative design element. The trace is no novel idea in landscape architecture, however, its use in answer to post-disaster landscapes remains scarce.

From Precedents

Landscape architects have developed practices that build upon this idea. The tiles in the Parc de Lancy (Text Appendix 1 and Figure 1) and the stone artefacts of the landscaped hills surrounding the Acropolis (Text Appendix 2 and Figure 2) illustrate the setting of traces in urban projects. In these cases, the trace is one of several elements in the design. It creates engagement of the beholder by triggering some forms of questioning and imagination. It allows to feed the present state of the place with information about the past. When it comes to memorial design, the use of traces is less common, and its supporting theory is practically absent. Some cases do follow

This project consists in the design of a small urban park that reveals the river running through the site. A curious detail of the project provides a valuable example of a created trace. In several locations in the park, small combinations of white and blue tiles are embedded in the concrete of a curb, a slab or a fountain. These varying compositions are reminiscent of expressions in some coded language. Their meaning is not entirely revealed by the design. The tiles start telling a story and awake the curiosity of the visitor. They set a first interaction, from which the beholder starts interrogating himself and the site. Through this, he is able to make his own reconstruction of the past, through observation and imagination. One could say that these tiles are the sparks that start the work of memory.



FIGURE 1. Tile composition in Parc de Lancy. (Source: Sarem Sunderland)

APPENDIX 2. Landscaping of the hills surrounding the site of the Acropolis, Athens, Greece, 1954-57, Dimitris Pikionis

The Parthenon stands on a hill, surrounded by the city of Athens. In 1954, Greek architect Dimitris Pikionis was assigned the landscaping of the archeological site surrounding the Parthenon. Pikionis believed in the idea of tradition as a way to combine contemporary architecture with nature (Mantziaras 1991: 101), and therefore sought to create archaic images, in the context of a modernising nation. Through a daily on-site process, he designed a stone carpet that weaves up the way to the Parthenon. This carpet fills an array of functions, such as pathway, orienting elements, rest areas and points of view. The surrounding vegetation is integrally part of the design, providing places of shade, emphasizing certain views and making use of endemic, attic plant species. In the details of the stone surface, one can observe many things. Recent marked concrete pieces lie next to fragments of demolished neo-classical buildings. Sometimes, formal compositions are created, representing the sun, a face or more abstract or spontaneous compositions. The whole intervention appears as a mixed use of fragments of the past, with materials that have a story of their own; with plant settings that recall ancient landscapes; with spiritual figures that suggest early religious times. All these fragments are woven together to form the new landscape of a nation that needed, at the time, to affirm its identity and origins.



FIGURE 2. Floor compositions in the landscaping of the Acropolis. (Source: H  l  ne Binet)

this approach; in these we can observe that the trace takes a more central place in the design. The Grande Cretto (Text Appendix 3 and Figure 3) is an extensive trace in itself, which covers 12 hectares. This importance in size helps the beholder to understand the gravity of the event: important event, important trace. The Topography of Terror (Text Appendix 4 and Figure 4) shows a differentiated treatment of traces. This procedure allows to figure several dimensions of the past in the same project: narratives of the seriousness of past events stand aside with narratives of its temporal remoteness and the changes occurred since.

The Concept of Trace

So what is a trace? It is a physical entity in the landscape; an imprint that makes a relation to a specific narrative of the place. To the observer, it reveals a former existence, process or action, caused by some agent or event. A footprint in the mud reveals a past act of walking; a burnt forest reveals a past fire. The narrative is encapsulated only partly in the embodying element, in a certain tension between the trace's evocative power and the user involvement it generates. The more explicit the trace, the more it attracts and impresses the beholder. In that sense the Grande Cretto constitutes a strong

visual character, which appeals to any person coming by. The more implicit the trace (the more mystery it keeps), the more it creates user involvement. The tiles of the Parc de Lancy belong here, as they are more mysterious than manifest; they involve the user's active questioning as part of the design. A trace is always located somewhere on this continuum between and explicit, and the designer decides of its position following the design intention.

If the narrative is weak or needs explicitation, it can be created or reinforced. This is what Descombes does in the Parc de Lancy. The narrative of the presence of the river in the landscape, and its fall into oblivion, is a rather abstract idea to translate in the landscape. That is why a supporting trace such as the tiles becomes relevant. As it appears, with something that tries to speak, people are brought to listen more carefully to the landscape and eventually, re-discover the river. In post-disaster landscapes, the narrative is usually strong, and the task lies rather in reaching it by revealing or creating traces. To do so, a certain of exploration is required, in order to find the elements in the landscape from which a performance of memory can emerge. Through such field studies combined with mapping, a map of site potentialities appears (Figure 5). From there the

APPENDIX 3. Grande Cretto ('Great Crack'), Gibellina Vecchia, Italy, 1984-2015, Alberto Burri

After the village of Gibellina was completely destroyed by an earthquake in 1968, Burri re-created the physical imprint of the former village. On a portion of approx. 300 by 400 metres, he brought back the space of the village's streets by raising some concrete blocks up to 1.70 metres where the former buildings used to stand. These blocks were filled with the rubble of the destroyed village. Thus the experience of walking in the streets of old Gibellina is brought back, but only partially, as one can still gaze right over the concrete blocks and embrace the ensemble. The beholder simultaneously sees the street, the former village and the surrounding landscape, creating relations between the three in a direct, visual way. The whole intervention forms a strong experience that mediates the past event to visitor, whilst facilitating an experience of the place which would not have been possible, had the ruins remained. Without explicating the desolation that reigned in the area, it forms a strong experience from which people can learn of this past.



FIGURE 3. Overview of the Grande Cretto. (Source: Gabriel Valentini)

APPENDIX 4. Topography of Terror, Berlin Germany, 2006-2010, Ursula Wilms (Heinle, Wischer & Partner), Heinz W. Hallmann

The Topography of Terror Foundation occupies the site of former Nazi Secret Police and Security offices. The new building is an archive centre; in the exterior design, two spatial entities co-habit. The building is surrounded by a field of grey, coarse gravel devoid of any vegetation. The resulting open space appears as disturbingly empty, provoking a feeling of seriousness that opens the way to questioning. This interrogation supports the visitor on his way to grasp what took place in this location. The ground is condemned to be continuously maintained in order to avoid any further growth, provoking a sort of continuous ritual of maintaining this memory. Next to this area, a wooded, overgrown area covers some historical remains, left to discover by the visitor, aided by information panels. To observe these, the visitor must venture visually into the mass of plants. As he observes, the narration of the past use of the place is combined to a narration of overgrowth, showing how the past events lie in the past, under later historical layers.



FIGURE 4. The open space in the Topography of terror. (Source: Anthony Hevron)

selection, and then creation or revealing, of traces can take place.

Potentialities

The use of traces allows us to overcome many incongruities posed by more classical approaches in memorial design. Where monuments tend to form autonomous compositions within a space (Debray 1999: 35), traces are intrinsically embedded in their context. They usually result from the modification of one single character of the landscape (the ground compressed into the form of a footpath, the burnt trees of the forest, the space kept open in the Topography of Terror). This leads to a stronger sense of ethics of place, lowering the risk of alienating the site.

Memorial constructions often seek to withstand any effect of time that would alter its appearance, typically making use of highly resistant materials (stone, concrete, metal) and maintaining vegetation to a highly geometrical, controlled state. Traces are naturally subject to these processes. The overgrown areas of the Topography of Terror welcome and celebrate this phenomena of evolution. This aspect makes the approach relevant in a contemporary practice of landscape architecture, where processes are acknowledged and celebrated. It also opens

the way to processes of forgetting, an essential part of memory (Ware 2008: 61), too long ignored by memorial design.

A third concern with the monument is its indirectness. Between the observer and what is referred to, the monument puts out metaphors and interpretations. Those devoid of the necessary background are left aside. The trace uses the much more direct canal of experience. In our era of short temporalities, the visual and the tactile - in general, the experience - prevail over the thought. We are bored by the substitute of the thing, we want the thing itself, or a fragment of it (Debray 1999: 41). The trace is exactly this fragment.

Working with traces is no nostalgic approach. It is about designing conditions which will shape the future, with the material of the past. Our time, characterised by a 'general state of environmental and cultural amnesia' (Girod 1999: 59), needs this. These anchor points provide us with reference points in our ever-faster transforming environment. They give us an idea of our environment's changeability. As all forms of memorial design, they allow us to reconstruct the past, and so to understand and learn from it. In his essay on the art of memory, Sébastien Marot writes that 'a reflexion on the art of memory

Islands in Landscape Architecture: Design, Abstractions and Metaphors

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transitions | analogy | design knowledge | comparative analysis

The term 'island' is used both in literal and figurative sense in daily language; similar to landscape architecture. The most common meaning of the word 'island' is land surrounded by water. Here we will analyse different ways of creation of islands from a viewpoint of planning and design. The research method is based on the principles of the case study approach. In the introduction we pay attention to the scope and character of islands in landscape architecture. In the second part a comparative analysis is made of case studies related to islands in different form and context, both newly designed islands and redesign of existing ones. The examples provide a first insight that illustrates scope and content of the subject. In the conclusions we will first of all give an overview that gives an impression of the rich and surprising insight into existing design knowledge on the subject. The overview shows design principles associated with the design of islands as physical entities, design by analogy and design of islands as metaphor. So, islands not only bridge the gap between literal & figurative but also between idea & material form.

Introduction

Islands are first of all natural phenomena but can also be man-made. The concept and idea has since historical times triggered the imagination, think of the story of Odysseus, Gauguin was inspired by Tahiti and many more (Law 2005; Lowenthal 2007). There is an online magazine 'The Island Review' dedicated to 'great writing and visual art that comes from, is inspired by, celebrates or seeks to understand the extraordinary appeal of islands, as places and as metaphors'. The concept of island also stands for isolation think of Napoleon exiled to Elba. Isolation in cultural sense is put forward by Glacken (1990) in which he states that islands tend to accelerate civilisation more than continents.

Islands – both as physical entities and in conceptual sense – are frequently used in landscape architectural projects. Jellicoe & Jellicoe (2006) describe and compare many examples of islands in the historical development of the discipline. In an earlier publication (Jellicoe & Jellicoe 1971) they investigated more specifically the phenomenon of water as a design material in landscape architecture, in which islands are part of. The paper is meant as a first investigation into the subject to gain more insight and eventually obtain an overview. We have chosen examples, both historical and contemporary, to be analysed on the design means at different levels of intervention; islands as objects, as part of landscape structure or not and at the strategic level. It will give a first insight into how islands are subject of planning and design.

'Island' is described in the Oxford Dictionary as: "(...) a piece of land surrounded by water". Size plays a key role in the definition; in geographical sense, Greenland is defined as the largest island. In the dictionary besides literal meanings there are also figurative meanings where only the analogy is crucial. The case study method forms the basis for the research approach. A predefined analytical framework is used in order to make the results of the analysis comparable. In the



FIGURE 1. Above the landscape plan for the Veerse Meer as part of the Deltaworks. The Veerse Meer is a newly created lake by damming a former branch of the river Scheldt between Walcheren, Noord Beveland and Zuid Beveland. The island 'Haringvreter' is one of the many islands created in the landscape plan. All islands are former mudflats in the highly dynamic river system so close to the sea; the design of these islands always starts with the contour of the existing mudflat but adds new forms to that. In the case of the 'Haringvreter' a new dimension is added to the form of the island by the planting of new forests. The edges around then get the shape of beaches around that are different from all sides. So the contour of the forest determines new natural processes without the tidal influences; nature is challenged to develop its own form by processes that cannot be overseen completely before. Design as a form of unexpected new forces, directed by the framework of the created contour of the forest. So, in the changing dynamics from tidal influence to water closed off the sea, the designers have created new conditions for landscape development by natural forces that are structured by the form of the planted forest. (Boekhorst et al. 1996; Topographic map from Maproom TUDelft)

analytical framework two key distinctions are used; levels of intervention and materialisation in the design means. Three levels of intervention are distinguished; materialisation of form, structuring use and access, strategy for the landscape development in the long run. In this paper the focus is on the materialisation of form; use of (design) materials and transitions.

A comparative Analysis of Islands in Landscape Architecture

Scope and Choice of Material

Based on a first analysis of references and fieldwork we include three aspects of islands in the analysis; literal/figurative, land/water, isolation/connection.

Originally we have analysed nine projects, from which we have chosen three cases for comparison in this paper. The choice is rather haphazard since there are so many examples and so much material on the subject can be found. Even in the context of landscape architecture the choice is a daunting task.

Comparative Analysis of Three Projects

- Haringvreter, Veerse Meer
The newly created island 'Haringvreter' is part of the landscape plan for the Veerse Meer, the first plan to be realised in the Deltaworks. It was designed by Nico de Jonge and Ellen Brandes (Landschapsarchitectuur 1985; Boekhorst et al., 1996). (Figure 1)
- Naviduct Krabbersgat Enkhuizen
A 'naviduct' is a navigable aqueduct that functions as viaduct for ships; it has also locks. Close to Enkhuizen the naviduct 'Krabbersgat' was constructed in the 'Houtribdijk'. The project also comprises of a dredge reservoir south of the naviduct. (Figure 2)

- Urban heat islands
An urban heat island is a part of the city or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. Urban heat islands can also be seen as representation of an urban system in which heat production is a characteristic. The Millenáris Park in Budapest was a contribution to the improvement of the urban microclimate at large by allowing cool winds from the mountains to reach the city centre by a narrow valley in which the park is located. (Figures 3 & 4)

2.3 Results of the Comparative Analysis

Three main categories can be distinguished from the cases we have seen.

- Planning and design of islands as physical entities:
Design of islands as objects in the landscape; redesign existing islands or design of totally new ones.
- 'Island' as design concept; design by analogy:
In the use of 'island' as design concept, analogy forms the basis for a conceptual comparison between 'island' and the plan. 'Analogy' in the Oxford dictionary is referred to as: "(...) A comparison between one thing and another, typically for the purpose of explanation or clarification". In most cases the correspondence is only partial; in design it can be formal, structural or a strategic idea.
- 'Island' as metaphor; design in search of meaning:
In some cases 'island' has been used as a metaphor. The Oxford Dictionary describes 'metaphor' as "(...) figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable". Even though the Oxford puts an emphasis on use of metaphor in literal sense, in design context the metaphor is used as a mental phenomenon (Jaeger 2005). The link between language and



FIGURE 2. The naviduct 'Krabbersgat' is located south of the city of Enkhuizen and not really an island in the real sense but part of the dike between Enkhuizen and Lelystad.

It is a solution for traffic crossing between ships and cars; no bridges are needed anymore and both flows can continue independently without being interrupted. The naviduct is combined with a dredge reservoir which is needed for the construction of the artificial island in the dike and at the same time serves as protection of the locks against (western) storms and ice in winter. The dredge reservoir will gradually transform into a nature reserve under influence of water movements and vegetation development.

The view from the car is magnificent because from the dike you experience the wide open space of the water. Just before getting into the tunnel, the ships can be seen passing by in the lock at the same level; very Dutch. This complex is the first of its kind and the plan making involved intensive research and experimentation since there have been no precedents for this type of plans. The landscape plan for the whole complex was designed by Lodewijk Baljon Landscape architects in close collaboration with the engineers of Rijkswaterstaat (Harsema et al., 1998; Topographic map from Maproom TUDelft)

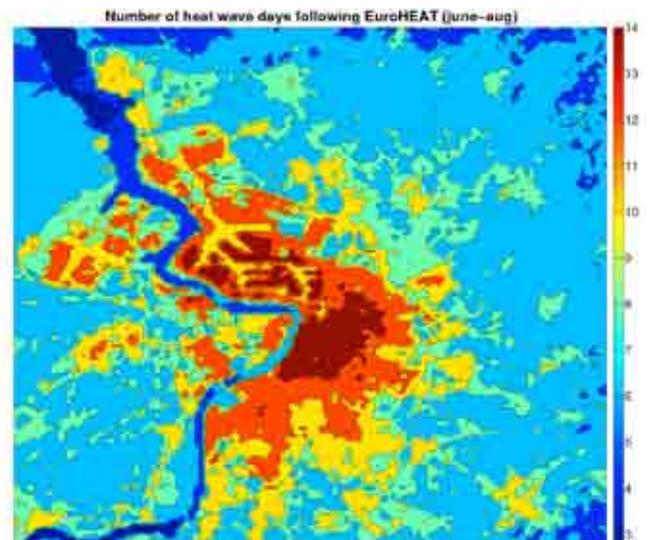
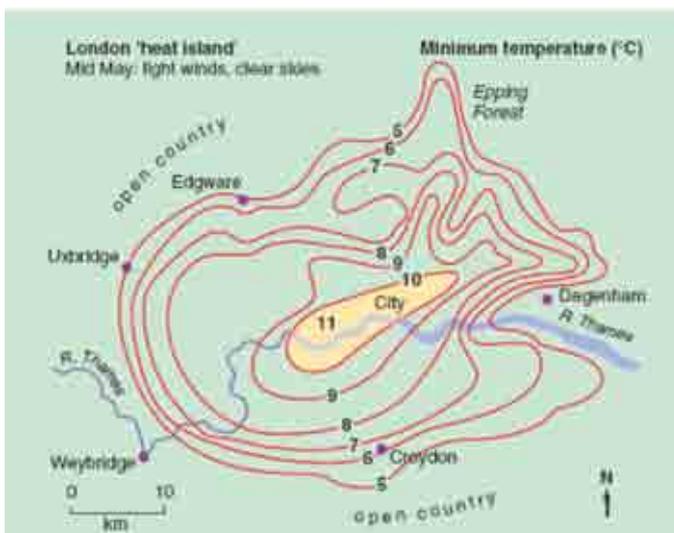


FIGURE 3. Urban heat island of London (image on the left)

In London the urban heat island shows how the city and the area west of the city along the river Thames are the hottest. On the left bank, in the northeast, the influence of Epping Forest is clearly visible. Epping Forest is a large forest of more than 2000 ha in a linear form. The pattern shows how such a forest can form a linear space of lower temperatures. In this case the linearity is caused by the linear form of Epping Forest. The London parks close to the city also seem to have an influence; Hyde Park, Green Park and St. James Park, the three are more or less connected. On the other hand the far larger Richmond Park on the right bank does not seem to influence the graph (Wilby 2003).

Temperatures in Budapest after heat wave days (image on the right)

The situation in Budapest expressed in the temperatures after heat wave days in the summer. The river Danube marks the difference between the Buda side (right bank) and the Pest side (left bank); the Pest side is much warmer than the Buda side. This partly due to the topography, Buda is for a large part at higher elevations but the main difference is in the traffic intensity. There is far more traffic on the Pest side and more people are living there. It is not entirely clear where the yellow patterns in the red and even dark red – especially on the left bank in the north – come from.

imagery in developing a design concept towards a realised plan. In the distinction between function, use and meaning, the metaphor can be used to emphasise the relation between idea and material form (Watson 1984; Buchanan 1990).



FIGURE 4. The Millenáris Park (Bardóczy et al. 2011)
 The park is a privately run park on the former industrial site of the Ganz Tram Company designed by Újirány Landscape architects around the millennium. The plan for the Millenáris Park is not only a reconstruction of a brownfield in the midst of a new commercial centre but one of the ideas behind the plan is also to enable fresh air from the mountains to reach the city centre. In fact an effort to influence the micro climate of the city of Budapest. The top image is the plan in headlines with its central axis that organises the different activities, spaces and buildings. The linear direction of the plan area is directed to the river Danube which functions as a central 'artery' for fresh air. On the left the park as green space in the urban landscape, on the right the image from the satellite. Apart from the function as green space in the urban landscape of the Buda side, the park also functions as a corridor for fresh winds coming from the mountains, thus influencing the micro climate.



islands, physical, analogy, metaphor	planning and design of physical islands	the island as analogy	the island as metaphor
rural landscape	<i>Haringvreter</i>	-	-
urban landscape	**	-	urban heat islands
infralandscape	-	naviduct Enkhuizen	-

FIGURE 5. Overview of conclusions
 First of all the planning and design of islands as physical phenomena. The classic definition of 'island' is essential; land surrounded by water. One of the key issues in design is the materialisation of transitions between land and water. Design principles used are contrast, rhythm.
 Haringvreter
 Secondly we have seen examples where 'island' is used as analogy. The core of the idea is a defined contour that creates a transition between interior and exterior. So the designed object or phenomenon is defined by a contour but this contour is not necessarily the distinction between land and water.
 Naviduct Enkhuizen
 The last category is the use of 'island' as metaphor. In this case 'island' is used as a mental construct, a conceptual tool in which not only functional and formal issues play a role but also experience, meaning, narration. It refers to 'reading the landscape' based on different 'narratives'.
 Urban heat islands

Conclusions

In the case studies and publications we have seen three main categories of the use of 'island' in design context; islands as physical phenomena, as a result of design by analogy and as metaphors in different landscape types. (Figure 5)

References

- Bardóczi, S. & K.M. Szilágyi & Z. Nemes & T. Sándor & G. Szloszjár, 2011. 2010: Landscape odyssey – Selections of the most significant works of Hungarian landscape architecture 2000-2010. Budapest, HCA Landscape Architecture Division, 2011.
- Boekhorst, J. te & P. Deroose & H. Harsema & V. Illés & N. de Jonge, 1996. Het fenomeen delta – landschap van Nico de Jonge / the phenomenon delta – a Nico de Jonge landscape. Wageningen, Blauwdruk.
- Buchanan, R., 1990. Metaphors, narratives, and fables in new design thinking. *Design Issues* 7 - 1, 78-82.
- Glacken, C.J., 1990. *Traces on the Rhodian shore – Nature and culture in Western Thought from Ancient times to the end of the eighteenth century.* Berkeley, UCB Press, 5th pr.
- Harsema, H. & Sj. Cusveller & R. Bijhouwer & P. van Bolhuis & N. van Keulen & F. Meyer (red.), 1998. *Landschapsarchitectuur en stedebouw in Nederland 95–97 – Landscape architecture and town planning in the Netherlands 95 – 97.* Bussum, Thoth.
- Jaeger, Th.A., 2005. The metaphor, the dichotomy and the narrative. in: *making*, 2005. 8 p.
- Jellicoe, G. & S. Jellicoe, 1971. *Water – The use of water in landscape architecture.* London, Adam & Charles Black.
- Jellicoe, G. & S. Jellicoe, 2006. *The landscape of man – Shaping the environment from prehistory to the present.* London, Thames and Hudson, reprint.
- Landschapsarchitectuur, 1985. *Landschapsarchitectuur – Tentoonstelling van Staatsbosbeheer – Landschapsbouw.* Utrecht, Staatsbosbeheer - Landschapsbouw.
- Law, A., 2005. Of navies and navels: Britain as a mental island. *Geografiska Annaler* 87 - 4, 267-277.
- Lowenthal, D., 2007. Islands, lovers, and others. *The Geographical Review* 97 - 2, 202-229.
- Watson, D., 1984. Model, metaphor and paradigm. *Journal of Architectural Education* 37 - 3/4, 4-9.
- Wilby, R.L., 2003. Past and projected trends in London's urban heat island. *Weather* 58-2exportedGraphic.pdf.

Process and Product: The “Renaturalization” of the River Aire

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process versus product | Georges Descombes | river renaturalization

Over the last two decades, the argument for landscape design centered on natural processes has sharply increased, relegating landscape design as a formal product to a secondary status. While reasonable at a conceptual level, this approach does not acknowledge that at any given moment any process yields a product – and it is the product that we perceive, consider, and use. Rather than a question of either/or, why not an approach based by both/and, that is to say, both process and product? Among the most significant recent “products” shaped by “process” is the design for the “renaturalization” of Geneva’s River Aire by the team SUPERPOSITIONS, with Georges Descombes and the Geneva-based practice ADR as the primary designers.

Over the last two decades, the argument for landscape architecture based on natural processes has sharply increased. As a consequence, for many landscape architects any involvement with the designed landscape as a formal product has been severely diminished. Practitioners, primarily those academically based, argue that landscapes are dynamic and prone to continual change, and we must therefore approach their design as the management of processes rather than the creation of an artifact. At a conceptual level this approach makes considerable sense, but it neglects the basic fact that at any given moment processes engender products – and it is just those products which we perceive, consider, and use.

A revealing article in the *Journal of Landscape Architecture* described what had transpired since first prize in the 2000 competition for Downsview Park (outside Toronto, Canada) was awarded to the life-style designer Bruce Mau working in collaboration with Rem Koolhaas/OMA and a team of consultants.¹ In their entry, “Tree City” – actually less a plan capable of implementation than a vague graphic diagram – the designers argued for process and tree growth as the basis of the scheme. Their compelling diagrams assigned each of the circles, or sets of circles, to purposes such as a corporate or cultural campus, theater, gardens; some were just planted as groves of trees.² Beyond function, few aspects of the plan were specific.

In her article Alissa North described how the competition diagram could not be enacted without changing its intentions. Koolhaas/OMA quit the project soon after the competition results were announced; Mau left the project a few years later. In response several Canadian landscape firms were commissioned to produce detailed plans for the areas of the park to be constructed during the first phase of work. The purity of the diagram – and only diagrams can retain purity – dissolved



FIGURE 2. SUPERPOSITIONS, (Georges Descombes, ADR et al), L'Aire, Geneva, Switzerland, 2001–2016. The design featured extensive plantings of both indigenous and imported species. (Marc Treib, August 2012)

FIGURE 1. SUPERPOSITIONS, (Georges Descombes, ADR et al), L'Aire, Geneva, Switzerland, 2001–2016. Among the elements of the canal that were retained were stands of the poplars lining its banks. (Marc Treib, August 2012)

during realization. In one of the article's sub-headings Ms. North bemoaned that the wonderful description of process key to the winning entry had been lost to specific forms. Her plaint made me consider just why everyone now seems to consider process as the proper, and perhaps even the only, way to make landscapes, as opposed to actually designing the landscape.

The idea that the right process produces a worthy landscape seems to return once again, to ideas set forth by Ian McHarg in the late 1960s.³ At least in part McHarg's analytical process abrogated the responsibility for creating vital places, his writings implying that the correct process would always yield the ideal landscape. The few identifiable landscapes produced by his firm – the Woodlands in Texas, for example – have been experientially undistinguished.⁴ Also lacking from such thinking was an appreciation of the human dimension, regarding it as essentially negative. If many – but certainly not all – designed landscapes involve human occupation, what place do people have in the considerations of the designer? Obvious in the Downsview project descriptions was a general focus on the remediation of a despoiled landscape rather than on a park as a social site.

Perhaps most of all, approaches rooted only in process rarely consider that at any given moment, a process results in a product, and it is the latter we experience. Or let us say, we may sense the process only through the product. By simple logic then, we should always consider the product that results from any process. If a field of wildflowers attractive briefly in spring becomes a scrubby and unattractive place the remainder of the year, perhaps the design is not ideal for recreation, picnics, or even as bird habitat. A true process, then, should consider all the dimensions of landscape design rather than only those natural. This requires an acknowledgement of the formal, cultural, and historical dimensions of nature and construction as well as the dynamic natural processes that shape both.

Rather than a question of “either/or” – either process or product – why not an approach that is “both/and,” that is to say, thinking that enfolds both process and product? Among the most significant recent “products” shaped by “process” is the design for the “renaturalization” of Geneva's River Aire by the team SUPERPOSITIONS, with Georges Descombes and the Geneva-based practice ADR as the project's primary designers.⁵



FIGURE 3. SUPERPOSITIONS, (Georges Descombes, ADR et al.), L'Aire, Geneva, Switzerland, 2001–2016. Earthen lozenges were excavated from the river bed, to erode over time as vegetation takes hold. (Courtesy SUPERPOSITIONS, 16 March 2015)

The River Aire was converted to a canal in the 1920s as a vehicle for flood control, but almost fifteen years ago a governmental decision proposed “renaturalizing” the river to address current environmental concerns, flooding among them. Most entries to the invited design competition eradicated all vestiges of the canal and attempted to configure a waterway that would meet traditional aesthetic visions of a natural river.⁶ In contrast, the SUPERPOSITIONS’s design argued that being a cultural landscape, the canal – and therefore any future river derived from it – should be considered as a hybrid of culture and nature (Figure 1). To manage floods and water pollution the new design must acknowledge that the physical situation of the river valley had completely changed since the times of both the original river and the construction of the canal. Therefore, a complete renaturalization was a romantic impossibility.

The resulting scheme, almost ten kilometers in length and completed to a large degree in 2016, addresses ecological and riverine processes, as well recreation and vehicular and pedestrian circulation. Its comprehensive design balances scientific understanding with an aesthetic shaped by natural processes, using terraces, bridges, and sluices to “stiffen” the banks of the river and modulate the rhythm of its flow: what Descombes has described as “fluid morphology.”⁷ The team’s efforts aimed at diminishing inundation and water velocity at flood stage with a design based on rigorous scientific study

and review. Accompanying architectural construction and new vegetation, reshaping topography became the primary medium for providing alternative paths and allowing the river itself to make the ultimate decisions about where to flow. Extensive plantings strengthened indigenous vegetation, augmented by new species intended to curb water movement, stabilize the land, and add animal habitat and beauty (Figure 2). Using the river as “co-designer” – as Descombes phrased it – the revived, if not completely natural-looking, Aire represents a landmark in the reformation of riverine landscapes.⁸

Georges Descombes has described the project as a series of gardens, with the overall linear design interweaving three currents: water moving through the river’s channel, visitor circulation and recreation along and across the banks, and vehicular movement transversely and laterally. While the management of water velocity relies to large degree on topographic actions such as widening and diverting the main channel into alternate threads, or deepening pits as the bases of level changes, considerable invention was demanded to support the prosperity of the vegetation. The most clever of these devices were the lozenges, shaped from the river bed and aimed against the direction of flow, that divide the advancing liquid sheet into narrower, less destructive streams (Figure 3). Descombes humorously claims that this eloquent device was inspired by testing, by pouring milk over the micro-buttes of



FIGURE 4. SUPERPOSITIONS, (Georges Descombes, ADR et al), L'Aire, Geneva, Switzerland, 2001–2016. Steps and other architectural interventions support use and invite visitors to the river. (Marc Treib, August 2012)

a chocolate bar.⁹ The lozenges are only a temporary measure, however; formed of unreinforced earth they will erode under the force of high and fast water. While beautiful forms at the time of their making, they mark the process of erosion and growth until they ultimately disappear under a blanket of mixed-species vegetation. To support human use, the SUPERPOSITIONS team has stiffened the bank in places with simply yet elegantly detailed concrete steps that invite visitors to approach (and perhaps even enter) the water; these constructions also proclaim that the entire project is artifice, a human construction (Figure 4).

In a short paper, it is only possible to suggest the depth of the thinking that lies behind an effort that has extended over more than a decade. It was not determined in an instant as a master plan, but conceived and implemented in phases as time, funds, and governmental and scientific review allowed. It began as a strategy – a process – and a design that, like a theatrical play or musical performance, would be interpreted and enacted over time, as the resolution of each of the “gardens” and the architectural insertions along its length. Each was broadly traced in the first scheme and designed with greater thought and detail as each segment of the river landscape was developed and built. While continued variation marks the design, the river itself and the environmental forces related to it, shape the “renaturalized” River Aire. The new river is not a natural product, it is a human construct that has interwoven intellect and talent with natural forces and materials. These factors have conspired in creating an instructive and experientially rich landscape in a state of constant evolution – but an evolution within a framework established through design. The SUPERPOSITIONS’s design for the Aire demonstrates that processes must not neglect a consideration of the products that will result – nor the people who will use them, and that any

consideration of the product must not neglect the processes which shape it. The very best landscape designs accomplish both.

References

1. Alissa North, “Processing Downsview Park: transforming a theoretical diagram to master plan and construction reality, *Journal of Landscape Architecture*, Spring 2012, pp. 8–19.
2. Julia Czerniak, ed., *Downsview Park Toronto*, Munich, Prestel, 2001.
3. In writings and in film, Ian McHarg expounded on his ideas about the folly of human planning and the need for design by analysis. See *Design with Nature*, Garden City NY: Doubleday, 1969.
4. For a chronicle of The Woodlands project (designed by Wallace, McHarg, Roberts, & Todd), see Bo Yang, Ming-Han Li, & Chang-Shan Huang, “Ian McHarg’s Ecological Planning in the Woodlands, Texas: Lessons Learned after Four Decades, *Landscape Research*, October 2015, pp. 773–794.
5. For greater documentation and images of the project see the website superpositions.ch.
6. The failure of cultural and aesthetic norms to triumph over hydraulic process is discussed in Kristen Podolak and G. Mathias Kondolf, “The Line of Beauty in River Design: Hogarth’s Aesthetic Theory on Capability Brown’s Eighteenth-Century River Design and Twentieth-Century River Restoration Design, *Landscape Research*, January 2016, pp. 149–167.
7. Email, Georges Descombes to Marc Treib, 29 March 2016.
8. Georges Descombes, conversation with Marc Treib, 22 June 2014, Geneva.
9. Descombes described this process in a keynote talk at the annual meeting of ECLAS held in Sheffield, England, 8 September 2011.

Making Meaning: Minds, Bodies and Media in Design Education

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embodied knowledges | situated knowledges | studio education | media

Education is a practice of futurity. It seeks to prepare the minds and bodies that will construct and inhabit the future. The educational experience that most people receive, however, is one that is designed to prepare them for present roles rather than future challenges. Creativity, criticality, and imagination are crucial not just to students of art, design, and the humanities, but to all students in all disciplines. This essay examines the use of the imagination in the design process and how it may be employed to posit better future worlds despite the prevalence of neoliberal imaginaries. Employing the senses to bring the site and its materials alive in the embodied imagination is key to envisioning scenarios for whole ecological and emotional worlds to design for dwelling.

The processes of design have much in common with the processes of imaginative play. They both require the envisioning and rehearsal of scenarios, and they are both often utopian. Utopias are ways of analysing and evaluating situations through narratives that allow us to test possible worlds. They can be used as methods both to imagine better (not necessarily perfect) worlds or they can be used to picture what might happen if things go wrong. Meet utopia's evil twin, dystopia. Sometimes our heart's desires don't lead to healthy choices, and working through utopian scenarios is a way to figure out which of our desires may feasibly be fulfilled (which moves them from the realm of the utopian to the attainable), and to what extent. The limits of fulfilment under capitalism and its attendant structural inequalities can, in many ways, only be tested first as utopian scenarios. Both design and imaginative play also allow us to test potentially dangerous scenarios without endangering actual subjects in real life experiments. The experiment I want to undertake here, though, is daring but not a dangerous one, rather it is a potentially enriching one. I want to dare to imagine a world where people live lives characterised by ease, pleasure, and sensuality and in which everyone has enough to satisfy both their basic needs and a generous selection of superfluous desires. This world is one that must be imagined in detail. This prefigurative work is an act of make-believe. Ruth Levitas refers to the "imaginary reconstitution of society", (2013: xi) but this goes beyond to the imaginary reconstitution of the spaces in which society exists as well. Make-believe is a practice that has agency. Our dream-worlds and our life-worlds are constantly interacting to shape place and dwelling. Using utopian imagination as method, then, for enacting positive change in the built and lived landscape is the only way to ensure that our future world provides adequate pleasure to support the good life for all. This paper will examine the roles designers play in humankind's futurity – as makers, envisioners, and tastemakers

– in light of contingent and relational models rather than simplifying, teleological, and diagrammatic models of utopian method. Further, the creation of more fulfilling and sustainable places to live requires the reshaping of popular beliefs to change patterns of everyday life and consumption. This paper specifically addresses the persuasive, propagandistic nature of representation for design and asks that designers concentrate on using their powers for good.

Naturally, none of this can happen without education, and education is a practice of futurity. It seeks to prepare the minds and bodies that will construct and inhabit the future. The educational experience that most people receive, however, is one that is designed to prepare them for present roles rather than future challenges. Creativity, criticality, and imagination are crucial not just to students of art, design, and the humanities, but to all students in all disciplines, thus I hope that this essay may awaken the desire to use utopia as method with teachers outside the architectures¹ as well.

In both education and professional practice, design processes are currently being reenvisioned in ways that are analogous to natural processes and ecologies. This makes sense if we are to design, make, and build in responsively cohesive ways. Envisioning design as a conversation with sites, materials, processes, habitats and habits and so on engenders the according of agency to places and all they are made of. The increasing interpenetration of social, cultural, and physical worlds with new media ecologies further underscores the importance of envisioning these processes differently.

Design involves drawing, making, modelling, and simulating. Simulation, in particular, as an imaginative activity, can be immensely rich if we are simulating the right things. It takes place in the brain (and the mind) during the design process, and the designer rehearses movements and activities in space during simulations using the same neural pathways that they would if they were physically negotiating and interacting with an actual site. In this way we use the mind's body rather than the mind's eye. These simulations needfully mimic not just spaces, forms, objects, and buildings, but situations, sensations, emotions, and interactions. "*Modes of attending to scenes and events spawn socialities, identities, dream worlds, bodily states and public feelings of all kinds,*" writes Kathleen Stewart (2007: 10).

The imaginative 'play' that we call design has a special space – the studio. It is a physical space that is particular to the act of design. Like the theatre, the stadium, or the pitch, it has a particular construction that marks the space out for a particular role. Like 'once upon a time' and the set-ups it elaborates, the studio is a physical space that corresponds to a specific space of the imagination. While, as with other species, play can take place anywhere, there is still a particular role for this special place, which is the setting for a ritual that triggers the flow of creativity. When entering the studio this frame of mind takes over, and any interruption to the atmosphere can be catastrophic – or at least it feels catastrophic. It is certainly detrimental to the creative design process.

The imaginative work that takes place in the studio is part of a larger process of co-making, co-working, co-imagining. The musician Brian Eno calls this 'scenius', and it is a helpful concept, as it reminds us that even for the seemingly solitary 'genius' painting or writing poetry in a garret, that invention emerges from a shared background of teaching, conversation, making, exploring, and feeling together: an "ecology of talent" (Eno 2016). It posits a play-space / design space of situated, mediate, and intercorporeal social connectedness.

For landscape architecture the awareness of a 'scene' must include not only those people involved in co-invention, but they must enter into a constructive dialogue with all the processes and forces that comprise a landscape: biological, geological, climatic, cultural, social. The landscape architect needs to employ a mode of thinking and acting that Lorraine Code calls 'ecological thinking'. I prefer a term I've borrowed from ethnology, and this is 'toposophy' – thinking that is about place, grounded in place, not just about objects, but about vast arrays of intersecting and interdependent processes and forces. Unlike philosophy – 'beautiful thinking' – it is thinking that is always about somewhere. The term 'ecological thinking,' useful as it is, seems to direct us too much towards preconceptions of the natural world, while toposophy engages both nature and artifice. Toposophy is a perspective, allied to what Tim Ingold calls the dwelling perspective, which treats people as organisms immersed in their lifeworlds, as opposed to what he calls the building perspective, which supposes that "people inhabit a world – of culture or society – to which form and meaning have already been attached." This posits that the individual must 'construct' their world in order to act on it, rather than being, from birth, a co-actant with the landscape in which they dwell. (2000, 153) Making a scene helps us to connect with past realities rather than achieving a total unlearning – we instead unlearn selectively, with help, and with each other, holding on to those fragments of utopia that already exist and must be kept. "*Thinking means venturing beyond. But in such a way that what already exists is not kept under or skated over.*" (Bloch 1986: 4)

It is through imaginative renderings of possible future worlds that we have the ability, as designers and envisioners, to influence structures of both belief and desire to positive and ethical ends. Worlds that we know to be physically and morally possible, but which have been suppressed by ideologies of selfish cynicism, fatalism, and nihilism, hidden behind a smokescreen of agnotology, can be forced to re-emerge. The 'future as a cultural fact' remains true, but its alethic valence has shifted from the negative to the positive, from the dystopian to the utopian. Truth has become the province of hope, not the grounds for the abandonment of desire and fulfilment.

Hope involves desire, imagination, and belief, all three, and design insists on the addition of supposing as another attribute. First, we must simultaneously suppose and believe that hope is possible at all, and once that possibility is admitted, then the belief in a better future undergirds and impels the processes of aspiration and envisioning that are germane to design, but which can be led astray by cynical or fatalist attitudes, and/or by greed and hubris. Hope also requires a collective effort – a scene – rather than a reliance on the emergence of a new and charismatic leader:

The whole edifice of critical thought is in need of reconstruction. This work of reconstruction cannot be done, as some have thought in the past, by a single great intellectual, a master thinker endowed only with the resources of his singular thought, or by the authorized spokesperson for a group or an institution presumed to speak in the name of those without voice, union, party, and so on. This is where the collective intellectual can play its irreplaceable [p43] role, by helping to create the social conditions for the collective production of realist utopias. (Bourdieu 2000: 42-3)

As Jeremy Gilbert notes, “*This is a very important issue for any attempt to think about the nature of democracy, because the assumption that agency, creativity and rationality are qualities which pertain to individuals but not to groups poses severe problems for any attempt to base a politics on the possibility of collective decision making.*” (2014,; 33) It almost goes without saying that contemporary higher education everywhere is subject to ideological forces which are pulling precisely in the opposite way from that which I describe as necessary. I would hope, though, that far from seeming pie in the sky, that my approach shows just how disconnected from problems of education, sustainability, and citizenship that government everywhere and, thus, management in higher education has become. As a result of the marketisation of educational institutions, higher education now mirrors the construction of society outside the ivory tower: “*freedom is reduced to a market strategy and citizenship is narrowed to the demands of consumerism. The upshot is that it has become easier to imagine the end of the world than the end of capitalism.*” (Giroux 2007: 25)

When designers work with communities to remodel their buildings and landscapes to provide for better futures, they should work, through processes of supposing and scenario-making with those communities to find out how they can make more and better – more special – what they already are. Design in the architectures is a process of becoming that addresses being and longing – belonging – to clear and prepare a space for play, for a shared imagining of the future and a striving towards it, that builds upon *scenius* and *toposophy* for creation that, through make-believe, makes belief in a better world possible.

Annotation

1. I refer to architectures in the plural because it gives more equal weighting to fields which are complementary to, but not subservient to or subsets of architecture, including planning, landscape architecture, urban design, interior architecture, theatrical set design, and so on. ‘Architectures’ is a term which, like ‘knowledges’, resists totalizing and hierarchical tendencies and values both diversity in the present and the possibility of the emergence of other allied yet distinctive fields in the future.

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References

- Bachelard, Gaston. Trans. by Jolas, Maria. *The Poetics of Space*. Boston: Beacon Press, 1958, 1964.
- Bourdieu, Pierre. "For a Scholarship of Commitment" in *Profession*, 2000; 40-45.
- Carruthers, Peter. "Why Pretend?" Nichols, Shaun, Ed. *The Architecture of the Imagination: New Essays on Pretence, Possibility, and Fiction*. Oxford: Oxford University Press, 2006, 89-109.
- Catlow, Ruth, and Tim Waterman, 2015. "Situating the Digital Commons: A Conversation Between Tim Waterman and Ruth Catlow." Furtherfield, accessed 25 May 2016. <<http://www.furtherfield.org/features/interviews/situating-digital-commons-conversation-between-ruth-catlow-and-tim-waterman>>
- Code, Lorraine. *Ecological Thinking: The Politics of Epistemic Location*. Oxford and New York: Oxford University Press, 2006.
- Cresswell, Tim. *In Place/Out of Place: Geography, Ideology, and Transgression*. Minneapolis and London: University of Minnesota Press, 1996.
- Curtis, Neal. *Idiotism: Capitalism and the Privatisation of Life*. London: Pluto Press, 2013.
- Dissanayake, Ellen. *Homo Aestheticus: Where Art Comes From and Why*. New York: The Free Press, 1992.
- Eno, Brian. "Scenius". P2P Foundation website, accessed 30 April 2016. <<http://p2pfoundation.net/Scenius>>
- Gilbert, Jeremy. *Common Ground: Democracy and Collectivity in an Age of Individualism*. London: Pluto Press, 2014.
- Giroux, Henry A. "Utopian Thinking in Dangerous Times: Critical Pedagogy and the Project of Educated Hope." in Coté, Mark, Richard J.F. Day, and Greig de Peuter, eds. *Utopian Pedagogy: Radical Experiments Against Neoliberal Globalization*. Toronto: University of Toronto Press, 2007, 25-42.
- Halpin, David. *Hope and Education: The Role of the Utopian Imagination*. London and New York: RoutledgeFalmer, 2003.
- Ingold, Tim. *The Perception of the Environment*. London and New York: Routledge, 2000.
- Johnson, Mark. *The Meaning of the Body: Aesthetics of Human Understanding*. Chicago and London: University of Chicago Press, 2007.
- Lakoff, George. *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago and London: The University of Chicago Press, 1987.
- Lakoff, George & Mark Johnson. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books, 1999.
- Leski, Kyna. *The Storm of Creativity*. Cambridge, MA: MIT Press, 2015.
- Levitas, Ruth. *Utopia as Method: The Imaginary Reconstitution of Society*. Basingstoke and New York: Palgrave Macmillan, 2013.
- Nichols, Shaun and Stephen Stich. "A Cognitive Theory of Pretense", *Cognition*, 74, 2000, 115-47.
- Pérez, Santiago R. "Towards an Ecology of Making" in Borden, Gail Peter, and Michael Meredith, Eds. *Matter: Material Processes in Architectural Education*. Abingdon and New York: Routledge, 2012, pp 379-395.
- Sargisson, Lucy. *Fool's Gold? Utopianism in the Twenty-First Century*. Basingstoke and New York: Palgrave Macmillan, 2012.
- Stewart, Kathleen. *Ordinary Affects*. Durham & London: Duke University Press, 2007.

Interdisciplinary Approach to Common Urban Landscape. Theory and Teaching Practice.

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common goods | wicked problems |
open design | urban sociology

In recent years we can observe the new paradigm shift from a mechanical to holistic (ecological) approach. It is crucial especially for public spaces, to function as a common good for urban inhabitants. For these type of places, one of the most important values is a process of bottom-up creation, led by local communities. It is a guarantee of the identity and specificity of the landscape. The authors (a landscape architect and an urban-sociologist) want to describe a need for the strongly combined, interdisciplinary approach in urban research, design and management based on the example of Jazdów Finnish Houses Estate in Warsaw.

Introduction: Cultural Landscape Protection

A “cultural landscape” is a diverse system, which consist of material, social and intangible layers. It is a reflection of long-term relations between man and environment (Bernat 2011: 11), a source of values and meanings. In recent years more and more attention is paid to emphasize the identity and uniqueness of landscape by protecting its intangible values (UNESCO Convention 2003). Consequently, the identity of the landscape is associated with the community and the process of inhabitation (Gawryszewska 2013). Inhabitants shape their surroundings by a creative process to build places that are parts of the cultural landscape (Hoteit 2015: 2). However, identification of creative, bottom-up processes as a value of the place, seems to be still underappreciated by authorities, urbanists and designers.

With the change in policies for the cultural landscape protection values, there is a theoretical and methodological shift toward a more receptive design approach. Over the past few decades many researchers boldly accentuate the paradigm change from mechanical to holistic (or ecological). They identify the coming of a new order which, depending on an author means: ‘political ecology’ (Latour 2010) or ‘eco legal order’ (Mattei 2015). According to researchers it would need providing local community with new, stronger rights to better decide (Mies 2001) the realisation of the development with respect of a whole economical-environmental ecosystem rules (Latour 2010) with sensitive and open approach to design (Prominski 2005). What is more the ecological paradigm means its inseparable connection between layers through placemaking and bottom-up activities (Figure 1). All layers should be treated as a complete system and a common good.

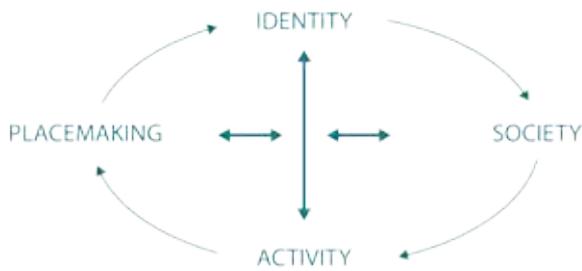


FIGURE 1. The relationship between a society, the process of creation and the identity of a place.



FIGURE 2. Jazdów Finnish Houses Estate. View on the community garden, 2015, Anna Wilczyńska

One of the most significant implications of the paradigm is ANT theory (Latour 2010) that describes a social world as represented by two kinds of actors: the human (Man) and non-human (not only animals and plants, but also culture, values, information etc.). Both are connected through relations, and all actors and relations create networks, which are in the constant process of change.

In this article the authors describe how paradigm change is transferred into urban democracy in design and management practice. The starting point for research was the observation of relations between the actors. In urban context a critical point where relations are the most visible is the interweaving of various spheres (ex. territorial, social, spatial) highlighted by the event or the conflict that is focusing energy of the elements, revealing their preferences. That is why Jazdów Finnish Settlement in Warsaw has been chosen as a case study for both authors.

Jazdów Finnish Houses Settlement as a Common Place

Jazdów is located in the city centre near Warsaw Escarpment. In the XIIth century this area became the seat of the dukes and the kings of this district. In 1809 an army hospital was built in there. It was functioning as an important centre of conspiracy. Nowadays Jazdów is a green place with loose housing development of small Finnish houses that were brought from Finland to USSR and then, as a gift from Russia to Poland. They were constructed in 1945 for the employees of Warsaw Reconstruction Bureau and their families who have created a living memory of a destroyed city, passing it from generation to generation.

Because of the development pressure, a part of the settlement has been designated to be demolished. When the municipal government decided to do so, this decision met a huge opposition of the inhabitants, NGOs and the community activists. They requested public consultations that were actually carried out in here. Today many NGOs “took over” vacant houses and have created community centres or gardens (Figure 2). Jazdów is functioning as creative and open place for everybody and it can be definitely considered as an urban common. However, it is still a more informal than formal

solution. The government has agreed to let the Finnish houses to be treated as cultural and social centres, but there is still lack of the legal vision for its spatial and managerial development.

Interactive Approach to Research and Design

Taking account of the formation of places such as Jazdów, there is need for a new practical approach. To begin with, social, economic, cultural and spatial diversity of Jazdów shows that there is a demand for interdisciplinary approach in reference to common goods. The old, top-down methods of protection and design (such as competitions) are not enough at the moment. When taking into account various processes of creation as a value we need a more open, proactive type of design and management.

First, the authors recognised dilemmas of Jazdów during the process of public consultation. This phase revealed the basic needs and thoughts of the local community. The next step is a continuous process which constantly works in changes, this phase is consistent with another method and theory called “wicked problems” (Rittel, Webber 1973; Conklin 2005), which is where unexpected developments are an integrated part of each design stage, and where a designer should be open at all times to modify steps and answering new, emerging questions. A similar, but a more practical dimension is the theory “open design” (Prominski 2005) allowing users to develop their surroundings every day of the creation. This process happens often already in abandoned and forgotten areas where residents themselves are creating their places.

Now an interdisciplinary team assembled in ‘Partnership for Open Jazdów’ is working on current problems and a future model of design and management for the settlement. There were many different workshops carried out together with local and foreign participants (e.g. from Finland) and further ones are planned. For the authors, the crucial point is to establish experimental projects with students and tutors from different fields (like sociology, architecture, IT, philosophy, anthropology, and urbanism).



FIGURE 3. The integration of creative bottom-up processes into management and design methods of working.

Summary

For the role of a researcher and a designer in the process of a city development is changing. There is a need for a proactive, design process that releases the creativity of its users. This involves designing places as being “open” for changes.

The challenges for present day researchers, working with common places are:

- Constant developing of methodologies of cooperation
- Strong partnership between communities and experts
- Creation of interdisciplinary groups, which offer knowledge exchange and mixed-methods analysis to be used during group-work and common discussion of the results.
- Cooperation while working not only on the design, but also on the management plan for common places – which is important in a process orientated design (Figure 3).
- Participation in a community

In conclusion, due to the value of creation process in common places, traditional design or competitions are not accurate anymore. More of a constant group work method should be used opposed to a static ‘one point of view’ system. This is extremely important in this times where there is a rapid flow of information and trends which are against a landscape specificity creation, which leads to a landscape unification.

References

- Bernat, S. 2011. Słowo wstępne/Introduction, In: *Niematerialne wartości krajobrazów kulturowych/Intangible values of cultural landscapes*, ed. Joanna Plit, Commission of Cultural Landscape of Polish Geographical Society, Sosnowiec, 2011, 11-12.
- Capra, F., Mattei, U. 2015. *The Ecology of Law: Toward a Legal System in Tune with Nature and Community*, Berrett-Koehler Publishers.
- Conklin, J., 2008. *Wicked problems and social complexity*, internet access: <http://cognexus.org/wpf/wickedproblems.pdf>, [29.04.2016].
- Convention for the Safeguarding of the Intangible Cultural Heritage Paris, 17 October 2003, internet access: http://portal.unesco.org/en/ev.php-URL_ID=17716&URL_DO=DO_TOPIC&URL_SECTION=201.html, [29.04.2016].
- Gawryszewska B.J., 2013. *Ogród jako miejsce w krajobrazie zamieszkiwanym/ Garden as a place in dwelling landscape*, Wydawnictwo Wieś Jutra, Warsaw.
- Hoteit A. (2015), *Role of the Landscape in the Preservation of Collective Memory and the Enhancement of National Belonging*, internet access: <http://www.cscanada.net/index.php/css/article/view/6435>, CSC Canada, [09.09.2015].
- Report from public consultations in Jazdów: Latko, A., Pogoda, I., Rokita, Z., Sienkiewicz, M., Wilczyńska, A., Zielińska, E. 2014, *Konsultacje społeczne w sprawie przyszłości i form funkcjonowania terenu Osiedla Jazdów*, m.st. Warszawa, internet access: http://konsultacje.um.warszawa.pl/sites/konsultacje.um.warszawa.pl/files/raport_konsultacje_osiedle_jazdow.pdf, [29.04.2016].
- Latour, B. 2010. *Splatając na nowo to, co społeczne. Wprowadzenie do teorii aktora-sieci/original title: Reassembling the Social - An Introduction to Actor-Network Theory*, translation: K. Abriszewski, A. Derra, Universitas, Krakow.
- Mies, M., Bennholdt-Thomsen, V. 2001. *Defending, Reclaiming and Reinventing the Commons*, “Canadian Journal of Development Studies” XXII, internet access: http://commoningtimes.org/texts/mies_benholdt_defending_reinventing.pdf [29.04.2016].
- Prominski M. 2005. *Designing Landscapes as Evolutionary Systems*, Design Studies Vol. 8 (3), 25 – 34, internet access: http://www.freiraum.uni-hannover.de/uploads/tx_tkpublikationen/Designing_Landscapes_As_Evolutionary_Systems_01.pdf, [accessed 29.04.2016].
- Rittel H., Webber M. 1973. *Dilemmas in a General Theory of Planning*, “Policy Sciences” 1973, no 4, pp. 155-169.

Design-Build on the Frontlines: Most Important Questions

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design-build | marginalized communities | student advocacy

Many students entering landscape architecture programs bring a sense of urgency, ethical consciousness, and values steeped in social and environmental justice. Few American programs offer courses that tackle these issues leaving the next generation to question the role of design and its impact in addressing entrenched societal problems the profession often ignores. A few design-build programs are leading the paradigm shift, from hypothetical, "high design" to frontline community-based, responsive design, serving populations with the greatest need and least access to strategic and compassionate environmental design.¹

Bridging the Gaps

Design-build studios remain at the fringe of landscape architecture education. Most design-build programs align with a professor's individual interest; only ten courses are offered in the US.

Uniquely positioned, designers address global problems by applying sound theory, creativity and community engagement techniques to the design process. As educators, we address environmental and social justice through active engagement with marginalized communities often overlooked by practitioners.

Most academic design studios engage in hypothetical projects lacking direct community participation, feedback and engagement. Design-build (d/b) synthesizes skills taught elsewhere in the curriculum, including design, communication, and technical. Compared to typical studio-based formats, the d/b model is significant in: it encourages rapid and iterative user-driven design, works with real world constraints, and considers construction methods and materials throughout the process.

D/b projects embody the social, ecological and health priorities foundational to the profession. As demonstration projects and/or innovative strategy explorations, they serve as innovative laboratories for change. By serving marginalized populations, inmates, mental patients, the homelessness or those displaced, the education merges service and activism. Landscape architects solve problems through making, drawing and/or hands-on engagement. D/b is holistic, offering opportunities to create ecological, therapeutic and democratic spaces while reconnecting design to making. Student d/b projects vary from small environmental modifications to complex therapeutic gardens. Supported by material and monetary donations and



FIGURE 1. Meeting with veterans to discuss their thoughts on the design of the healing garden and better understand their struggles and war experiences.

modest grants, d/b relies on thoughtful detailing and efficient material use. Students learn tool and material use, design realistically, and manage projects and stakeholder engagement processes.

In the tradition of Professors Randy Hester and Carl Lynn, the younger generation is utilizing community participatory d/b to provide critical community spaces that empower, nurture and improve health.

Managing d/b projects requires considerable time, energy, dedication and tenacity. Most projects don't neatly fit into the academic schedule and the managing professor must dedicate time prior to and following the project to secure projects, plan with the community, secure resources and donations. The sustainability of such efforts is of interest to the authors since many of these projects are championed by individual faculty and not embedded in the departmental curriculum.

Shifting Paradigms | Student Perspectives

Based on conversations and student reflections, the authors have observed shifts in student's perceptions. Many seek careers fostering the activist values developed through exposure to underserved populations and eco-activism. One such example Kounkuey Design; "In 2006, while a student, I started Kounkuey Design Initiative (with classmates Jennifer Toy, Arthur Adeya, Ellen Schneider, Kotch Voraakhom, and Patrick Curran) to address neglected urban environments, that other design firms were reluctant or ill-equipped to address." Chelina Odbert (Harvard Design Magazine)

This innovative non-profit is working closely with communities to develop tactics for community generation of profits, thereby ensuring long-term success. Many practices contribute a small percentage of their profits to pro-bono work or offer time-off

for employees to participate in service projects, yet this is erratic and unsustainable means to address pressing social and environmental justice problems. By teaching the skillset needed to engage these populations and excel in resourcefulness, grant writing, entrepreneurship and project management, we believe new practice directions will emerge.

The time and funding required, liabilities faced, project management and gaining community credibility require a focused determination and tenacity to survive in the academic setting. The shifting terrain of community politics and personnel and academic regulations are notoriously unpredictable, demanding flexibility and political/social skills not as critical in other studio courses. Project complexity and feasibility must be considered and thoughtful project selection is essential. Often public agencies are too bureaucratic to operate in the required time frame and don't make good partnerships. Other agencies have or make the capacity to forge academic/public partnerships accommodating the needs and vagrancies of a design-build studio.

Interviews with the Authors

Daniel

How is the Veteran Administration Puget Sound Health Care System project bridging the gap between hypothetical studio design and reality?

We did several design projects to "prime the pump" and after eight years of advocacy found a funder and developed a four way partnership, to implement the healing garden. The students had little understanding of veterans needs and engaged directly with veterans to understand their challenges and developed greater empathy, sensitivity and purpose.

What foundational skills and principles are students learning through this project?



FIGURE 2. A mother and child waiting for a medical appointment exploring the garden and the physical rehabilitation "earth room".



FIGURE 3. A staff member enjoying a respite in the "sky room".

Using their own drawings they developed a deeper appreciation for clear construction documentation. Clear communication between the field and fabrication teams and between clients, funders and design team proved essential. Developing material and fabrication efficiencies to keep within tight budgets and timeframes and most importantly flexibility and adaptability as our motto is "there are no problems, only solutions."

What are the community impacts?

We estimate the product bringing a value four times the actual cost of materials, transportation and teaching assistants. The VA garden would not have been created without our donation. Before the garden was completed, veterans of all ages and genders and staff from all disciplines expressed their gratitude the positively impacts it had on them.

If you were not present, would these projects continue at UW?

Not sure. Other faculties are interested in working abroad and not as a required course. As a required course I raise \$75,000 each year. It took 20 years to master the teaching/fundraising responsibilities and given promotion challenges, reduced time for research I doubt anyone would devote their career to this.

What shifts are you seeing in student priorities and their professional desires?

Students want to have meaningful employment and address the gamut of societal needs and worry they won't have the necessary skills. In our exit interviews, 60% said this studio was the most valuable course they has taken and providing the tangible skills required in practice. Several want to do design/build practice, others are searching for alternative practices focusing on social/environmental justice issues.

What challenges did you face given the complexity of the client, the site and time constraints?

We work in many high-risk communities, gang territory, post war landscapes and mental hospitals, thus safety is always a priority. We work in complex environments such as the VA hospital, and realities of infection control can be challenging. We have done projects in 2, 3, and 4 and 10 weeks, ranging in scale and complexity and timeframe is always a challenge and accurate project scoping is the life line.

Julie

How is the Environmental Justice in Prison Project bridging the gap between hypothetical studio design and reality?

Between 2011 and 2013 we turned this hypothetical project into reality and constructed three therapeutic landscapes at the Iowa Correctional Institution for Women. The students developed project management and construction skills, the complexities of the US criminal justice system, and the trauma of crime.

What foundational skills and principles are students learning through this project?

The students are learning to identify the most important problems, ask critical questions and generate design solutions through engaged design processes. They are learning how to manage a construction project with intense security concerns and accept a level of imperfection and frustration that ultimately leads to problem solving and enhanced tolerance.

What are the community impacts?

A recent survey given to the offenders revealed that the therapeutic gardens are having a positive impact on their health and well-being; 86% of respondents reported that the garden helps to relax and calm them, 84% said it positively impacts with physical well-being, 76% said it helps to motivate them to make changes in their lives and 69% said it makes it easier to deal with conflict.



FIGURE 4. Students making on-site adjustments to the plan for the Multipurpose Outdoor Classroom.

FIGURE 5. Working Together: Student-offender crew constructing the Healing Garden for women with special needs.

If you were not present, would these projects continue at ISU?

Many of my colleagues are and have managed design-build projects not as a required course. It would be great to have this hands-on experience embedded in the requirements of our programme and share responsibility between faculties. I am doubtful that anyone would pick up the prison project or approach it as aggressively as I have done.

What shifts are you seeing in student priorities and their professional desires?

As students prepare to graduate, they communicate their frustration in trying to find work that is really meaningful and engaged. Many of our students choose to pursue alternative career paths with non-profits and community organizations.

What challenges did you face given the complexity of the client, the site and time constraints?

It's no surprise that a prison is a complicated venue in which to practice. We constantly face social, political and logistical challenges. We strive to balance the perspectives of those who have been victimized and the general public with the desire to improve the women's lives through environmental improvements and vocational training.

Andrew

How is the Campus Landscape as Laboratory Project bridging the gap between hypothetical studio design and reality?

Since 2010, we have designed and constructed eight green infrastructure projects on the NC State campus. We have also completed two campus feasibility studies for integrating design, science and humanities curricula into the campus landscape via design-build, and created design guidelines to guide the development of the landscapes surrounding a living-learning village focused on the seven dimensions of human health. Each course involved a diverse set of clients, stakeholders and policy

makers whose involvement has provided students a window into participatory design.

What foundational skills and principles are students learning through this project?

The most important skills are adaptability, agility and the ability to work as a productive team member. When these skills coalesce, students are able to critically, creatively and productively solve problems with extremely tight constraints (i.e., specialized programming, budgets, constructability, maintenance requirements, and deadlines), in short timeframes. Similarly, the ability to take responsibility for the construction of an idea – for better or for worse – is a fundamental project management trait. In these ways, d/b expedites students' maturation processes and establishes a vital link from theory to practice that prepares students to enter practice with real-world experience, lasting confidence and pride that they enacted positive community change.

What are the community impacts?

The studio has led to the physical transformation of numerous campus areas and shifted the perception of 'landscape' on our campus. Comparative cost analyses show that our projects are valued at 4-6 times the actual cost, including both hard and soft costs.

If you were not present, would these projects continue at NC State?

Yes, however this has not always been the case. I have nurtured long-term partnerships and developed a long-range organizational plan that now guarantees the studio funding through 2020. A critical element is the recent inclusion of a co-instructor. The purpose is two-fold: 1) reduce the intensity of d/b teaching and administrative loads, and 2) cultivate the next generation of d/b faculty. Since 2014, I've mentored a

local practitioner who co-delivers the studio. He will be the lead instructor from 2017-2020 and, starting no later than 2018, he will begin mentoring another practitioner to serve as his replacement. The goal is to provide a 5-year teacher training cycle, thereby establishing long-term programme sustainability regardless of any singular faculty member.

What shifts are you seeing in student priorities and their professional desires?

Students who participate in the d/b studio not only expect to manage projects upon graduation, they truly believe they can and should. In addition to gaining exposure to and understanding integrated project delivery, they enter practice placing high priority on careers that are rooted in interdisciplinary collaboration and participatory processes.

What challenges did you face given the complexity of the client, the site and time constraints?

Universities are often guided by a risk-averse approach. One initial challenge was getting administrators to alter their misguided view that d/b is inherently risky (liability, quality of workmanship, etc.). To affect change, the initial project maintained a narrow scope and focused on developing healthy relationships with various campus partners. Forging stronger relationships has enabled all subsequent projects to expand due to increased trust, capacity, and resources (funds, machinery, expertise, etc.). Nurturing lasting relationships has proven the essential element to overcoming a large bureaucratic infrastructure with a historically compartmentalized and complex organization.

References

- Hester, Randolph T. *Design for Ecological Democracy*. MIT Press. Cambridge, MA. 2006.
- Jost, Daniel. A Garden Behind Bars. *Landscape Architecture Magazine*. November 2013. Print.
- Linn, Karl. *Building Commons and Community*. New Village Press. Oakland, CA 2008.
1. Winterbottom, Daniel, (2011) *Effecting Change Through Humanitarian Design, Service -Learning in Design and Planning*, New Village Press
<http://www.harvarddesignmagazine.org/issues/33chelina-odbert-kounkuey-design-initiative-kenya>



Landscape Planning

LANDSCAPE PLANNING

MICK ABBOTT, WOODY LEE, XUEJING LI,
JACKY BOWRING

What is a Twenty-first Century National Park? Designing Scenarios for the Aotearoa New Zealand High Country
237

CHRISTINE BAI, SUSANNE KARN, URSINA LIEMBD
Green spaces toolbox for high quality development of green spaces in urban densification processes
241

RETO CAMENZIND, ANTHONY LECOULTRE
Innovative Approaches to Developing Open Space in Swiss Agglomerations
245

SHELLEY EGOZ
Place, Migration and Wellbeing: Landscape as the Environmental-Social Interface for Belonging
249

LUCA MARIA FRANCESCO FABRIS, GUIDO GRANELLO
Connecting Brescia's Urban Sprawl: The 'Park of Pits' Case
251

PAULO FARINHA-MARQUES, CLÁUDIA FERNANDES,
FILIPA GUILHERME
Planning for Biodiversity in Public Gardens and Squares: Two Cases in Porto, Portugal
255

SARA FAVARGIOTTI, JEANNETTE SORDI
Ecolecce. Landscape as Urban Development
259

SAGRARIO FERNÁNDEZ RAGA, CARLOS RODRÍGUEZ FERNÁNDEZ

Highlighting Landscape Events in the Way of Saint James: Rapperswil and Puente Villarente
263

DANIELA GAŽOVÁ
Scattered Settlements - Redevelopment of Neglected Landscapes
267

MOJCA GOLOBIČ
Managing Cultural Landscape Diversity: From an EU and Local Perspective
273

QIAN GUO, RAN LI
Back to Shanshui: Dwelling in the Mountains of Shihua Cave
277

CHRISTIAN KÜPFER
Avoid – Mitigate – Compensate: How to Halt the Loss of Biodiversity in Urban Agglomerations?
281

ELISA LÄHDE, ELINA KALLIALA, MARI ARILUOMA
Urban Planners' Understanding of the Green Infrastructure Concept
285

JIJIAO LIU
Green Open Space Development in Dachang Under the Influences of Jing-Jin-Ji Regional Integration Policy
289

EYLUL MALKOC, ENGIN NURLU
Multi Temporal Mapping of Forest Landscape Change in the Mediterranean Region: The Mountain Bozdag
293

BRUNO MARQUES, ASHLEY HUNTER, KURT COLE
Bridging the Gap: Indigenous Methods as Necessity to Heal Landscape and Enhance Cultural Identity
297

ANA MEDEIROS, CLÁUDIA FERNANDES
Planning and Designing for the Visitation of a Roman City Landscape – Tongobriga
301

MIYAGAWA TOMOKO, OTSUKA NORIKO,
ABE HIROKAZU, KUROSE TAKEFUMI
Greening Brownfields with Open Space Strategies in Sakai City, Japan
307

ROSALEA MONCELLA, CRAIG DOUGLAS
Transiting Cities: Mediating Change for Uncertain Futures
311

NATHALIE MONGÉ, KATHRIN MERZ
Landscape Architecture in elop* Transdisciplinary Projects
315

DANIEL MÜNDERLEIN, DIEDRICH BRUNS
Visual Methods in Landscape Architecture Research
319

NATALIJA NIČAVSKA, DAIGA ZIGMUNDE, MADARA MARKOVA, UNA ĪLE, KRISTĪNE VUGULE
Bridging Landscapes and Cultures Within the International Summer School's Experience
323

NADJA PENKO SEIDL
Turning Gaps into Bridges: Towards Integral Management of Landscapes
327

ROBERT RIBE, MADELEINE MANYOKY, ULRIKE WISSEN HAYEK, ADRIENNE GRĒT-REGAMEY
Factors Influencing Public Perceptions Of Wind Parks: A Laboratory Test Using Video-Acoustic Simulations
331

CARLOS RODRÍGUEZ FERNÁNDEZ, SAGRARIO FERNÁNDEZ RAGA
Landscapes by Extraction: Contemporary Approaches to the Roman City of Tiermes, Spain
335

JAVIER RUIZ SÁNCHEZ, MATTIA BERTIN
Understanding Uncertainty in Cultural Landscape. A Hermeneutical Approach to Catastrophe
339

OLAF SCHROTH
Implications of the EU Revisions of the Environmental Impact Assessment (EIA) for Landscape Planning
343

HIMANSU SEKHAR MISHRA, SIMON BELL
An Assessment of the Relative Contribution of Private Residential Gardens to the City-Wide Green Space Benefits and Services: The Case of Tartu, Estonia.
347

SHUREEN FARIS ABDUL SHUKOR, NUR SYAKIRA AMIRA AMAT, SUHARDI MAULAN, SA'ARI MOHAMAD YATIM
The Use of Green Outdoor Environments for Cardiac Survivors' Rehabilitation Therapy
351

SHUREEN FARIS ABDUL SHUKOR, MOHD NASIR BAHARUDDIN, SHAMSUL ABU BAKAR
The Identification of the 'Nature Index' in Malaysian Landscape
355

DOMINIK SIEGRIST, LEA KETTERER BONNELAME
R-Types – Development of a Typology of Recreationists as a Base for Planning and Design of Nature-Based Recreation Areas
359

ELISABETH SJÖDAHL
Landscapes of Water – How can Mapping in Inundation Areas Create new Planning Tools?
363

ERIK SKÄRBÄCK, PATRIK GRAHN
People's Preferences for Outdoor Affordances are Relatively Similar Irrespective of Cultural Background
367

JOANNA T. STORIE, SIMON BELL
Putting People First! Exploring How to Improve Public Participation in Planning: Case Studies from Latvia and Estonia
371

DORA TOMIĆ RELJIĆ, SONJA BUTULA, INES HRDALO, PETRA PEREKOVIĆ, GORAN ANDLAR
Overcoming the Institutional Approach to Protection Through Landscape Modeling
375

LAURA WINGE
How Can Urban Designers Take Advantage of the Invisibilities when Designing Urban Environments with Local Citizens?
379

ULRIKE WISSEN HAYEK, ADRIENNE GRĒT-REGAMEY
Bringing Landscape Visualization Tools to Practice: Prerequisites for Successful Development Approaches
383

NA XIU
Planning and Design of Urban Green Networks in Stockholm
387

What is a Twenty-First Century National Park? Designing Scenarios for the Aotearoa New Zealand High Country

MICK ABBOTT | WOODY LEE | XUEJING LI | JACKY BOWRING

Lincoln University, New Zealand

national parks | design-directed research |
multi-functional landscapes | wilderness

Like many countries of the New World, Aotearoa New Zealand's national parks bear the legacy of 19th Century landscape concepts, imprinting a nature-culture divide that perpetuated ideas of the wilderness as pristine. How can designing imagine scenarios for national parks which transcend the binary of 'in' or 'out' of the park? And while 'nature' and 'wilderness' are cultural constructs, in the New World post-colonial nations like New Zealand, the Americas, and Australia, national parks tend to be perceived as places where culture stops and nature starts; culture is suppressed, nature is 'preserved' as a terra nullius (Park 2006). How can national parks be conceived as places where culture and productivity actively contribute to landscape health – rather than the presumption that human activity contradicts parks' status? (Weller 2015) Using design-directed research (Roncken 2011), we juxtapose elements that are commonly considered as mutually exclusive and from this generate possibilities for other concepts of national park. The high country of the Mackenzie basin, where research was undertaken, is made up of large leasehold farms cut across by rivers and infrastructure including roads, farms, and canals that form part of the hydroelectric power generation system. The area abuts Aoraki Mount Cook National Park, a spectacular mountainous landscape. Recognising that we need to overcome our blindness to the interaction between the complex relations between natural and cultural landscapes (Phillips 1998), the scenarios explore how rivers, farm infrastructure, canals, and remnant ecologically-rich pockets provide the armature for new national park concepts. Our paper presents six drivers and five resulting concepts that build on these ideas, and can be hybridised in terms of both spatial configuration and phasing to produce further potential frameworks. We critique these concepts not only for their relevance to the Mackenzie basin, but also for their transferability to other settings as a means to enrich interactions of culture and nature beyond the static vacuum of a pristine wilderness.

Introduction

In the landscapes of the New World, the term 'national park' is associated with an area of land which is locked up, and apart from people. The sequestering of land for parks was based around aesthetic ideals and notions of pristine wilderness, and involved drawing a line on a map – on one side was nature and the other side was culture. This paper explores the possibility for an innovative approach to national parks, looking at the creation of a Drylands Park within the Mackenzie Basin, a high country plateau landscape in the centre of Aotearoa New Zealand's South Island, within the Southern Alps. Following the legacy of national parks, the default form for the park would be a stand-alone conservation park, as shown in Figure 1. However, the Mackenzie is an area ripe for innovative thinking, as signalled by the landmark agreement between multiple stakeholders (The Mackenzie Agreement no date).

The Mackenzie Agreement is a collaborative document which responds to a shared desire for consensus amongst farmers, environmentalists, the tourism industry, businesses and the community. The Agreement is landmark exemplar of collaborative process in Aotearoa New Zealand, and is an interweaving of a complex network of outstanding natural landscapes, biodiversity values, and a place which is the home and livelihood of the people who live there. One of the key dimensions of the Agreement's vision is "A land use pattern which includes a mix of irrigated and dryland agriculture, tourism related development, and land actively managed for biodiversity and landscape purposes, with integration of these wherever practical" (The Mackenzie Agreement no date, p. 4).

In this context of a vision for the Mackenzie basin how might key drivers generate a land use balance that benefits both nature and the community?

THE DEFAULT OPTION: A STAND ALONE CONSERVATION PARK

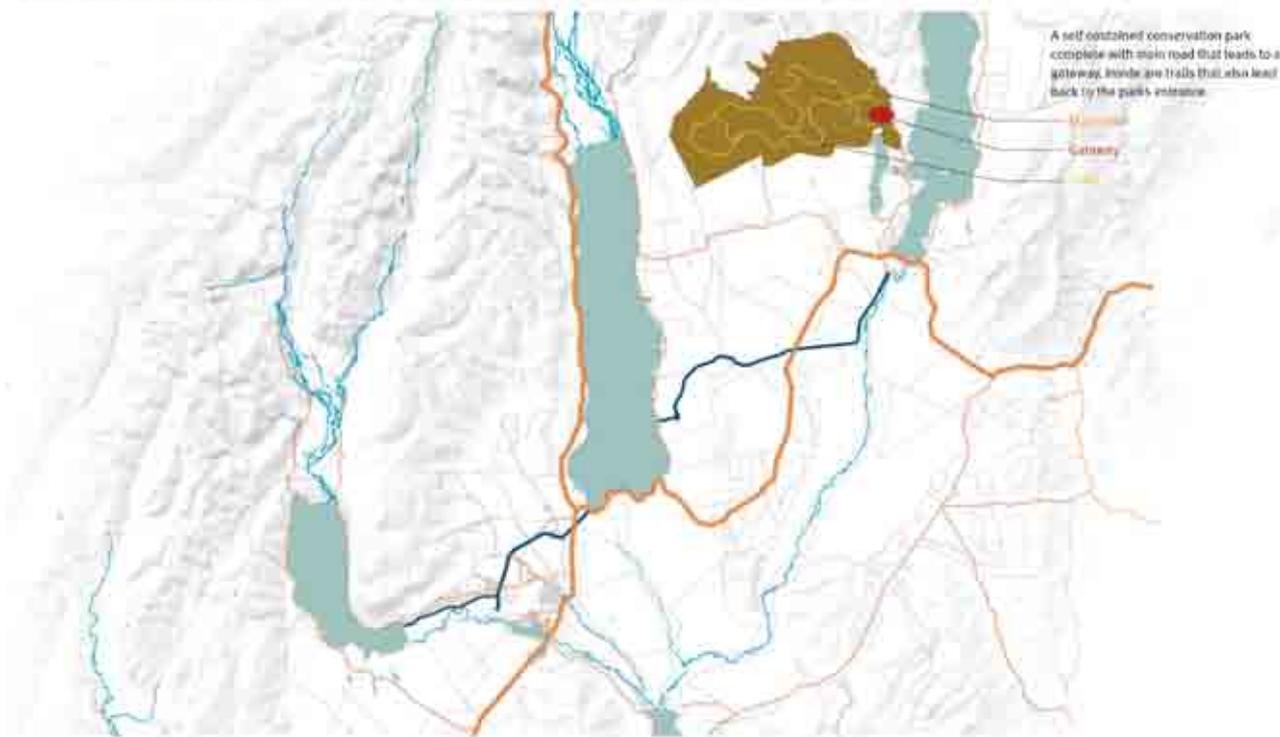


FIGURE 1. The Default Option: A stand alone conservation park.

Design-Directed Research

Using design to research the potential of interfacing the Mackenzie Agreement's desire for breadth and interrelation of land uses yielded innovative responses. The design research process involved senior landscape architecture students working with the three themes identified in the Agreement: conservation, protection, tourism. Each student had a dominant theme, secondary theme, and an ignored theme – for example student 1 had conservation as their dominant theme, protection as their secondary theme, and ignored tourism. Through the juxtaposition and prioritisation of themes the students worked with elements that are commonly considered as mutually exclusive. The friction between the paired elements encouraged forays into unexpected design territory, a contrast with the conventional studio brief which is site and problem focussed. The findings were then analysed by the DesignLab research team and six drivers were identified, along with the multiple land uses that they enable.

Six Key Drivers for Landscape Planning

Challenging the binary vision of seeing landscapes as either 'in' or 'out' of the national park, the Drylands Park project explores how a more nuanced conception of landscape planning can provide multiple benefits across time and space. Six drivers were identified, creating an expanded field of multifunctional landscapes: 1. Protection and connection of rivers and lakes; 2. Paths across the Basin; 3. A distributed park with disturbed ownership; 4. Reducing impacts at sensitive interfaces;

5. Opportunities for tourism activity; 6. Canal water farming. These are illustrated in Figure 2, demonstrating how the conception of the national park has escaped the boundaries of a stand-alone designated space, and now occupies the whole of the basin, merging culture and nature.

Multifunctional Landscapes

Overlaying these six key drivers amplifies the potential for a twenty-first century national park, one which eschews the binary of 'in or out' of the park in favour of a distributed and occupied landscape with multiple functions and benefits. The images in Figure 3 illustrate how the different drivers might form diverse components of this national park. Rather than a view being of land that is either 100% or 0% protected as in the conventional national park model, there can be diverse mixes of access, protection, farming and tourism.

This diversity is in constant flux, responsive to the shifting demands, and also to the ways in which landscapes continually evolve and change. Figure 4 indicates how the layering and phasing options might change over time, at different scales. There needs to be scalability to the proposals and an ongoing attention to the evolution and establishment of landscape components. Nothing is instant in the realisation of landscape plans, and nothing is definitive. The idea of designing process rather than product recognises landscape's constant unfolding, and that it is always in a state of becoming.

**SIX KEY DRIVERS:
THAT TOGETHER CAN CREATE A MULTIFUNCTIONAL LANDSCAPE.**

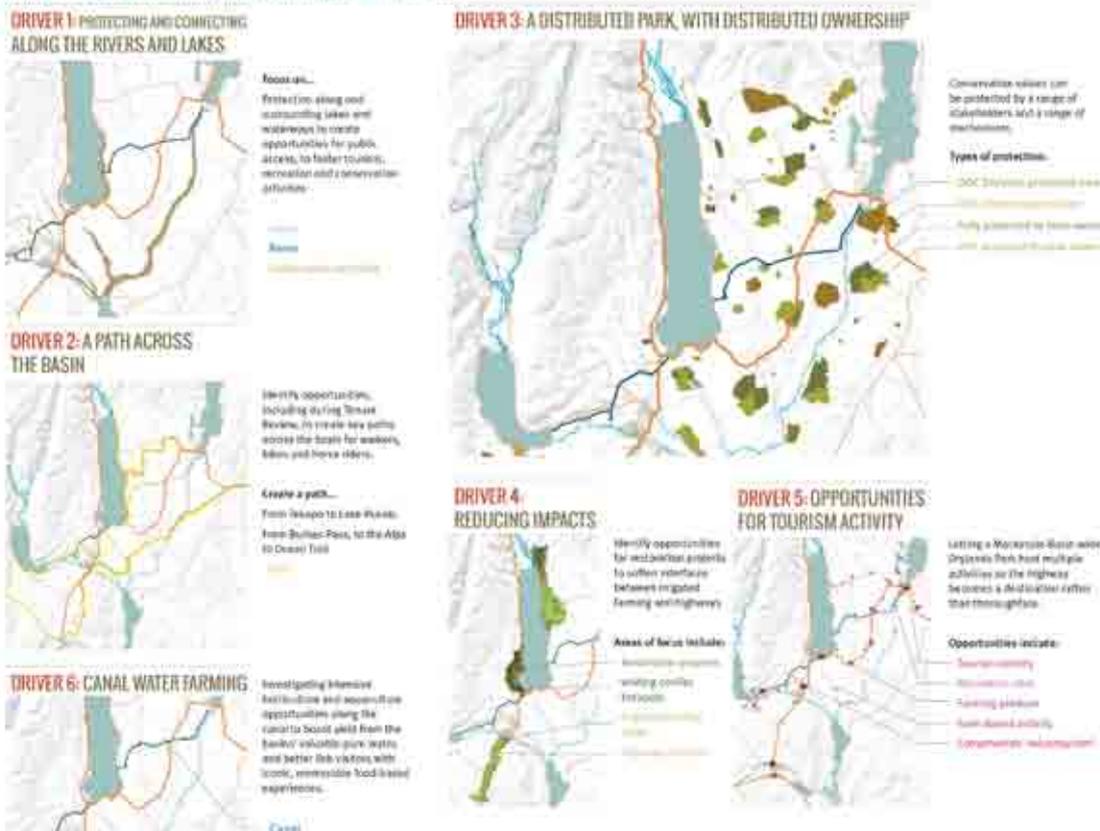


FIGURE 2. Six Key Drivers

Stories of provenance can flow from the distributed park, where produce is imbued with the sense of place that derives from the region and the overall ethos of care. The pockets of biodiversity, regardless of land tenure, all help to build towards the targets of the Aichi protocol (Convention on Biological Diversity no date).

Conclusion

The project for the Mackenzie Drylands Park brought findings in two key areas of relevance to landscape architecture - landscape planning and design-directed research. First, designing the possibilities for a twenty-first century national park revealed findings which expand ideas on landscape planning for conservation, protection and tourism. While there are hard lines drawn between these three functions within the present approach to landscape planning, the dissolution of these boundaries imagines an expanded field where functions are overlaid and morphing through time and space. This allows for a liberation from limiting situations – for example the decoupling of public access from biodiversity protection means that a greater range of landscape experiences are afforded. And the merging of the values of production and preservation create fresh perspectives on our relationship with the landscape, with what we might harvest, and how we invoke stewardship.

And second, the project contributed to the burgeoning field of design-directed research through a process which was based on problem-finding, juxtaposition of elements that drove the generative phase, and a critical perspective on the context. These factors encouraging an opening out of possibilities, an expanded scope of the nature of the issues and opportunities.

References

Convention on Biological Diversity, No Date, Aichi Biodiversity Targets. <https://www.cbd.int/sp/targets/> accessed 27 April 2016.
 The Mackenzie Agreement (no date) <http://mackenziecountry.org.nz/> accessed 27 April 2016.
 Park, Geoff (2006). Theatre Country: Essays on Landscape and Whenua. Wellington: Victoria University Press.
 Phillips, Adrian (1998). The nature of cultural landscapes – a nature conservation perspective. Landscape Research, 23(1): 21-38.
 Roncken, Paul (2011). Productive nature and the future sublime. JoLA Journal of Landscape Architecture, 6(1): 68-81.
 Weller, Richard (2015). World P-Ark. LA+, 01 (Wild).



FIGURE 3. 100% Mackenzie Country – six images for six drivers

LAYERING AND PHASING OPTIONS OVER TIME AND AT DIFFERENT SCALES

Creating a landscape plan isn't an instant process. It requires several approaches to understand the landscape, assess the multiple goals to be met, and then develop a plan that is both realistic and achievable. It's a process that evolves over time and at different scales. Further plans might be needed to address specific areas and to coordinate with other plans and programs.

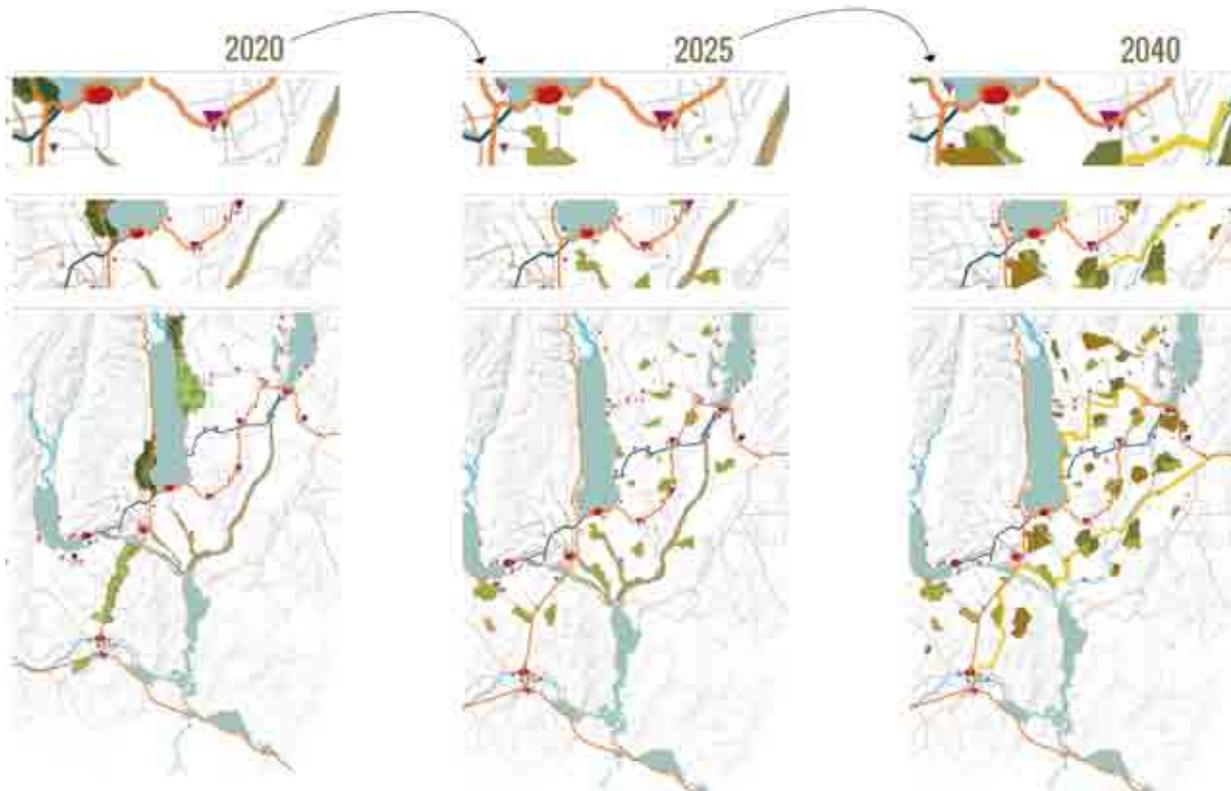


FIGURE 4. Layering and Phasing options over time and at different scales.

Residential Environment Toolbox for High Quality Development of Green Spaces in Urban Densification Processes

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quality of residential environment | urban densification processes |
building density | urban development | suburban development

Town planning offices as well as planning and civil engineering departments of councils are facing great challenges when implementing the political and public demand for high quality urban development, particularly in ensuring and developing quality standards of residential environments. There is high complexity in planning processes for existing building and property structures. Necessary urban development projects often fail in the political consensus-finding process due to lacking public support.

That leads to the question of what really represents good quality of residential environment in urban densification and how to communicate this quality. A second question is how to safeguard and develop the quality of residential environments with suitable tools and processes. Project goals and expected results are to be elaborated and a green spaces toolbox "residential environment quality" for local town planning offices and consultancy firms is to be tested. By analysing urban development projects, the impact of structural densification on residential environment will first be investigated and criteria will be developed for the quality of residential environment. By appraising good-practice examples, success criteria of planning processes will be analysed and approaches developed to steer the safeguarding and development of urban residential environment. Application and effectiveness of the toolbox will be tested in discussions with relevant stakeholders and experts.

Starting Point, Problems and Leading Questions – Changing Open Space in Habitations Due to Higher Density Construction

Local town planning offices and consultancy firms are facing great challenges when safeguarding the quality of areas surrounding habitation, as required by the Federal Spatial Planning Law (RPG; cf. to Art. 1 of the RPG). In terms of quantity there is less free space available for an increasing number of people. Another challenge is provided by the high degree of complexity of planning processes in various types of construction and ownership structures. Even though economical land usage and a stop to urban sprawl are desired by politicians and society, the necessary environmental development projects of councils often fail in the political consensus-finding process and lack support by the population concerned.

Therefore, the following two questions will guide us through the study:

1. „What is good environmental quality in higher density construction and how can it be communicated?“
2. „How can good environmental quality be protected and developed with appropriate instruments and processes?“

Bridging the Gap of Spatial Planning Limitations Through Interdisciplinary Teamwork

At present, higher density construction takes mostly place in small-scale social and property structures. Practical, well-designed and economically sensible environment supplies for various user groups can no longer be implemented on individual private plots due to increasingly limited availability of space.

Securing and developing environmental quality with increased density requires transcending traditional spatial planning limitations (forms of property, plots). Innovative approaches



FIGURE 1. Residential environment designed according to ecological criteria with integrated mature tree population. Siedlung Escher Park in Zurich. (Photo U. Liemdb)



FIGURE 2. Green residential environment on a slope with strong contextual anchoring. The design relates to lokal site characteristics and consciously deals with topography. Siedlung Hagenbuchrain with Hagenbuchrainbach in Zurich. (Photo U. Liemdb)

are to be taken in order to better combine ranges of interest and influence of various actors. Thus, high quality development requires transcending traditional planning instruments and approval processes. It takes place at trans- and interdisciplinary level and increasingly at eye level with private land-owners as cooperation partners. As a result, the project team consists of landscape architecture, spatial planning and social work disciplines. In addition, the councils of Green City Zürich, Schlieren and the communities of Muri near Bern and Herisau as public entities as well as the private planning offices Metron AG, ERR Spatial Planners AG and Planpartner AG are central implementation partners in the research project.

Project Aims, Expected Results and Research Design

The two overarching project aims are developing foundations of assessment for urban environmental quality and design approaches for the planning of residential environments. The product is a tried and tested “residential environment” toolbox with criteria of quality and design approaches for planning and construction offices and consultancy firms. The research results lead to a report and an online information platform for “residential environments”.

The project is divided into analytical and action-centred building blocks. These are assigned to the three phases analysis, derivation and testing. After each phase, there is an intermediate evaluation (Go / No Go decision). This assesses if the subsequent aims can be reached or if adjustments to the project design need to be made. The Go / No Go decision is taken together with all project partners.

Methodological Approach and Preliminary Results

The project is running for two years (until the beginning of 2018). At present, the foundations of analysis are developed. Based on these, the first guiding question “What is good environmental quality in higher density construction?” should be answered. Thus, a notion of quality is to be developed for various samples of density, construction and resident structures.

As analytical foundation, quality criteria for habitational environment were developed on the basis of extensive literature research. There, the focus was laid on the resident perspective for design and usefulness as well as ecological quality. Besides, the habitational context is not assessed as a system closed by plot borders, but analysed according to functional and social space entities.

This analytical foundation and the resulting catalogue of criteria for the assessment of residential environments were tested and further developed on the basis of recently executed higher density development projects in the communities involved. The selection of projects was based on the recommendations of the participating communities. In addition, they represent various approaches for higher density habitation and various types of habitational structures.

In parallel, planning documents are analysed and structured interviews are conducted with residents, owners and planning authorities to evaluate the realised projects. The planning document analysis and the interviews should reveal which qualities were aimed for and achieved, and how the various actors assessed the projects. This first project phase finishes with a systematic overview of high quality surroundings in higher density habitation as well as a documentation of the present state in research. Based on this, the catalogue of criteria is further analysed and developed with regard to key qualities in the context of increased density. Based on various approaches to denser construction, recommendations should be defined and specified for spatial quality in relation to specific usage demands. The developed catalogue of criteria becomes better tangible by an appropriate description of specific indicators and their application for various planning levels, e.g. strategic planning, execution and usage phase.

Outlook on Testing and Safeguarding Strategy

In the next project phase, planning and communication foundations on the habitational context are designed together with the spatial planning and social work disciplines. The quality criteria developed in the first phase serve as a list of arguments on which a web-based data base is made with options for queries.

The first draft of the “residential environment” toolbox (test version of the data bases as well as documentation in the work report) is tested once more on the basis of a case study analysis. For this analysis, a total of eight application cases, which cover the various approaches to high-density and habitation types, are selected with the involved communities. Thus, the draft of the toolbox is tested and its applicability evaluated as well as the need for adjustments assessed. As safeguarding strategy, the content of the toolbox is discussed in the context of a project workshop with the research and implementation partners.

Bridging the Gap – From Research to Practical Product

Just to develop a definition of quality for “residential environments” is a challenge. Furthermore, there is the task of communicating this notion of quality and finally protecting it in the planning process. Only an interdisciplinary team can meet these challenges. The greatest challenge consists in translating the complex, detailed research study into an easily applicable and practice-centred tool as final product. Focussing on bridging this gap, not only the application tool is to be seen as an important result, but also the interdisciplinary discourse, which provides an important contribution to current events in higher density construction.

References

- Gruehn, D., Budinger, A., 2013. Grünflächen und Freiräume als Einflussfaktoren für den Wert von Grundstücken und Immobilien in deutschen Gross- und Mittelstädten. In: *ZdW Bay* 103 (3). S. 118-119.
- Kemper, R. and Schöffel, J., 2014: Die Bedeutung des Wohnumfelds für die Bau- und Immobilienwirtschaft. In: Drilling, M.; Schnur, O. (Hrsg.): *Zwischen Lebenswelt und Renditeobjekt. Quartiere als Wohn- und Investitionsorte*. Bielefeld: Springer VS.
- Natrup, W., 2013. Innenentwicklung – Chancen und Grenzen. Vortrag zur Tagung „Innenentwicklung Schweiz: Möglichkeiten und Herausforderungen“. ETH Zürich. 6.-7. Juni 2013. Zürich.

Innovative Approaches to Developing Open Space in Swiss Agglomerations

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open spaces | landscape | agglomeration programmes |
model projects | densification

Three-quarters of the Swiss population live in towns and agglomerations. Attractive green spaces, quiet neighbourhood streets and squares, as well as nearby recreation areas, are key to a high quality of life. The desire to achieve inward settlement development is both an opportunity and a challenge for open spaces. We define open spaces as all areas of land which are open to the sky and not occupied by buildings. Their strategic development demands a new way of thinking that is interdisciplinary and cross-border, embedded in an overall vision, and based on participation. What this means in practice is illustrated with a few examples from the Swiss Confederation perspective.

Challenges, Instruments and Strategies

The implementation of the revised Swiss Spatial Planning Act poses the challenges of achieving high-quality inward settlement development and preserving the agricultural areas while improving the landscape. In Switzerland, the cantons and communes have the main responsibility for implementing spatial planning. However, the Confederation also has a number of instruments (Table 1) with which to support them. These provide a legal basis and also promote innovative processes. Inward settlement development must be combined with the following strategies:

1. Secure and enhanced large green belts and local recreation areas ('agglo-parks') for the long term.
2. Promote multifunctionality: particular deficits exist with regard to health, sport and exercise, biodiversity, nature discovery, meeting places and adaptation to climate change.
3. Improve the landscape and natural assets: parks ('green'), rivers ('blue') and other open spaces ('grey') network.
4. Cross-border cooperation to link local (neighbourhood) and regional (agglomeration/urban-rural) approaches.
5. A selection of interesting examples in which the Swiss Confederation is involved is presented below.

Table: A selection of instruments promoting the development of open space in Swiss agglomerations.

Instrument	Area	Duration
Model projects	Flagship projects – interdisciplinary and implementation-focused www.aren.admin.ch/themen > Modellvorhaben ¹	Up to 3 years
Agglomeration programmes	Funding for transport infrastructures in the agglomerations, coordinating urban development and transport, inward settlement development. www.aren.admin.ch/themen > Agglomerationsprogramme	Iterative four-year cycle
Pilot projects	Programmes for adaptation to climate change, sustainable development, and biodiversity (the Fröschmatt pilot project): Adaptation to climate change www.bafu.admin.ch/klima > Anpassung an den Klimawandel > Pilotprogramm > Cluster Klimaangepasste Stadt- und Siedlungsentwicklung Sustainable development: www.aren.admin.ch/themen > Förderprogramm Nachhaltige Entwicklung Biodiversity: www.bwo.admin.ch/themen > Fokus Wohnen > Wohnen und Wohnumfeld > Fröschmatt	2 – 3 years
Nature discovery parks of national importance	A means of supporting nature and heritage conservation, with a dedicated national parks label www.bafu.admin.ch/themen > Pärke	4-year set-up phase, 10 years for the label
Building exhibition	An innovative urban planning process (IBA Basel) funded via the EU Interreg IVa programme and Switzerland www.iba-basel.net	10 years

¹ Further information is available in German, French and, in some cases, Italian

TABLE 1. Instruments



FIGURE 1. Information event at the end of the Fröschmatt project in 2014. In the foreground is one of the new natural habitats – a wet biotope, which is refilled by rainwater from the roof.

1. Secure and Enhanced Large Green Belts Parco del Lavaggio (Model Project)

The Parco del Lavaggio model project submitted in 2014 by the private organisation Cittadini per il territorio with the canton of Ticino perfectly captured the Zeitgeist in the Mendrisio area. Over a quarter of a century, urban sprawl has destroyed large parts of the Lavaggio River. This is now to change. Recognition as a model project was a significant factor in the Cittadini per il territorio's success, in only a short time, in persuading the canton to include the area concerned as a 'local recreation area' in its cantonal structural plan, and redraw the line limiting settlement growth. Now that the general planning framework has been corrected, work can begin on 'repairing' the area as a space for leisure. Planning for this is to start in the autumn (2016) in the form of a cantonal land use plan.

Bernex-Confignon (Agglomeration Programme)

In an international competition, bids were invited to turn a nine-hectare agricultural area on the edge of Geneva into a public park. The basic premise was to keep the productive agriculture, while also offering an attractive recreation area for local residents. The winning project plans to use one third of the space for recreation, one third for agriculture, and one third for a small restaurant selling produce, as well as small allotments. Work on realising the plans will begin in 2017 at the earliest. The park forms part of the Grand Genève agglomeration programme. Its funding has been secured under cantonal legislation. The parc agro-urbain is a good example of a holistic approach which encompasses an urban space, transport and the landscape. As plans for the park are being drawn up, the Route de Chancy has been redeveloped and a tram line extended. In addition, the Grand Genève agglomeration programme has determined the eastern part of Bernex as a strategic location for a denser mix of residential and business land use.

2. Promote Multifunctionality Fröschmatt (Pilot Project)

To date a unique pilot project between the federal government and the city of Bern, the refurbishment of the Fröschmatt complex in Bern has an element of serendipity about it. This 1950s residential development was renovated not only in terms of apartment structure and energy (to Minergie P-Eco standard), but also outside environment, which was redesigned according to tenants' needs and clear biodiversity aims. To achieve this, a participative process was conducted in 2013-2014 involving the tenants, neighbours, specialists and the property management department of Bern. The objective was to arrive at a positive social environment with a high degree of acceptance for the planned biodiversity measures. The process encouraged residents to take independent responsibility, and also increased awareness of the careful use of outside space. Further positive effects include longer tenancies and lower maintenance costs.

Promoting Sport and Exercise as Part of Everyday Life (Model Projects)

Open spaces that encourage movement have a positive effect on health, sporting activity and exercise. Three model projects have therefore been set up by the federal government to address these issues. In Sursee, a cooperative and intersectoral planning approach focusing on adolescent and senior groups has been set in motion at the regional level. The Zurich metropolitan area is also pursuing an interdisciplinary approach in its two test areas in Eastern Lucerne and Wil, in the canton of St. Gallen. Here the focus is on networking recreation areas with non-motorised transport. The town of Winterthur already has a great deal of experience in making sport and exercise part of everyday life. For example, it allows residents to use sports infrastructures as public spaces. Its model project now aims to go a step further and investigate how various stakeholder interests can be factored in to changes to planning legislation.



FIGURE 2. Agglomeration Lausanne-Morges. (PALM 2012)
The map shows the location of the five agglomeration parks in relation to the city or local centres.

3. Improve the Quality of Landscape and Natural Assets

Lausanne-Morges (Agglomeration Programmes)

The Lausanne-Morges agglomeration programme is designed to encourage a compact perimeter for urban development. As part of this, it designated specific strategic locations, so that green spaces in immediate proximity to built-up areas can be both preserved and developed. A further part of the agglomeration programme is the landscape concept, which aims to densify public spaces. This has a structural impact on urban development and transport. Since the agglomeration programme coordinates settlement growth with the transport infrastructure, the green spaces are networked effectively with non-motorised and public transport. The agglomeration programme also includes five agglomeration parks – large, open spaces within the compact perimeter which are to be preserved for the future. Furthermore, a project is underway to establish Switzerland's second nature discovery park on the edge of the Lausanne-Morges agglomeration. With its proximity to Lausanne, its appeal to the agglomeration's population and its large untouched forest, the *parc naturel périurbain du Jorat* has a good chance of earning the official park label once it has been set up.

4. Cross-Border Cooperation

IBA Basel (Building Exhibition)

The term 'building exhibition' refers more to a process of urban planning than it does to an actual exhibition. It is based on the German term *Bauausstellung*. This instrument is being applied internationally for the first time in Basel. The *Internationale Bauausstellung Basel* (IBA) programme is pursuing the implementation of exemplary projects (architecture, city planning and landscape) over a ten-year period up to 2020. The *Rheinliebe* project groups together all IBA projects along the river Rhine. These include tours, riverbank development,

strengthening shared urban development with a circular walk along the banks of the Rhine, and ideas to link Bad Bellingen with the Rhine once again. The 3-Land project, which provides for shared urban development in the communes of Basel (CH), Weil am Rhein (D) and Huningue (F), is intended to turn the riverbank areas on both sides of the Rhine into public areas which are accessible to non-motorised transport.

Conclusion

The examples described here show that inward settlement development is an opportunity for open spaces as an element of quality of life in agglomerations. This also requires a fundamental change in organisation, as well as in behaviour at all levels of government, as well as in the private sector. A particular feature of the innovative processes featured here is the spill over effect they generate. Collaboration between different levels of government and between public and private stakeholders creates new perspectives. A common consciousness is important in changing the spatial, organisational and legal framework. As is normal in Switzerland's federalist system of spatial planning, the instruments are used in different ways and contexts. This enables plans and projects to be implemented in a way that best suits the local or regional circumstances. The public sector can exert only limited influence over action taken on private land, but it can be proactive in demanding standards, entering into partnerships, or offering financial incentives. It can also convince the private sector that it, too, benefits from attractive open spaces. The Swiss Confederation will continue to promote the strategies mentioned here, and the use of the four successful instruments in the future. As a project that will span generations, all are called upon to do their part.

Place, Migration and Wellbeing: Landscape as the Environmental-Social Interface for Belonging

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landscape and migration | landscape and wellbeing |

landscape architecture social role | centre for landscape democracy

The European Landscape Convention's definition of landscape as an entity 'perceived by people' poses a considerable challenge to those who are involved with landscape change. "People" are not homogenous and the current societal crisis, with the influx of refugees and migrants into Europe has even more profound implications on the management, planning and protection of the landscape 'as perceived by people'. Displacement, migration and relocation denote mobility in a space; they are terms reflecting that the physical environment has a major role in the human experience. If so, wellbeing relies on landscape which is the physical living outdoor environment that ought to support human survival, dignity, and physical and emotional needs all at once. This paper discusses concerns of bridging the gap between place and people at times when people are challenged by a need to adapt to new landscapes, and local communities are experiencing landscape and social changes due to an influx of newcomers. To this end, the argument is that there is a need to extend traditional landscape analysis measures and think 'beyond the box' to address the complexity embodied in societal challenges related to mobility and place.

The experience of migration is closely associated with terms such as "displacement" and "relocation" suggesting that notions of place/landscape as material tangible entities play a major role in the human experience. Part of wellbeing relies on landscape, the physical living outdoor environment that would support human survival, dignity, and physical and emotional wellbeing all at once (Egoz et al. 2011). The European Landscape Convention's definition of landscape as an entity 'perceived by people' (ELC 2000) poses a considerable challenge to those who are involved with landscape change. "People" are not homogenous and the current societal crisis with the influx of refugees and migrants into Europe has even more profound implications on the management, planning and protection of the landscape 'as perceived by people'.

Landscape architects carry out landscape analyses assessing the value of local physical features to people, whether natural such as mountains or water bodies, or human-built structures that stand for symbols of identity and sense of place, considered as 'local heritage'. Local heritage refers to a notion associated with history and rootedness in place. Those who are newcomers, are not 'rooted' in place are often marginalised and considered inferior to those who have been settled for long periods (Egoz 2013).

In line with the concepts of the right to landscape (Egoz et al. 2011) and landscape democracy (CLaD 2014) this paper asks: What then is the role of landscape, both as an idea and a place of living, in addressing issues of justice as promulgated by the ELC, in the current migration crisis?

While several social science scholars including landscape architects had in their studies addressed topics related to uses and perceptions of landscapes by migrants (e.g. Byrne and

Wolch 2009; Höglhammer et. al. 2015; Kloek et al. 2013; Buijs et al. 2009, Armstrong 2004, Castiglioni et al. 2015) the challenge for landscape architects remains. Landscape architect Clare Rishbeth argued that “*people from ethnic minority backgrounds are very rarely represented in professional fields concerned with the design or management of the environment*” (2001: 351). Rishbeth is a landscape architecture pioneer in this area, taking on two community projects on landscape experience and migration (Rishbeth and Finney 2006; Rishbeth and Powell 2013). Her findings are that nostalgia, i.e. memories of past landscapes, and novelty, the excitement to be found in new outdoor experiences, were two main characteristics that typify the migrant respondents in the studies in Sheffield. The general conclusion and reflections on implications to landscape architects, nonetheless, are not entirely different from good practice principle guidelines for design of public spaces, including qualities such as legibility, providing safe spaces and opportunities for socialising. Yet, it is the particular emphasis on the significance of such attributes in the context of newcomers’ vulnerabilities and creating opportunities for adapting and developing a sense of belonging that designers should take on (Rishbeth 2016).

Notwithstanding the above findings, I argue in this paper that in reference of the current societal challenge of large numbers of people trying to adapt to new places in Europe, there is a need for professionals and educators to dig further into this complex topic, including a discussion on the ethics of the social role of landscape architects. This will enable opportunities for surfacing knotty political issues of inclusion and exclusion and generating critical disciplinary discourse on migration and landscape.

Designers and landscape architects hold particular visionary and spatial analytical tools that have potential to make significant contributions to such challenges.

Some of the questions to address in landscape planning and design education, research and practice include:

- How can decisions on relocation and resettlement of the displaced, be assessed based on the capacity of the landscape to contribute to a sense of belonging? This knowledge, for example, has the potential to influence policy makers in the settlement of refugees.
- What opportunities embedded in the qualities of the landscape can be identified, in order to bridge the gap between autochthonous inhabitants and newcomers?
- How can landscape education, as promulgated in the ELC, become the social-environmental interface for instilling a sense of belonging in both long term and newly arrived residents?
- What is the ability of the landscape and what are the opportunities of landscape to become the mediator between newcomers and autochthonous to encourage positive social integration experiences and processes?

Such questions and more are the beginning of engaging in critical societal and professional discourse, producing theoretical, methodological and applied knowledge in line with the objectives of the Centre for Landscape Democracy (CLaD)

at the Norwegian University of Life sciences (CLaD 2014). The topic of the positive role that landscape, in its comprehensive sense, can play in enhancing the integration process of newly arrived residents is an arena for development. Further to the 2015 conference and forthcoming book on defining landscape democracy, CLaD has taken on to pursue this subject; this paper is an invitation for landscape architecture practitioners and scholars to engage with this topic in education and research and share this knowledge with the assistance of CLaD.

References

- Armstrong, H., 2004. Making the Unfamiliar Familiar: Research Journeys towards Understanding Migration and Place. *Landscape Research*, 29, 237-260.
- Buijs, A.E., Elands, B.H.M., & Langers, F., 2009. No wilderness for immigrants: cultural differences in images of nature and landscape preferences. *Landscape and Urban Planning*, 3, 113-123.
- Byrne, J., Wolch, J., 2009. Nature, race, and parks: past research and future directions for geographic research, *Progress in Human Geography*, 33, 6, 743-765.
- Castiglioni, B., De Nardi, A., & Dalla Zuanna, G., 2015. Landscape perception as a marker of immigrant children’s integration. An explorative study in the Veneto region (Northeast Italy). In: D. Bruns, O. Kühne, A. Schönwald, & T. Simone (Eds.), *Landscape Culture - Culturing Landscapes. The differentiated construction of Landscapes*, Wiesbaden: Springer, 207-221.
- CLaD, 2014. www.nmbu.no/clad
- Egoz, S., Makhzoumi, J. & Pungetti, G., 2011. The right to landscape: an introduction. In: S. Egoz, J. Makhzoumi, & G. Pungetti (Eds.), *The Right to Landscape. Contesting Landscape and Human Rights*, Farnham: Ashgate, 1-20.
- Egoz, S., 2013. *Landscape and Identity: Beyond A Geography of One Place*, In: Howard, P.; Thompson, I.; Waterton, E. (Eds), *Routledge Companion to Landscape Studies*, London: Routledge, 272-285.
- ELC, 2000. www.coe.int/en/web/landscape/home
- Höglhammer, A., Muhar, A., & Schuppenlehner, T. 2015. Outdoor recreation of Turkish immigrants in the Wienerwald Biosphere Park, Austria: A stakeholder process to identify research questions. In: D. Bruns, O. Kühne, A. Schönwald, & T. Simone (Eds.), *Landscape Culture - Culturing Landscapes. The differentiated construction of Landscapes*, Wiesbaden: Springer, 129-139.
- Rishbeth, C. (2001). Ethnic Minority groups and the design of public open space: an inclusive landscape? *Landscape Research* 26(4), 351-366.
- Rishbeth, C., and Finney, N. (2006). Novelty and nostalgia in urban greenspace: refugee perspectives, *Tijdschrift voor Economische en Sociale Geografie*, 97, 281-295.
- Rishbeth, C., and Powell, M. (2013). Place Attachment and Memory: Landscapes of Belonging as Experienced Post-migration, *Landscape Research*, 38, 160-178.
- Rishbeth, C. (2016). *Landscape experience and migration: Superdiversity and significance of urban public space*, Unpublished PhD., Sheffield: University of Sheffield.

Connecting Brescia's Urban Sprawl: The 'Park of Pits' Case

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urban-sprawl planning strategies | recreational and ecological corridor |
citizens participation | well-being and reclamation

Bridging the gap between the idea of landscape and the real claim of a land is not always simple and directly applicable. This is the case of sand pits in Brescia, not only holes in the ground but a barrier wounding nature and landscape. The paper illustrates the results of a Series of Participated Workshops led in 2014-2015, which involved the City Planning Department, 32 Brescia institutions and associations, 242 individuals, and the authors. These workshops were useful to trace a strategy for the reclaiming of 600 hectares of wetlands and artificial lakes - former sand and gravel pits situated between a larger sprawl expansion area of the town - which after decades of presence on the city territory, have become part of the Brescia's landscape. At the moment, this large area represents a great solution of continuity in the ecological corridor that surrounds Brescia, not allowing the basis for the correct development of a natural habitat hosting biodiversity, and blocking the completion of town outskirts greenway. These proposals are intended as a mainframe for the creation of the new Park of Pits as a public-private management supporting a common sustainable vision for Brescia and its territory. The conclusions try to show the difficulties to exceed the boundaries between architecture-urbanism based politics, inter- and trans-disciplinary and cross-cultural based design methods.

Introduction

The paper focuses on the planning strategy acted for the '*Parco delle Cave*' (Park of Pits) in Brescia (Lombardy, Italy): a participated project, begun in 2010 thanks to the insights offered by a master's degree thesis, that in February 2016 led to the approval of the variation to Plan of Government of the Territory of the City of Brescia. The authors at the time - supervisor and author of the thesis '*Park of Pits: new landscapes from protest to proposal*' have gradually followed the different stages of approach to the proposed variant through a real multidisciplinary action. This research indicates the '*Parco delle Cave*' (Park of Pits) as the necessary ring to complete the Brescia Green Belt including the '*Parco delle Colline di Brescia*' (Brescia Hills Park), the linear park of the River Mella, and a strong vegetal system along the South Brescia highway.

The Green Network of Brescia

Dominated by the alternation of full and empty spaces, as said by Leonardo Benevolo in the '70s, Greater Brescia imposed to its surrounding territory its massive development though dispersion and densification, making real an approach devoted to a never-ending territorial consumption. The first attempts to imagine an appropriate tool to limit this trend have been the construction of the green belt of Brescia. The first step has been the Hills Park. The second step has been the establishment of a first green corridor between the River Mella and the Western ring road, called the *Parco del Mella*. This green belt, even with its problems of preservation and conservation, is now half set up considering the arc formed by the Hills Park and the axis of the Mella Park. All of these factors, combined with the lack of a strategic plan, call for a necessary strong discontinuity with the past planning practice to find new elements able to regenerate the Green Network of Brescia. *Parco delle Cave* (Park of Pits), even if it is only a link between the Green Belt of Brescia and the Provincial Ecological Network, should become



FIGURE 1. The green belt of Brescia. From top left clockwise: The River Mella Park, Hills Park, Park of Pits, and Agricultural Park of Borgosatollo. The green network surrounds the Brescia's historic centre. (PGT of Brescia 2012)

for Brescia and its territory, the strategic hub for building and experimenting future planning policies.

The Park of Pits

The *Parco delle Cave* (Park of Pits) has been defined by the Brescia Urban Master Plan in 2011 and covers 450 hectares of its communal territory. Taking count of the territorial continuity and the presence of others pits in some neighbouring commons, the surface of the park could also include part of the territories of the commons of Borgosatollo, Castenedolo, Rezzato, and Botticino reaching the size of approximately 600 hectares.

After 50 years of sand and gravel excavations what remains in inheritance are 9 major lakes in the size between 10 and 20 hectares each, and other lakes and ponds of smaller size. These water basins consist of ground water at a constant temperature between 10°C and 12°C situated about 10 m below the ground level thus forming veritable wildlife sanctuaries, where several species of resident and migratory birds live. Data from recent sightings talk about 39 different species of which 30 are breeding and therefore closely related to the habitat of these former sand quarries. Found among these was the presence of 9 species with conservation priorities of which the European Birds Directive 09/147 protects 3. Because of the division of property typical of the quarry system, the basins are separated from each other by roads and watercourses. Exploitation evinces the landscape but it has respected the original agricultural structure of this territory and for these reasons, the pits have regular shapes. The liquid component is around a quarter of the total of 450 to 600 hectares of the park surface,

while the other three quarters are made up of farmland, roads and buffer zones of infrastructure and industries.

Common Construction of the Programme

The participatory design process '*Segni sull'acqua*' (Signs on water) held in 2014-2015 at the Brescia Urban Centre put a milestone in the planning process of the Park of Pits. The challenge of the process was to divide the desiderata from the real propositions to give both a correct answer.

Involving the stakeholders, the participatory process "Signs on water" was an experimental programme, which made use of a series of traditional and tentative methodologies. The Participated Workshops Series led in 2014 by the City of Brescia's Urban Centre with Imbrò and Staro Associates (architects C. Imbrò and S. Staro, assisted by arch. G. Granello) which involved also the City Planning Department, 32 Brescia institutions and associations, and 242 individuals (45 participants per meeting in average). The Board of the process divided it into three main phases:

- a *preliminary analysis* (past documentation collection; construction of a shared multidisciplinary analysis and of a 'desiderata' notebook; a technical comparison with the municipal technical departments to check the actual trends of large area projects);
- a *brainstorming phase* (using the Easy Awareness Scenario Workshop method; critical issues and of environmental resources analysis, weighted according to indexes based on landscapes, health, water, air, biodiversity, social relations, and land use); design workshops phase for the formation of the perimeter of the new park and the definition of routes



FIGURE 2. Park of Pits: Results of the participated design workshop – Plan of the possible activities. (Redesigned by G. Granello 2015)



FIGURE 3. Participation process: Sketches done during workshops activities at the Brescia Urban Center. (Picture by LMF. Fabris)



FIGURE 4. Participation process: leisure activities in the new Park of Pits. (Picture by G. Granello)

and access systems (information seminars, inspections on areas with help of experts and professionals, creation of guidelines about the vocation of the park areas, and a brief for the recovery of the entire area of the quarries);

- *a final process verification and re-modulation phase* done according to the territorial government instruments and the necessities of an executive project. During all these phases an interdepartmental technical committee has been opened and the City of Brescia Commission of Built and Landscape Environment elaborated the impact assessment analysis, taking count also of the feedback of the private stakeholders.

The results of this work have been presented to the involved associations during neighbourhoods' public meetings and in an exhibition that took place at the Urban Centre in Brescia.

Conclusion

In 2015, after this participatory design process, the Brescia Administration decided to not create a real new PLIS (Lombardy Law 86/1983 delegates to municipalities the establishment of the PLIS '*Parco Locale di Interesse Sovracomunale*' - it can be translated as 'Local Park Interesting More Cities'), but just to enlarge the borders of the existing parks, creating a real green system. This reconfigured PLIS, unifying the Park of the Hills and the Park of Pits, is a challenge because of the mixed vocation of the two territories. If well managed, this new PLIS could be an example for the regional policy that always considers valleys and hills like two very different systems. These locations can be recovered as new public spaces for the Third millennium, creating new habitats and biodiversity, promoting a new challenge for the future. This is a possible scenario for this kind of new 'accepted' re-naturalized landscape, perfectly hosted in the system of the regional Alps and Pre-Alps Park, whose reuse can become a model for other similar cases where the actions of industry left wounds into Nature.

References

- Benevolo L., (1976), *Brescia S. Polo: un quartiere di iniziativa pubblica* (Brescia S. Polo, a public initiative quarter), Morcelliana, Brescia.
- Fabris, LMF. (2009), *Tecnonatura, progetti per la rivoluzione ambientale* (Technonature, projects for an environmental revolution), Santarcangelo di Romagna, Maggioli Editore.
- Fabris LMF., Granello G. (2015), 'Mogućnosti poslijeindustrijskog krajolika strategije za održivi razvoj grada Brescia, Lombardija', Proceedings of the International Scientific Conference Cultural Heritage – Possibilities For Spatial And Economic Development, Zagreb (HR), 22-23 October 2015, University of Zagreb - Faculty of Architecture.
- Matteotti, M., Tedeschi, M. (2003), *Brescia il Piano e i progetti, materiali e documenti sulle trasformazioni urbane*, (Brescia the Master Plan and the projects: materials and documents on urban transformations), Brescia, Edizioni Grafo.
- VV.AA. (2005), *LOTO – Landscape Opportunities, La gestione paesistica delle trasformazioni territoriali: linee guida e casi pilota*, (Landscape opportunities, The land management of the territorial transformation: guide lines and examples), Land and Urban Direction of Lombardy Region.
- (Website 1) <http://www.comune.brescia.it/news/2014/settembre/Pagine/Progetto-Cave.aspx>
- (Website 2) http://www.comune.brescia.it/servizi/urbancenter/Pagine/UC_AT_030-Segni%20acqua.aspx

Planning for Biodiversity in Public Gardens and Squares: Two Cases in Porto, Portugal

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public green spaces | urban biodiversity | urban habitats | permeability

Two public green spaces in Porto were analysed regarding the relation between spatial features and urban biodiversity. Our objective was to identify which design options influence biodiversity in similar sized public green spaces, a garden and a square. For each of the study areas, permeability and vegetation cover was assessed; habitats were mapped and classified according to UrHBA methodology. Fauna and flora surveys were also conducted. The main differences between the two spaces relate to permeability and habitat diversity, both higher in the garden. As expected, the garden reveals higher species richness, both of plants and animals (mainly butterflies and bird species characteristic of woodland and complex landscapes). The square revealed a simpler design, grounded on fewer plant species and with poorer fauna communities, mainly composed of resilient generalist species. These results help to bridge the gap between nature conservation and planning decisions at municipal level, with relevant impact on the performance of ecosystems on smaller public green spaces.

Introduction

In an urban context, biodiversity depends largely on urban green spaces. Different configurations and contents of such spaces influence the functioning of these ecosystems (Smith et al. 2005). Public green spaces are pivotal, as they combine the support of biodiversity with human enjoyment. Although planning and management options of public green spaces have a direct influence on biodiversity levels, most urban biodiversity research focuses on a large-scale approach, usually considering urbanization gradients or land-use classes (Farinha-Marques et al. 2011), making conservation measures harder to implement.

Our objective is to identify which design and planning options influence the biodiversity content in similar sized urban green spaces with different design and composition.

Study Area and Methods

The city of Porto is located in the Atlantic coast of Northern Portugal, at the mouth of Douro River. Its privileged location, habitat multiplicity and mild and humid climate create unique opportunities for biodiversity occurrence.

Two public green spaces, with similar dimension, were selected as case studies for an exploratory analysis of the influence of design in biodiversity levels. Fundação Engenheiro António de Almeida Garden (FEAA Garden) was created in the 1930's as a private garden of a wealthy family, following a traditional design, intending to show a vast diversity of plants. Nowadays, it is home of a cultural foundation and it is heavily maintained in order to preserve its historical and natural assets; although open to the public, the garden experiences a reduced use by citizens. Dr. Francisco Sá Carneiro Square (DFSC Square) emerged in the late 1940's as the result of urbanization processes, occupying previous agricultural fields. Its layout follows a simple geometric style, fitted for an intense use and low maintenance levels.

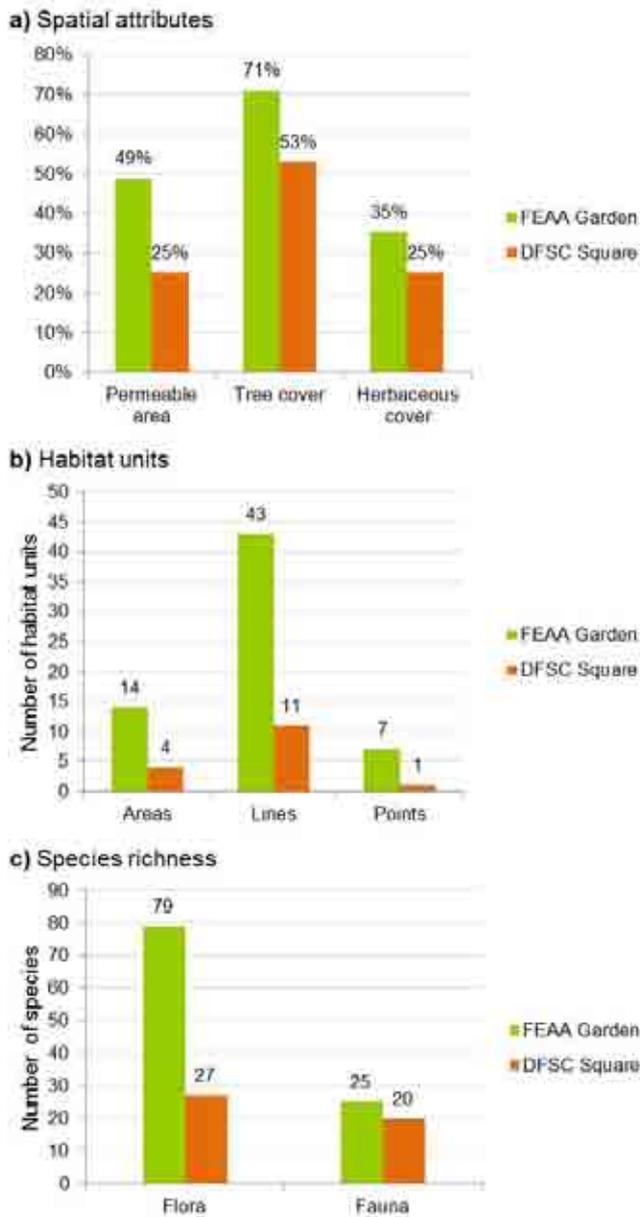


FIGURE 1. a) Percentage of permeable area, tree cover and herbaceous cover in each space; b) number and morphology of habitat units in each space; c) species richness of flora and fauna in each space.

For each of the study areas, the spatial structure, in terms of permeability and vegetation cover, was assessed. The increase of impermeable surfaces is strongly linked to urbanization processes, where the soil is covered by impervious materials and the connection of natural soil with other ecosystem components is compromised, and it is associated with reduced biodiversity (Scalenghe and Marsan 2009). Higher vegetation cover increases opportunities for a larger number of plant and animal species and the complexity of the vegetation structure also affects biodiversity (Garden et al. 2007). Permeable surface and vegetation cover (including tree and herbaceous layers) were measured in CAD software.

Habitats were evaluated using UrHBA methodology (Farinha-Marques et al. 2015). Each habitat unit is classified according to its shape (area, line or point), Urban Habitat Category (based on dominant land cover and plant life forms), Site Descriptor and Vegetation Layers.

Species richness was measured for six groups: vascular plants (vegetation plots); butterflies (transects); birds (point-counts); reptiles (transects); amphibians (transects); and small mammals (live-trapping).

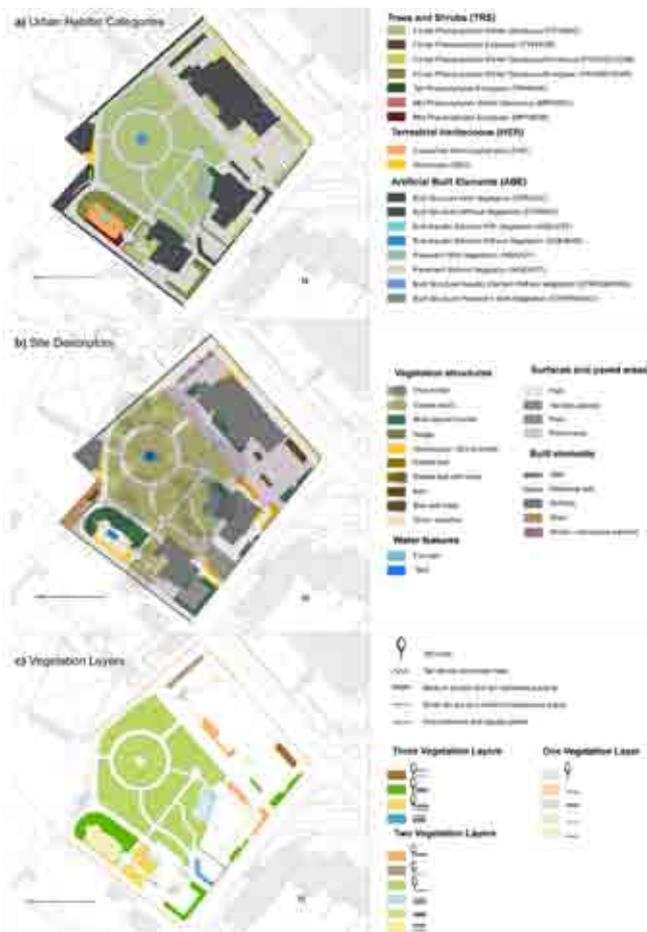


FIGURE 2. FEAA Garden: a) Urban Habitat Categories; b) Site Descriptors; c) Vegetation Layers.

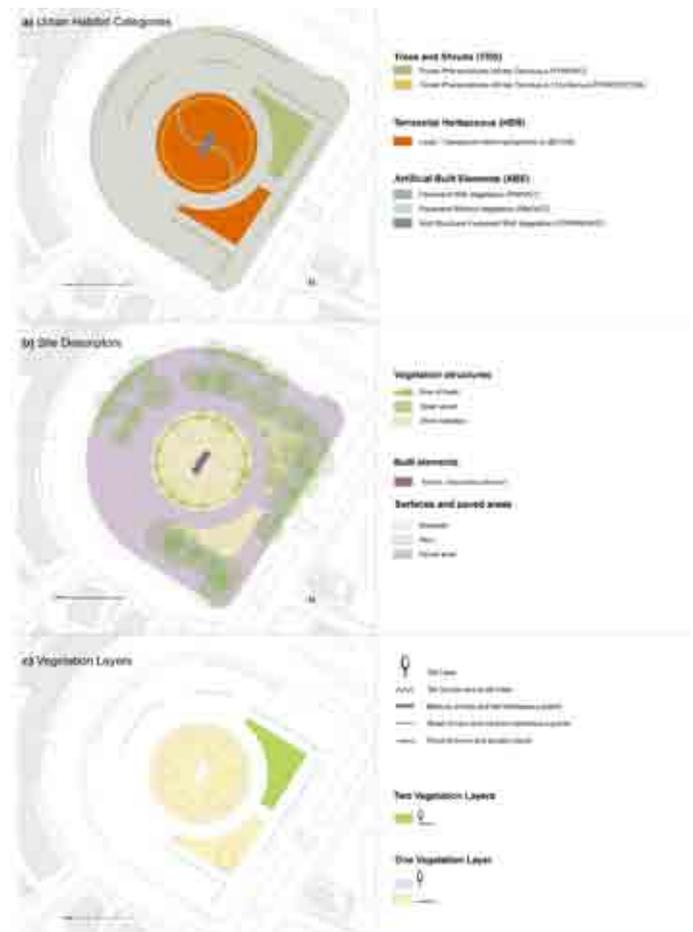


FIGURE 3. DFSC Square: a) Urban Habitat Categories; b) Site Descriptors; c) Vegetation Layers.

Results and Discussion

The garden and the square vary especially in the degree of permeability and vegetation cover, the garden presenting higher values for both (Figure 1.a). Despite having a similar area (FEAA Garden is 1.4ha, while DFSC Square is 1.6ha), these spaces show a very different habitat diversity and composition (Figures 2 and 3). FEAA Garden is organized in 64 habitat units and DFSC Square has 16 habitat units (Figure 1.b). Regarding its diversity, FEAA Garden reveals 17 Urban Habitat Categories (Figure 2.a), while DFSC Square exhibits only 6 Urban Habitat Categories (Figure 3.a). Site Descriptors show a similar situation (Figures 2.b and 3.b), with the garden revealing a much higher diversity (22 Site Descriptors) than the square (7 Site Descriptors). As to the structure of the vegetation (Figures 2.c and 3.c), DFSC Square proved to be a much simpler space than FEAA Garden.

Flora and fauna surveys detected 79 plant species, 16 bird species and 9 butterfly species in FEAA Garden. In DFSC Square, the presence of 27 plant species, 16 bird species and 4 butterfly species was revealed (Figure 1.c). Amphibians, reptiles and small mammals were not detected in any of the locations.

Higher permeability means a larger surface available for the plantation and establishment of a greater number of plants. As expected, the higher permeability and habitat diversity of FEAA Garden resulted in a higher species richness of plants.

The origin of both spaces is also reflected in its habitat richness and floristic diversity. FEAA Garden features a complex organization, translated in varied Urban Habitat Categories and Site Descriptors, with a diverse assortment of vegetation layers. Most of the space is occupied by a diverse closed wood, with several specimens of ornamental trees and shrubs (e.g. *Fagus sylvatica*, *Liquidambar styraciflua*, *Camellia spp.*). DFSC Square relies on rows of trees (*Quercus rubra*, *Magnolia x soulangeana*, *Chamaecyparis lawsoniana*) to organize the space and complement geometric meadows ornamented by annual flowers.

The rich habitat diversity and plant diversity of FEAA Garden seem to attract a number of butterfly species (e.g. *Gonepteryx rhamni*, *Vanessa cardui*), while in DFSC Square only a few species of butterfly were detected, more common and usually associated with disturbed land (e.g. *Pieris brassicae*).

The same number of bird species was recorded in both spaces, although species composition was different. The bird community of FEAA Garden was clearly dominated by species of woodlands and complex landscapes (e.g. *Garrulus glandarius*). In DFSC Square, the abundance of built surfaces gives opportunity for the occurrence of several species associated with areas of sparse vegetation and rocky habitats (e.g. *Phoenicurus ochruros*), whereas the presence of mature trees is also inviting for some woodland species (Larondelle

and Haase 2013). It should be noted, however, that most occurrences of bird species in DFSC Square are of generalist opportunistic species (e.g. *Columba livia*), which are quite common in the urban matrix, whilst FEAA Garden seems to act like a refuge for woodland specialists.

Conclusion and Guidelines for Green Space Planning

This project aims to bridge the gap between nature conservation and planning decisions at municipal level. Planning and design options have a relevant impact on the performance of ecosystem services on smaller public green spaces, particularly on biodiversity richness.

Our results show that even smaller green spaces amongst the urban fabric can harbour interesting levels of plant and animal species. A spatially-rich design and organization of urban green spaces, with high soil permeability, promotes multiple opportunities for vegetation layers and habitats, fostering high levels of biodiversity.

The results of our study led to the development of the following guidelines for the design and planning of green spaces:

1. maximize permeable surfaces;
2. develop a complex vegetation structure, ensuring a multitude of Urban Habitat Categories;
3. diversify habitat functions and forms, translated as different Site Descriptors;
4. maximize vegetation layers and their arrangement;
5. preserve existing vegetation, particularly large mature trees.

References

- Farinha-Marques, P., Lameiras, J. M., Fernandes, C., Silva, S., Guilherme, F., 2011. Urban biodiversity: a review of current concepts and contributions to multidisciplinary approaches. *Innovation: The European Journal of Social Science Research*, 24(3), 247-271.
- Farinha-Marques, P., Fernandes, C., Lameiras, J.M., Guilherme, F. 2014. Urban green structure in the city of Porto: Morphology and biodiversity. In Silva, I.M, Marques, T.P, Andrade, G. ECLAS Conference Porto 2014. *Landscape: A Place of Cultivation*. Book of Proceedings. Porto: School of Sciences, University of Porto.
- Farinha-Marques, P., Fernandes, C., Guilherme, F., Lameiras, J. M., Alves, P., Bunce, R., 2015. Morphology and biodiversity in the urban green spaces of the city of Porto. Book II – Habitat mapping and characterization. Porto: CIBIO.
- Garden, J. G., McAlpine, C. A., Possingham, H. P., Jones, D. N., 2007. Habitat structure is more important than vegetation composition for local-level management of native terrestrial reptile and small mammal species living in urban remnants: a case study from Brisbane, Australia. *Austral ecology*, 32, 669-685.
- Larondelle, N., Haase, D., 2013. Urban ecosystem services assessment along a rural–urban gradient: A cross-analysis of European cities. *Ecological Indicators*, 29, 179-190.
- Scalenghe, R., Marsan, F. A., 2009. The anthropogenic sealing of soils in urban areas. *Landscape and Urban Planning*, 90, 1-10.
- Smith, R. M., Gaston, K. J., Warren, P. H., & Thompson, K. 2005. Urban domestic gardens (V): relationship between landcover composition, housing and landscape. *Landscape Ecology*, 20, 235-253.

Ecolecce. Landscape as Urban Development

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landscape | urbanism | processes | shared | planning

Ecolecce is the research project that has been setting basis for the new Urban Plan of Lecce, its values and implementation strategies. Ecolecce aims to reverse conventional rules based on zoning and peripheral expansion in order to generate development independently from urban growth, linking it to the city's deepest values: landscape, tourism, and the quality of life. Ecolecce sets a series of social and ecological objectives pursuing the sustainability of the city's process of transformation. The ecological challenge, the reduction of urban waste, the reuse and recycle of urban material are the main strategies on which the new urban plan is based; implemented through a series of tactics that will allow individual, enterprises and communities to be active actors of the urban requalification. This paper presents the result of Ecolecce highlighting the relevance of a landscape approach in determining territorial values, outlining ecological infrastructure, and tracing a framework through which future transformations of the city can be evaluated and implemented.

In Lecce, like in many other cities of Southern Italy, the building boom of the 1980s supported the shift from an agriculture-based economy to an urban development land-value-based income. In fact, the expansion of Lecce beyond its Baroque walls dates back to late Nineteenth century, reinforced by the development of the construction industry that by the mid of the XIX century had become the first economic driving force of the city. The 1983 Urban Plan of Lecce defined the “zones” for a new expansion towards the periphery, tracing a new suburban ring that would contain this expansion and create new centralities for later development plans. Something very similar to what Cedric Price had defined the model of a “city as fried egg”: a hard core, a yolk, surrounded by a (possibly) never ending series of concentric rings driving the urban expansion towards the edges (Ricci 2010: 59). However, this model ceased to work in the 2000s, as it became evident that the land-value based economic model, did not correspond to the real economy of the territory and its inhabitants' activities.

The new Urban Plan of Lecce, to be approved in 2016, aims to reverse the conventional rules based on zoning and peripheral expansion creating a plan that is instead based on the city's deepest values: landscape, tourism, and quality of life. Based on the thematic landscapes of the city and its qualitative objectives, rather than on its form, the new plan would be valid independently from the physical growth of the Lecce.

Ecolecce is the name of the research project, coordinated since 2010 by Mosè Ricci and Luigi Maniglio, that has been setting the bases for the New Urban Plan. Ecolecce is also the concept-manifesto of the plan, through which the social and ecological objectives, and the implementation strategies, that would improve the overall quality of life in Lecce and the sustainability of its urban processes are being defined. The project is based



FIGURE 1. Lecce, view from the centre towards the coast.



FIGURE 2. Diagrams representing the new structural plan for Lecce, in contraposition to traditional peripheral expansion, and to be implemented by projects.

on main interrelated goals: Thematic Landscapes, Zero Land Consumption, and Devices for Urban Metabolism.

Thematic Landscapes

One of the first objective of the research project has been to break the “city as fried egg” model, and think of a “constellation” of resources and values that could change over time but remain identified by their configuration. This has led to the identification of five main themes, defined by their landscape characteristics and historical and social connotation: “The Walls of Lecce”, “University and the City”, “The Islands for Living”, “The Rural City”, and “The Marine Park.” These are the themes that connect different urban conditions - historical, compact, sprawl, cost city - to the lifestyles and landscapes that characterize the city of Lecce (see Viganò 2001 and Magnaghi, Mininni 2015). These themes also identify the fields of interventions and set the framework for defining the transformation strategies, mainly based on the reinterpretation and reactivation of the existing patrimony.

Zero Land Consumption

Another fundamental paradigm that will lead the construction of the new plan, is the “zero land consumption”: the strategies proposed for implementing the urban development are based on the requalification of what has been built, the reinforcement of the connection to the coast and through the countryside, the improvement and consolidation of the built environment, the upgrading of historical farms, and the introduction of ecological and sustainable models of living, such as the transformation of the degraded peripheries into eco-districts.

Devices for Urban Metabolism

The concept of urban metabolism aims to focus on the real necessities of the city, its inhabitants and visitors; reconnecting the agricultural, residential, industrial, natural, cultural and recreational systems and promoting a new adaptable organization of the built environment according to these needs. The new Urban Plan will encourage flexible uses and functional reorganization of the existing building stock in order to accommodate this flux of people, and resources, in exchange of a contribution in the recalibration of public services. In the same way, it individuates and regulates flexible

ways of inhabiting the countryside. The Urban Plan devices will thus define actions at the landscape-territorial scale - mostly based on landscape compensation strategies - and the urban-architectonic scale, which includes the requalification and upgrading the existing buildings but also the implementation of local services in order to improve urban quality.

In particular, the Devices for Urban Metabolism include the following operative tools:

- “Lecce Protocol” reassembles a series of strategies promoting and forecasting energetically and environmentally sustainable design solutions, also compatible with historical buildings. These measures allow to increase individual units by adding volumes, arcades, greenhouses and energy devices in order to improve the performance of buildings and the use of alternative energy sources.
- “Lecce Brand” identifies and rewards (with taxes deductions) the constructions built in respect to the local tradition, such as the re-introduction of the architectonic traditional construction processes and materials, as for example the use of the local white (“leccisu”).
- “Re-Cycle” is a device that guides the transformations of existing buildings requiring the maintenance of at least the 75% of the volume or figure. Projects must describe the transformation through specific technical drawings and context fitting, encouraging continuity or clear abstraction.
- “Temporary reuse” encourages individual and collective re-appropriation and re-activation of obsolete places and buildings by promoting a social aggregation and/or productivity through the physical reorganization of the spaces. For example, vacant lots, and abandoned and decommissioned areas for collective uses, can be temporary reused as recreational and cultural centres and productive landscapes (community gardens, urban gardens, soft water treatment infrastructure, etc).
- “Eco-district” describes a social and urban reality in which local communities work together to develop a system of ecological harmony with the environment through the efficient use of resources and the organization of the



FIGURE 3. The five themes of Lecce and implementation tactics.

collection and disposal of waste material in order to reduce their neighbourhoods environmental impact and energy consumption. The creation of Eco-districts is a device and an objective for the new Urban Plan.

- “Sine Putimu” - the translation of the “Yes we can” to the local dialect - allows a participatory and shared process of the Urban Plan’s design, ensuring the continuous update of the Plan in accordance to the people requirements. “Sine Putimu” is a call for projects that will be launched by the Municipality and the Office for the Urban Plan of Lecce every two years and through which public-private companies, associations, individuals, designers can propose projects and actions to be included in the apparatus of the Plan.

From Land-use to Landscape: Towards a Shared Plan

Ecolecce aims to innovate urban planning instruments by defining them through the recycle paradigm. The new plan is indeed proposing guidelines and operations that allow to intervene on the built environment – transforming and upgrading it according to the needs of the city. And the planning rules are modified in a way that this can happen at any scale - involving all the actors to play an active role in the process of change: citizens, professionals, land owners, companies, and public institution.

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References

DPP Lecce, 2012. Documento Programmatico Preliminare al Piano

Urbanistico Generale, Comune di Lecce.

Magnaghi, A. and Mininni, M.V., 2015. Relazione Generale Piano Paesaggistico Territoriale, Puglia.

Ricci, M., 2012. New Paradigms, List Lab, Trento.

Sordi, J., 2014. Beyond Urbanism, List Lab, Trento.

Trono, A., 1997. Lecce Cambiamenti Sociali e Sviluppo Urbano, Conte Edizioni, Lecce.

Viganò, P., 2001. Territori della Nuova Modernità. Il Piano Territoriale di Lecce, Electa, Napoli.

Highlighting Landscape Events in the Way of Saint James: Rapperswil and Puente Villarente

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way of saint james | cultural landscape |
walking landscapes | compressed landscape

The Way of Saint James, declared its stretch in northern Spain as a World Heritage Site by UNESCO since 1993 (Reference: 669bis), it is one of the most important cultural pilgrimage routes of the Christian world. Throughout its complex evolution, it has become a catalyst for landscapes and times which give it different meanings that can be read in deferential ways: mystical, narrative, aesthetic, etc. Landscapes of great intense value are present along the route that need to be empowered through subtle but effective actions to make them visible. This potential precise an energetic action but endowed with aesthetic sensitivity and legitimized by the knowledge of all its complexity.

These special areas are use to be detected near distinguishing elements in the way that have made complex the evolution of their landscape, like it happens with the presence of obstacles to save. Two distant case studies are analyzed in the Way of Saint James: The footbridge between Rapperswil and Hurden (Switzerland) and the footbridge in Puente Villarente (Spain). In both cases, the introduction of a new infrastructure for crossing lake and river respectively is intentionally used as a landscape strategy to extract, display and explain the meaning of their environment characterized by the presence of water.

Overcoming Obstacles

“The bridge is light and strong tend above the current. It carries the current and the two extensions landscape that are behind the banks to mutual neighbourhood: gathers the earth as landscape around the stream” (Heidegger,1951).

Building bridges is needed to overcome the obstacles of the way. These brave and helpful infrastructures transform the place and turn it strategic, becoming the tool to sprout the intensity of a particular landscape.

Overcoming Obstacles in Rapperswil

The landscape of Rapperswil sits on the pilgrimage path that has been involved in a mutable landscape known to be inhabited since prehistoric times. The walkway, of medieval origin, was historically due to two needs: for trade and for pilgrimage towards Einsiedeln Abbey, the nearest sanctuary on the Way to Santiago de Compostela. The disappearance of the footbridge was a result of the construction of a dam for a railway and vehicles (1878). As traffic increased, the dam became inappropriate for pedestrians because of the danger and the high level of noise and pollution.

The construction of a new footbridge in its original place restored one of the most important functional and historical line connections, as it was demanded by society, as well as this it returned the original access to the small Heilig Hüsli chapel (1551). The architect Reto Zindel, author of the design said: "the way is the purpose" according to a proverb, but he preferred to think that "the road is the place", because it joins what is close and what is far away, reflections of man on their origin and destiny (Zindel 2010). The strategy regains the scale of man in a place where rail and road have become the only players elements. (Figure 1)

The road, as a place over the water.

“The essence of the project is not the union of the two banks, but the place itself, walking over a calm body of water, it becomes a fundamental experience based on immediate sensory perception.” (Zindel 2010)

The walkway is designed as a segment of the road that runs and breaks at the mercy of natural and landscape factors. The project aims firstly to recover in a contemporary key, a tour of abstraction with a strong mystical component emphasizing the sensory qualities of the place. The pedestrian is immersed in a complete experience of pilgrimage that takes place along the 841 meters walking across a line in permanent contact with the lake, few meters over the surface, inducing the user the illusory and utopian feeling of "walking on water". The gateway not only connects the two banks but as Walter Zschokke says: it does the same between water and sky. In this sense, the succession of pillars that shape the walkway make us a rhythm of travel, a cadence that describes the sequence of elements and accompanying the idea of an individual who goes through a particular stretch at a particular time but is immersed during its route in a timeless experience.

The Experience of Crossing the Landscape of Lake Zurich

The new walkway, articulated through a broken axis that sometimes shows us directions and others not, retrieve the direct and irreplaceable contact between man and the landscape he had lost. It makes it possible to walk and discover the path as you move through the centre of one of the most beautiful lakes in Switzerland, located at the foot of the Swiss Pre-Alps, understanding two of the most important signs of identity of Switzerland: the mountain and glacier lake.

The footbridge works as a tool that provides a complete reading of context. From north to south in its first perpendicular contact with the lake it focuses on the presence of the dam, its conceptual heir. It is the symbol of communication and travel and describes a contemporary horizon line with an incessant flow very attractive in the middle distance. After the first break, the walkway introduces you into a journey through time, starting with its medieval existence through the connection to Heilig Hüsli chapel, the only surviving witness. The path at this site is closed to the inner island established for the protection of native birds, while open to the lake coinciding with the place of the underwater prehistoric stilt remains, and part of a set declared World Heritage Site by UNESCO in 2013. The rest of the tour continues with a view of the lake, unchanging over time, which gradually brings us back to our tour into the present. (Figure 2)

Overcoming Obstacles in Puente Villarente

The landscape of Puente Villarente sits on an important route of communication that dates at least to Roman times (Lancia - Legio VII Gemina), consolidated during medieval times because of its coincidence with the Way of Saint James. A large medieval bridge has historically saved all types of traffic over the River Porma and its wide bank of remarkable natural wealth. However, the pedestrian way across the river had become impossible mainly because of the dangerousness of going across the narrow bridge.

The new walkway retrieves the connection in a mismatched mode. Pedestrians descend to the river to value the presence of the medieval construction as the protagonist in the valley landscape composition.

The broken axis of the footbridge crosses the river bank between trees and is designed as an abstract element placed downstream at a lower level than the bridge. The walkway point of view returns its truly scale to the bridge and also to the valley as a measure instrument. (Figure 3)

The Road as a Place Over the Torrent

On leaving the road and walking down towards the river, the pilgrim moves away from reality and towards time suspended over the river, evoking all the memories of the place. (Álvarez et al. 2010, 100)

As it happens with the Rapperswil case study, a tour of abstraction is set out with a strong mystical component emphasized by the sensory qualities of the place. The path descends into the valley through the filter trees of the bank of the river that contribute to the beginning of a progressive abstraction exercise. The road and the new gateway is integrated into a path that runs and breaks at the mercy of natural landscape factors. Condensed intensity factors in a path section contributes to the feeling of living a synecdoche, in which each part of the road for the above deals with the whole, and in turn, the whole identifies each of the parts. (Álvarez 2015, 103).

The Experience of Crossing the Landscape of the Porma River

“A footbridge has been chosen in the form of a low water crossing, an element of wood and concrete, silent and poetic.”

(Darío Álvarez 2010)

The new footbridge at Puente Villarente is designed to recover the direct and irreplaceable contact between the pilgrim and his landscape as it happened with the Swiss case study. The broken route illustrates the pilgrim as going along and discovering the following stages. The experience of the broken route surprises the pilgrim as going along and discovering the following travel elements. The road descends between riparian vegetation and takes the first stretch of the walkway having the greenery as the only horizon. After that, the path makes a break forcing the viewer to turn right to face the river and grandeur of the medieval bridge and the valley. It's the beginning of a stretch walking across a line in permanent contact with the river, few meters from the water, feeling close its freshness and sound, inducing the user the illusory and utopian feeling of "walking on water torrent". The following breaks direct pedestrians across the valley and indicate the continuation of the road to the next village and ultimately to Santiago de Compostela. (Figure 4)

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R&D National Project: Models of sustainable integration of new infrastructure in heritage, architectural and archaeological landscapes. Ministry of Economy and Competitiveness, Government of Spain. (HAR 2012-35356).

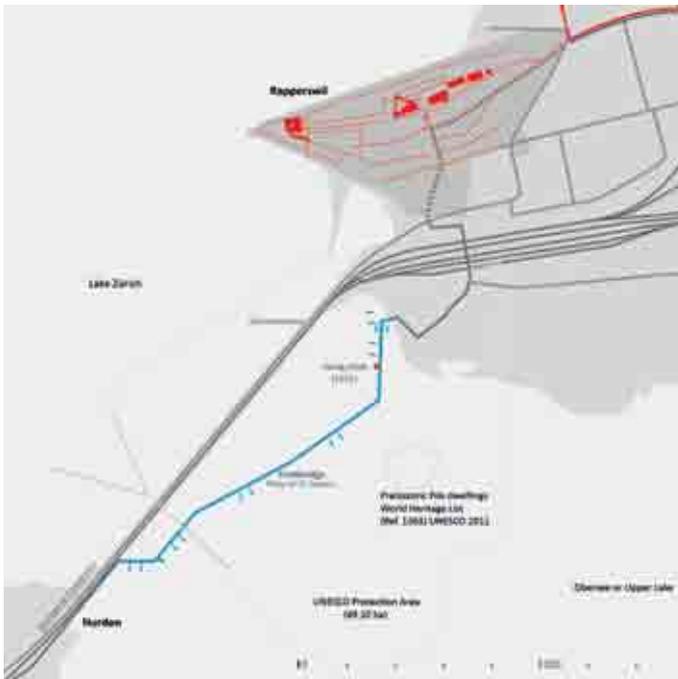


FIGURE 1. Rapperswil-Hurden footbridge plan, Lake Zürich, Switzerland.



FIGURE 3. Puente Villarente footbridge plan, León, Spain.



FIGURE 2. View of Rapperswil-Hurden footbridge, Switzerland. (Roland zh, Wikimedia Commons 2011)



FIGURE 4. Image of the footbridge at Puente Villarente, Spain. (LABPAP, 2010)

References

- Álvarez, D. Proyectar lo Intangible. Heterotopías del tiempo en tres Paisajes Patrimoniales. In: L. Francosini and C. Casadei, eds. *Architettura e Patrimonio: Progettare in un paese antico*. Roma: Mancosu, 2015, 32-43.
- Álvarez, D. et al. "Intervención en el Camino de Santiago a su paso por el río Porma en Puente Villarente." *Paisea dos. 003 España Norte*. Valencia: Paisea, 2010, 94-98.
- Heidegger, Martin. "Constñuir, Habitar, Pensar." In *Conferencias y Artículos*. Barcelona: Serbal, 1951.
- Zindel, R. In Egli, J. *Andar Per Acqua, Passerella Pedonale Rapperswil-Hurden, Costruire la Svizzera*. La cultura architettonica contemporanea raccontata alla Radiotelevisione svizzera, vol. 12. Società Svizzera di Radiodiffusione y Società Svizzera degli Ingegneri e degli Architetti, 2010.

Scattered Settlements Redevelopment of Neglected Landscapes

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scattered settlement | redevelopment | local activities |
cultural landscape | planning

The paper points out the current problems of scattered settlements in Slovakia. These types of settlements have very unique characters and therefore require specific planning approaches. Scattered settlements (mostly called “kopanice” in Slovakia) have special qualities and potential of sustainability. A very important feature is their unique natural and cultural heritage. Our research analysed the problem from different perspectives and recognized historical, mental, physical and planning gaps. The research linked by two diploma works explored the next main aspects:

- Cultural landscape conservation – values identification, setting of tools and methods,
- Local activities and “bottom-up” initiatives – alternative in planning and management.

The research findings are supported by theoretical arguments and practical experiences from two typical micro-regions in Slovakia.

Main Objectives

This paper focuses on reflecting problems of redevelopment of scattered settlements in Slovakia. These type of settlements have a very unique character and therefore require specific planning approaches. It occurs mainly in mountain and foothill areas of the western and central Slovakia and was created by agricultural colonization in 16th – 19th century. Scattered settlements arose as a result of a resource and were oriented on agriculture, pasturage, fruit growing, forestry, beekeeping and other activities as charcoal-burning, handicrafts etc. This form of land-use is reflected in the landscape shape typical by hilly character with forests, meadows, pastures, orchards and small farm holdings. “Kopanice” /kopanitse/ and other names are used for these settlements in Slovakia depending on the region. Etymology of names mostly reflects the activity (“kopanica,-e” – from “kopat” = dig), location (“laz,-y”, “samota,-y” = hamlet, “rál,-e” = outfield), function (“štál,-e” = stall, stable). To these days individual “kopanice” retain their names by original settlers.

Emigration from these poor regions at the beginning of 19th century and later the socialism period significantly affected these landscapes. Industrialization caused huge migration of young population to the cities and gradual depopulation and regression of “kopanice”. Following collectivization of agriculture and land consolidation conducted to this. Scattered settlements then began to decline and recreation almost replaced the original agricultural function. Most of former farmhouses started to be used as second houses for weekends and holidays. The recreation in these areas was almost sacred to private use. Nowadays the municipalities and local stakeholders (private owners, civic initiatives etc.) are trying to open this specific settlement and landscape structures to the broader public through region presentation, building hiking and cycle trails, supporting local traditions, broader tourist



FIGURE 1. View of Haluzice from observation tower, Bošáčka Valley. (photo: Vašš, Ľ.)



FIGURE 2. Traditional farming shaped the Bošáčka “kopanice” landscape. (photo: Vašš, Ľ.)



FIGURE 3. Typical landscape pattern in Bošáčka region - Predpolom, Nová Bošáca. (photo: Vašš, Ľ.)

accommodation structure, agro-tourism or hippotherapy practice etc.

After political changes and restitution of private property, new perspective and energy has been coming slowly back to partly abandoned “kopanice” thanks to continuators among younger residents and alternative life funds coming from towns with ambition to fill this big gap. Privatization enabled the return of private farmers and young residents, which started to revive the almost forgotten local traditions, knowledge and identity. People seeking for new living have found here new challenge and chance to live and work in close contact with nature almost independently from official structures.

Problem Statement

Although extensive academic research has explored the historical context and landscape characteristics of scattered settlements in Slovakia (Huba 1997; Omasta 2007; Thurzo 1997 et al.) much less interest was devoted for seeking problem solutions. This study aims to solve some specific gaps in theory and practice. Essentially our research responds to the demand for new thinking in the field of redevelopment of scattered settlements. This research analysed the problem from different perspectives and recognized gaps in different fields as:

- Historical (demography, economical activities)
- Mental and cultural (regress or loss of identity, traditions and skills, discontinuity)

- Social and physical (divided land, accessibility, isolation, communication)
- Planning (gaps in planning legislative, places outside of official interest)

The research challenge seen especially in:

- Bridging the gaps
- Reviving old traditions and knowledge
- Looking for new quality and diversity of living
- Contributing to sustainability and resilience of cultural landscape (sustainable land use, sustainable life, sustainable landscape)

Potentials for Redevelopment

These abandoned, neglected and almost forgotten landscapes have on the other hand a great potential for further development as themselves, as well as development of civic society and local communities. We see this potential in the reviving of traditional forms of land uses and in the introduction of alternative ones, which would contribute to the resilience of cultural landscape and could be an alternative for people’s new existence.

Independent actions by local people to find solutions and opportunities to participate in local decision-making are initiated by planning gaps and low interest of officials. However, time-consuming bureaucracy is a significant barrier for getting financial and planning support, encourage local people to



FIGURE 4. Young farmers practice the traditional skills, Bošáčka Valley. (photo: Vašš, L.)



FIGURE 5. Deforestation and uncontrolled building-up degrade the landscape in Valašská Belá region: "Lazy" at Ďurčkovci (photo: author)



FIGURE 6. Micro-region Bošáčka in relationship to Valašská Belá, Trenčín region. (studio work, UM STU 2015)

alternative activities and cooperation among the residents with similar problems. Besides traditional forms, new forms of cooperation and information sharing are used, based on social networks and communication among new civic associations and local action groups. They organize workshops, seminars, cost-free experience exchange etc. and develop and discuss alternative forms of local economy. Current unfit conditions encourage and require personal initiative, ideas and cooperation.

Authenticity and high values of these landscapes range them as the cultural and natural heritage. They represent one of the possible ways of its sustainable development. Lack of resources and past mistakes do not overshadow the original values of

these landscapes. The abandonment and low official interest saved Slovak scattered settlements only slightly affected by time. The isolation and distance can be a problem but also a benefit and a goal.

The exploitative intervention in the time of the highest colonial expansion changed the shape of original landscape and created "kopanice" as a unique type of cultural landscape. Nowadays on the other hand, it is one of the most endangered landscapes by dereliction and disutility. Redevelopment of traditional farming forms as well as support of new economic activities requires active conservation approach on behalf of the next self-sufficiency and resilience.

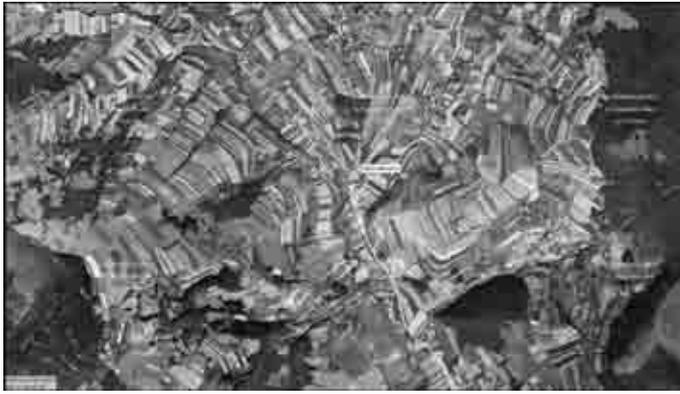


FIGURE 7. Nová Bošáca landscape structure in 1950.

FIGURE 8. Nová Bošáca landscape structure in 2010.

LANDSCAPE STRUCTURE OF BOŠÁČKA VALLEY FORMS AND INTENSITY OF LAND USE



FIGURE 9. Scheme of landscape structure of scattered settlement in Bošáčka Valley. (diploma work, ÚM STU 2016, student: Búcorová, O.)

Core Research Questions

The core research questions that guided this study can be stated as follows:

- Which ways and methods can be used in order to revive and redevelop these neglected landscapes?
- How can the local potential be used for reaching this aim?
- What new forms of governance should be evolved in the related regions?

Case Studies

Besides the theoretical research we investigated the redevelopment potential by practical application of experiences from two typical micro-regions in western Slovakia. We got an impulse directly from local people looking for an alternative way of life in “kopanice” where they are facing to a lot of gaps and barriers. Economical tradition in this region is focused mainly on fruit growing and fruit distillery, forestry, pasturing, livestock breeding and additional agricultural activities, as beekeeping, viticulture, etc.

Municipality Valašská Belá is the largest village in Slovakia thanks to the area of dispersed farms that belong to it. That is a central village with surrounding farm holdings (here called “laz,-y”), where two large agricultural companies operate in

addition to individual farmers. The village has maintained its glassmaking tradition. The civic activities are not very significant here regarding the attraction role of the local municipality centre.

The second area includes five municipalities formed along a stream in Bošáca. This region overlapping to the Moravia in Czech Republic has an old tradition of fruit distillery and a famous plum brandy („slivovitz“) is produced here. Fairly active local civic communities act here on developing their farmsteads by reflecting the old traditions. They are connected to a local association „Micro-region Bošáčka“, that allows them to act jointly on developing their projects. The civic communities and number of in-official activities started to be fairly active here after political changes and they partly substitute the role of less competent local authorities.

Collectivisation affected very significantly the landscape in both regions (change of field pattern, decrease of cultivated area, new agricultural cooperatives), what is evident by comparing the landscape structure changes on the local maps (Figures 7 & 8) from two periods (1950 and 2010).

Methodology

Based on the critical literature review and case study research linked by two diploma works, we examined particularly the historical context of scattered settlements in Slovakia as well as the potential to implement specific planning approaches in those areas. Executed field research collected and analysed the amount of data, oriented in particular on the character and problems of economic activities such as:

- Land use - production type, farm size, self-sufficiency degree (not fully reviewed in this stage of research)
- Local initiatives - forms, links, problems, alternative activities
- Planning culture – gaps, structure, multilevel governance

Conclusions

On the basis of research results main contributions were formulated as:

- Summarization and selection of relevant methods and techniques for analysing the current conditions and potential for sustainable development
- Identification of potential of economic self-sufficiency, traditional and new economy, coexistence of natives and newcomers
- Proposal of effective implementation of local self-government and civic initiatives to the model of multi-level governance, possibilities of financial support

The study opened a large area of problems and challenges which could not be fully investigated within the teaching process, therefore we created a research team intending to continue in following scientific research. Social demand for this type of research is highly acute, although the official order from the micro-regions and municipalities has not been currently requested. The conclusions of the research aim to be useful for academic community and also for practice.

References

Journal articles:

- Huba, M. , 1997. Dispersed Kopanitse Settlement, Environment and Sustainable Way of Existence, *Životné prostredie*, Vol. 31, (2), 61-66.
- Omaša, Š., 2011. Dispersed Rural Settlement – Socioeconomic and Historical Aspects. *Životné prostredie*. Vol. 45, (1), 43 – 47.
- Thurzo, I., 1997. Dispersed Settlement – a Traditional Part of our Countryside. *Životné prostredie*. Vol. 31, (2), 62-72.

Web resources:

- Historická ortofotomapa © GEODIS SLOVAKIA, s.r.o. and Historické LMS © Topografický ústav Banská Bystrica. In: <http://mapy.tuzvo.sk/HOFM/>
<http://valaskabela.sk/>

Managing Cultural Landscape Diversity: From an EU and Local Perspective

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common agricultural policy | cultural landscape diversity |
territorial impact assessment | coastal landscapes

The integration of nature conservation objectives in agricultural measures explicitly target cultural landscape preservation. These policies are conceived centrally on EU level, and are being transposed to national (and regional) legislations without much consideration of their impact on local territories. This paper discusses their impact on landscape diversity using the "territorial impact assessment" approach in six landscape units of Slovenian coastal landscapes. The results show that the expected impact differs between units: which was mainly positive in the two landscape units where either intensification or forest re-growing processes have already diminished landscape diversity. In the other four units, the expected impact is ambiguous and difficult to forecast, but may also involve negative consequences. The findings show that what may be seen as the same problem from the EU perspective is much more differentiated when observed on lower levels. The gap in between needs to be addressed by multilevel governance instruments, including landscape planning.

Introduction

Integration of policies in the horizontal and vertical dimensions has come to the front desired approaches for better governance in the EU. The integration of nature/biodiversity conservation objectives into agricultural policy measures started with the agri-environmental schemes in 1992, followed by the environmental cross-compliance in 1998. The share of the payments with environmental focus increased with each policy reform and financial perspective. These instruments are developed centrally within the Commission of the EU, and implemented by the EU legislation and financial instruments. The territorially relevant impact, e.g. on cultural landscape diversity, is rarely evaluated, especially ex-ante (Golobič and Marot 2011). The evaluation of rural development programs for the period 2007-2013 indicates that the CAP changes have not managed to provide adequate instruments to protect the high natural value of farmlands (Lomba et al. 2014).

The question of the future of cultural landscapes has specific relevance for Slovenia. High landscape diversity is among the main elements of national identity and an important tourism product. Landscape and biodiversity is maintained by traditional and extensive agriculture practices on 60-80% of the agricultural land in Slovenia (Rural... 2015), but is diminishing due to the intensification of use on the one side, and the abandonment of agricultural activities on the other (Natura... 2014; Rode 2013; Žgavec 2012). While the impact of CAP measures on cultural landscape diversity has not been explicitly measured, the low uptake of the agri-environmental measures by farmers and lack of the appropriate measures for protecting landscape features, indicate that these processes could not be slowed down (Žvikart 2010; Strokovne podlage ... 2014).



FIGURE 1. Test area: Coastal regions of Slovenia with six observed landscape units.

	Biodiversity measures of agri-environment payments	Cross-compliance	Ecological focus areas
Preservation of permanent grassland, Preservation of pastures	permanent grassland I & II; special grassland habitats; grassland habitats of butterflies; habitats characterized by steep grassy areas; bird habitats of humid extensive meadows	grasslands shall be managed (mowed/grazed) at least once per year, no later than 15. 10. of the current year.	compulsory within "Natura 2000" areas.
Preservation of traditional orchards	meadow orchards;	in Natura 2000 sites (birds) green cover in meadow orchards shall be managed at least 1x per year, no later than 15. 10. of the current year.	
Preservation of landscape features (trees, shrubs, hedges, etc.)	maintenance of hedges;	Minimum level of maintenance / the preservation of the landscape features on agricultural land (currently only for features, defined as natural values under Nature Conservation Act) existing hedgerows in Natura 2000 sites (birds) shall be trimmed and thinned only in prescribed time Buffer strips along watercourses have to be maintained.	compulsory within "Natura 2000" areas.
Preservation of landscape features (geomorphology, terraces, water bodies, boulders and solitary rocks, stone walls, etc.)		maintenance of terraces due to protection against erosion: in areas where fields have slope of 20% or more, from 15 November to 15 February at least one of the following measures has to be applied: - contour plowing - maintenance of stubble - revegetation	

TABLE 1. Agricultural policy measures which are considered to be potential drivers of landscape change.

Method

We applied the approach of territorial impact assessment (Golobic and Marot 2011; Golobic et al 2015), which is specifically developed for differentiating the impacts of centralized policies across the territorial units. This approach introduces the third dimension; i.e. territorial units, to the traditional two-dimensional impact matrix. In the impact assessment matrix (IAM), the measures of agricultural policy (Table 1) are confronted with the guidelines for landscape management (Table 2) in each specific landscape unit.

Policy measures: The analysis focuses on a selection of agricultural measures with integrated nature conservation objectives from the ongoing financial perspective (2014-2020): (1) payments of rural development programme (Rural... 2015), (2) regulations referring to direct payments (i.e.

Landscape objective	Goriška Brda	Goriška ravan	Vipavska dolina	Kras	Slovenska obala	Slovenska Istra
Preserve the small scale land-division with vineyards	X					
Plant trees around the houses (Mediterranean conifers, fruit trees)	X					
Plant trees along the main lines in landscape (roads on ridges paths, property borders, terraces) and specific (symbolic) places	X					X
Preserve forests/natural growth on steep slopes and in the cloughs	X		X			
Preserve/manage/revitalize/reconstruct orchards and vineyards	X	X	X			
Preserve the rocky outlook on Skalnica and Sveta gora slopes		X				
Preserve the natural riverbeds and the typical vegetation along the streams/revitalize regulated streams		X	X		X	X
Control the meliorations to comply with traditional landscape/revitalize meliorated agricultural areas by planting of the bushes and trees			X	X		X
Maintain animal husbandry to prevent the spontaneous reforestation and preserve typical vegetation of Karst including pastures and meadows with stone walls				X		
Preserve fields in the pothole bottoms				X		
Leave the abandoned terraces on northern/steep slopes to natural overgrowth to prevent erosion					X	X
Preserve the terraces on southern slopes with traditional "cultura mista"					X	
Preserve the natural (cliffs, coast) and cultural (saline fields) landscape					X	
Preserve the features of karstic edge						X

TABLE 2. Landscape management objectives in observed landscape units. (Marusic et al. 1998)

cross-compliance) (Decree... 2011), and (3) payments for the "ecological focus areas" (Regulation (EU) no. 1307/2013).

Landscape diversity objectives: This paper focuses on coastal regions, a sub-region of Mediterranean macroregion, which includes the following landscape units: Goriška Brda, Goriška ravan, Vipavska dolina, Kras, Slovenska obala, and Slovenska Istra (Figure 1). Mediterranean regions are considered to have the highest variability of landscape patterns of the five landscape macro-regions in Slovenia, influenced mainly by climate and bedrock, which is either limestone (Carst) or flysch (Marusic et al. 1998). This diversity is also reflected in the specific management objectives and guidelines as defined in the Regional distribution of landscape types in Slovenia (Marusic et al. 1998) (Table 2).

Land use category	Changes in landscape units (quantitative analysis)					
	Goriška Brda	Goriška ravan	Vipavska dolina	Kras	Slovenska obala	Slovenska Istra
Traditional Orchards	+	++	+	+	+	
Vineyards	-	--	-		-	
Olive Groves	+				+	+
Fields	-	-	-		-	+
Meadows	-		--	-	-	--
Forests & Overgrowing Agricult. Land			++	+		+
Built Up		+			++	

TABLE 3. Land cover changes in the observed landscape units.

Policy measures	Compliance of expected impacts in with landscape objectives for landscape units						
	Goriška Brda	Goriška ravan	Vipavska dolina	Kras	Slovenska obala	Slovenska Istra	agr
Preservation of permanent grassland	o/+	o	o/+	+	o	o/+	o/+
Preservation of pastures	o	o	o	+	o/-	+/-	o/-
Preservation of traditional orchards	+	+	o/+	+	o/+	o/+	+
Preservation of landscape features (trees, shrubs, hedges, etc.)	+	+	+	+	+	+	+
Preservation of landscape features (geomorphology, terraces, etc.)	+	+	+	+	+/-	+/-	+/-
aggregate	+	+	+	+	+/-	+/-	+/-

TABLE 4. Policy evaluation results for the observed landscape units.

Analysis and evaluation: A quantitative analysis of landscape change over the last decade was performed using the data from the Records on Actual Land Utilisation for the years 2002 and 2015, available at the Ministry for Agriculture website. The area of individual land use category in each landscape unit was calculated in the ArcMap 10.1 software.

Every policy measure is then assessed from the aspect of every landscape objective as: - (negative impact), o (not applicable), + (beneficial impact), or (+/-) (impacts could not be reliably foreseen or are ambiguous). The evaluation was done using the Delphi procedure, collecting the expert opinions of a group of landscape researchers in two rounds with the discussion of diverging scores in between.

Results

The overview of the results of land cover change analysis (Table 3) and policy evaluation (Table 4) in respective land units are presented below.

The decrease of cultivation can be observed in fields, meadows, and vineyards shrinkage, but on the other hand, traditional orchards and olive groves have increased. There are however considerable differences among the six units in terms of the amount and reasons for these changes: three units, Kras in particular, are still undergoing agricultural land abandonment and forest overgrowth. The intensification of agriculture, typical for Vipavska dolina in the past, has stopped, while Slovenska obala is specific for being under strong development pressure. As for the policy measures; the “preservation of permanent grassland and pastures” targets the forest overgrowth processes in Kras, Goriška Brda, and Slovenska Istra, but without many results. Conversely, the support for the orchards seem to be effective, as the trends show an increase in the orchards and decrease in vineyards, although the landscape objectives call for the preservation of both. For the objectives which refer to a specific land feature, it was not possible to assess the relevance of policy measures or they could be considered negative. For example, all measures supporting further cultivation may contradict the landscape objective requiring abandonment of intensive use on the northern, erosion prone slopes in the Slovenska obala and Slovenska Istra units.

Conclusions

The paper discusses the potential impacts of integrated policy measures on cultural landscapes. It is expected that the implementation of the measures conceived for an “average” European cultural landscape may reduce landscape diversity and increase unification. The TIA approach, which was used to analyze the potential impacts of EU policy measures on the regional (local) level, indicated the potentials and also barriers of evaluating in the multi-level contexts. While several concluding answers could not be given at this stage, the test indicates that such an analysis is useful for providing feedback to be used in the policy development cycle, and therefore support vertical integration. In particular, the method would have to be supplemented by a more detailed map analysis, field work, and interviews with stakeholders (i.e. agricultural consultants) to enable better support for cause-effect conclusions. In order to guide the implementation of the measures in a more spatially sensitive way, the planning and management instruments need to be used more effectively.

References

- Decree on the Regulatory Requirements for Management and Good Agricultural and Environmental Conditions (Cross Compliance) in Farming. (2011): Official Journal of the Republic of Slovenia, No. 98/11, 1/13, 113/13, and 96/14.
- Golobič, M., & Marot, N. (2011): Territorial Impact Assessment: Integrating Territorial Aspects in Sectoral Policies. *Evaluation and Program Planning*, 34(3), 163–173.
- Golobič, M., Marot, N., Kolarič, Š., & Fischer, T. B. (2015): Applying Territorial Impact Assessment in a Multi-Level Policy-Making Context – The Case of Slovenia. *Impact Assessment and Project Appraisal*, 33(1), 43–56.
- Lomba, A., Guerra, C., Alonso, J., Honrado, J. P., Jongman, R., & McCracken, D. (2014): Mapping and Monitoring High Nature Value Farmlands: Challenges in European Landscapes. *Journal of Environmental Management*, 143, 140–150.
- Marušič, J., Ogrin, D., Jančič, M., Podboj, M., Maligoj, T., & Jug, M. (1998): *Krajine primorske regije*. Ljubljana, Ministrstvo za okolje in prostor RS, Urad RS za prostorsko planiranje.
- Natura 2000 Site Management Program from 2014 to 2020, (2014): Ljubljana, Ministry of Agriculture, Forestry and Food, Department of Nature Conservation, Nature Protection Institute.
- Rode, J., Artenjak, D., Črv, B., Flisar Novak, Z., Kalan, M., Očepek, J., ... Zupančič, M. (2013): *Analiza ciljev in ukrepov programa upravljanja območij Natura 2000. Sektor kmetijstvo (No. 2.0)*. Ljubljana, Kmetijsko gozdarska zbornica slovenije.
- Regulation (EU) No. 1307/2013 of the European Parliament and of the Council (2013).
- Rural Development Programme 2015–2020. (2015): Ljubljana, Ministry of Agriculture, Forestry and Food, Directorate for Agriculture.
- Žgavec, D. (2012): *Prišpevek ukrepov kmetijske politike k ohranjanju travšč (primer krajinskega parka Radensko polje)*. Ljubljana, Univerza v Ljubljani, Biotehniška fakulteta.
- Žvikart, M. (2010): Uresničevanje varstvenih ciljev iz programa upravljanja območij Natura2000 v kmetijski kulturni krajini. *Varstvo Narave*, (24), 21–34.

Back to Shanshui: Dwelling in the Mountains of Shihua Cave

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real shanshui | mountain dwellings | site observation |
conception development | general arrangement

Chinese gardens are often combined with residential houses to express the owners' enthusiasm for nature within the confined spaces of manmade habitats. Nevertheless, this kind of 'artificial Shanshui' (garden) originates from the real Shanshui 'Scenic and Historical Place,' -a contemporary, specially designed type of landscape that is commonly found in China.

At present, the ecological planning is not sufficient and often does not take into account the cultural elements of its natural surroundings.

This paper will examine the scenic and historical place of the Shihua Cave, in developing a method of constructing contemporary Shanshui from a cultural perspective. The 'dwelling in the mountains' is a special type of architecture that allows harmonious living within nature. Two of the project's key points will be discussed: the Huaixiang Yard (the name of which refers to the fragrant Sophora flower) and Lingxiu Villa (which means ingenious and elegant regressively).

Mountain dwellings can be viewed as a bridge that connects humans and the nature (real Shanshui) that surrounds them, guiding people to appreciate the ancient oriental conception of landscape. As such, the planning idea of going back to the Shanshui in contemporary design landscapes fills the historical gap in a very conceptual way.

1. Conceptions: Real Shanshui; Mountain Dwellings; Scenic and Historical Places

Shanshui is a Chinese cultural conception that literally translates as meaning mountains and water, which together can be understood as the landscape. In the context of Chinese culture, Shanshui represents an artistic style that is profoundly related to landscape or nature; for example, a landscape painting, the landscape poem, or the landscape garden, which is generally defined as the Chinese garden.

Chinese gardens are often combined with residential houses (Wang 2006:212) to express the owners' enthusiasm for nature within their limited living space. However, this form of 'artificial Shanshui' originates from the 'real Shanshui,' such as palaces and villas that were constructed in mountainous regions or on waterfronts. The villa described in Shan Ju Fu (Xie 425:01) dominated a huge area. Since the Tang Dynasty (618AD-907AD), however, gardens have been integrated into cities and have significantly shrunk in size. Thus, artificial Shanshui have become popular.

Chengde Mountain Resort (built 1703AD-1792AD, 5.6km²) and the Summer Palace in Beijing (built around 1749AD-1764AD, 2.9km²) are typical examples of real Shanshui. They were constructed with the intention of creating a comfortable living environment within nature. Wang instructed us to "listen to the early birdie when one gets up in the morning... watching the sunset when going to sleep at night... ordering a small boat... to go fishing in a brook... picking fresh fruits..." (1526-1590:01), so as to enjoy nature via a leisurely life of "acquainting and associating, no welcome or farewell... when I drink myself to sleep, the guest left himself" (1526-1590:01).



FIGURE 1. The national rare landscape in the Karst and Cave(left); the regional common landscape outside the cave (right)

Dwelling in mountains (Xie 425:01) offers the possibility of living side by side with nature. This not only comforts the body but also provides nice views and sounds (Wang 1526-1590:01). It is believed that buildings are the central conception of real Shanshui, which can be seen as a bridge that connects humans with nature. There are four ways of appreciating Shanshui: Dwelling and recreating are better than to visit and to watch (Guo 1000-1090:01).

Scenic and historical places have significant historical and cultural value and, as such, are ideal locations for creating Shanshui because they encourage people to not only to visit to and take in the views, but also to dwell and enjoy recreational activities within the space.

In response to the conflicts between conservation and development in scenic and historical places, the article describes how mountain dwellings bridge two disparate areas together in a way that follows and respects traditions.

2. Practice: Scenic and Historical Places of Shihua Cave (SHPSC)

SHPSC is located in the southwest of Beijing. It is a special natural resource that consists of karsts and caves (Figure 1). Although there are no major attractions outside the cave (Figure 1), the ecological environment is in such good condition that there is the potential for it to be developed into a real Shanshui.

The real Shanshui, developed as part of this pilot project, set buildings within natural settings. A new landscape and recreational structures were constructed to guide visitors and develop the growing level of landscape tourism outside the cave.

The area of this project is 8 km², with 97 attractions including pavilions, terraces, corridors, waterfront buildings and yards. Huaixiang Yard and Lingxiu Villa will be described as sample cases in terms of site observation, concept development, and general arrangement, to demonstrate how landscape planning can replicate Shanshui.

3. Cases: Huaixiang Yard and Lingxiu Villa

3.1 Huaixiang Yard

3.1.1 Site Observation (Ji 1631:01)

It's a Chinese version of the site survey, it is based on the impression given by the natural landscape to decide what would fit here (Dwelling or Recreating or Visiting or Watching). E.g Huaixiang Yard, in the valley, there are large Sophora woods on a terraced hillside where people can feel comfortable and are able to refresh themselves. The gently sloping platforms, the area around which is suitable for small groups of visitors, and which is surrounded by pleasant views of the red leaves of the *Cotinus coggygia* in the north and beautiful flowers in the south. The courtyard was positioned here because it represented the ideal place in which the Yijing (a Chinese concept that is similar to 'atmosphere') of Shanshui could be created.

3.1.2 Concept development (Meng 2012:19)

It plans the themes of the mountain dwellings on the basis of site observation. In ancient times, it was possible to build a private courtyard in this area. However, accommodation is now forbidden under current laws (GB50298-1999). The Huaixiang Yard was developed to provide a place from which people can enjoy nature. The word 'huaixiang' refers to the fragrance of Sophora, which emanates from the nearby woods.



FIGURE 2. Master plan of the free-formed Huaixiang Yard (left); perspective of the Huaixiang Yard (right).



FIGURE 3. Landscape framework of the Niushan Mountain (up); the view to the south on top of Niushan Mountain (down).

3.1.3 General arrangement (Meng 2012:19)

The general arrangement for the buildings should be determined by what humans need instead of a perfect architectural layout. Improving the ease of using spaces for a variety of suitable activities, such as drinking tea and appreciating flowers, reading and listening to the rain, etc. should be the aim within the arrangement.

Mountain dwellings allow us to become closer to nature through buildings. With corridors and walls, eight individual buildings were connected into a free-form whole, set on terraces of different levels (Figure 2). The yard embodies Chinese gardens and helps lead the visitors to the surrounding views so that they can embrace nature and experience spiritual

pleasure (Figure 2). People can enjoy tea while appreciating the red leaves in the valley or practicing Yoga in these natural surroundings. In addition to offering visitors a place from which they can enjoy beautiful scenery, mountain dwellings also help people to feel at one with nature.

3.2 Lingxiu Villa

3.2.1 Site observation

The Phoenix Mountain is located to the south of Niushan Mountain (Figure 3) and is the highest mountain in the

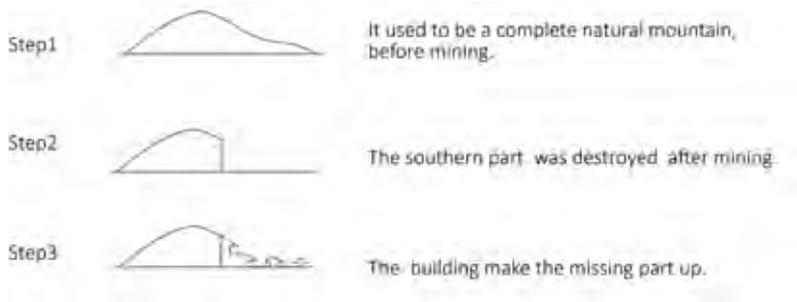


FIGURE 4. Planning process of Lingxiu Villa

landscape. Isolated and unconnected to the other mountains, Niushan Mountain is surrounded by complicated, topography and beautiful scenery.

3.2.2 Concept development

The ancient Chinese believed that the pleasure of climbing mountains could only be understood by those who reached the summit (Ouyang 1052:01). It is legal to construct accommodation facilities in the Niushan Mountain area under general law. Therefore, a landscape hotel was designed that allowed visitors to enjoy the beautiful views at different times of the day. The construction was integrated into the mountain layer-by-layer. It was named Lingxiu Villa, which means 'ingenious' and 'elegant'.

3.2.3 General arrangement

Niushan Mountain used to be a completely natural mountain; however, mining destroyed the southern part of it. The Lingxiu Villa was built layer-by-layer into the missing section of the mountain (Figure 4). It appears like a swallow flying across the landscape, and was designed such that the surrounding scenery embraces the people who dwell there.

Conclusion

Site observation is a perceptual and rational planning procedure. In addition to providing an opportunity to produce accurate scientific analysis, understanding of the site as well as the context of the development also allows us to get a sense of the spirit of nature surrounding it. Developing a concept involves combining landscape features, emotion, and function in order to connect to the Yijing of the place. The aim of general arrangement is to make full use of the surrounding natural scenery so that visitors can appreciate and embrace nature. A key consideration is how spaces can be arranged in a manner that allows natural elements, such as the moon, flowers, wind, rain, fragrance, etc., to be noticed instead of only the building itself.

Mountain dwellings can be viewed as a bridge that connects humans and nature in such a way that guides people to appreciate the ancient oriental conception of landscape. As such, the planning idea behind Shanshui in such designed landscapes was to fill the historical gap in an increasingly conceptual way.

References

- Guo Xi (Earlier Song Dynasty), Lin Quan Gao Zhi.
- Ji Cheng (Chinese Ming Dynasty), the Craft of Gardens (Yuan Ye).
- Meng Zhao Zhen, Elementary Discussion on Scenery Supporting From, China Landscape Architecture, 2012(12):19.
- Ou Yang Xiu (Earlier Song Dynasty), Record of East Garden in Zhen Zhou.
- Wang Ju Yuan, History of Chinese ancient gardens[M], China Architecture & Building Press, 2006:212.
- Wang Shi Zhen(Chinese Ming Dynasty), Record of Yanshan Garden.
- Xie Ling Yun (China Ancient Northern and Southern Dynasties), Shan Ju fu.

Avoid – Mitigate – Compensate: How to Halt the Loss of Biodiversity in Urban Agglomerations?

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eco-account | multifunctionality | offsetting impacts | polluter pays principle

Within the European Union, Germany has the fourth highest population density. With its long history of urbanisation and industrialization after World War II and its geographical position in the centre of Europe, Germany faces strong challenges to balance the demands of people's welfare and the country's natural resources like biodiversity and water quality. The current situation with a high number of people immigrating temporarily or permanently from abroad strengthens the need for finding smart solutions for long-term spatial planning and for a sustainable land use in general.

To halt the decrease of open, non-urbanized landscapes by urbanization and fragmentation is a very strong aim in Germany's nature conservation policy. Therefore, the means having been developed recently mainly consider the multiple ecological functions in planning processes when creating new urbanisation in previous undeveloped landscapes. Strict regional planning to avoid severe impacts and a generally accepted evaluation system are needed to implement these demands and to enable spatial and landscape planners as well as structural and hydraulic engineers to sustainably restructure the landscape with natural elements. Although many German landscapes are still rich in naturalness, an ongoing process of degradation of the land by spatial development is taking place. The state Baden-Württemberg with its automotive industry and other strong engineering potentials is one of the core regions of the economic development, facing the challenges way more than the nation's average.

How to Cope with Impacts: the Eco-Account Method

Regional plans restrict impacts spatially to locations outside areas of strong ecological vulnerability and without ecological protection like Natura 2000 or other protection categories. To cope with impacts in non-protected areas, most of the federal German states have been establishing "eco-accounts" by introducing laws for offsetting impacts. In 2011 Baden-Württemberg implemented the so-called "Ökokontoverordnung" (ÖKVO, decree for offsetting impacts) for all (!) public or private impacts. The author was involved in the development of the method which has become the most important means to internalize the "ecological cost" caused by new urbanizations: the one who causes the impacts has to pay for its mitigation and compensation (Polluter Pays Principle). The method runs through an ongoing development process: currently (2016/17) an evaluation is taking place to find weaknesses and strengths of the instrument and to improve the instrument's practicality.

But how to determine the severity of impacts and the quality and quantity of compensatory measures? The main principles of the eco-account method are (Küpfer 2008):

1. To determine how to avoid the impact or its negative effects
2. To mitigate inevitable impacts; figure out what measures are needed to minimize the negative effects of the impact
3. If negative effects of the inevitable impact remain: to determine the ecological status of the site to be impacted by scales or a range of points (from A = low quality to Z = high quality, or other scales). This should be done for biotopes and also for soils, water, climate, and landscape character (example with a scape from 1 to 64 points from ÖKVO for biotopes see Table 1)

Table 1. Evaluation system of existing and planned biotopes in Ökokontoverordnung (ÖKVO; = decree for offsetting impacts, excerpt); unit: Eco Point (EP)

ID number for type of biotope	Type of biotope (name)	Existing biotopes	Planned biotopes
33.10	wet meadow	14 / 26 / 39	14 / 26 / 34
33.41	typical meadow on fertile soils	8 / 13 / 19	8 / 13 / -
36.70	xeric grassland	22 / 37 / 50	22 / 31 / 37
37.11	field in intensive use	4 / 8 / -	4
41.21	typical hedge on dry soils	14 / 23 / 35	14 / 18 / 23
53.10	oak forest on dry soils	22 / 43 / 57	22 / 28 / -
60.10	asphalt, concrete	1	1
	Additional or reduced number of EP depending on + number of endangered species living in biotope above average + rich in structures, ecotones etc. + ... - number of endangered species living in biotope below average - eutrophicated sand/or disturbed site, - ...		

TABLE 1. Evaluation system of existing and planned biotopes in Ökokontoverordnung (ÖKVO; = decree for offsetting impacts, excerpt); unit: Eco Point (EP)

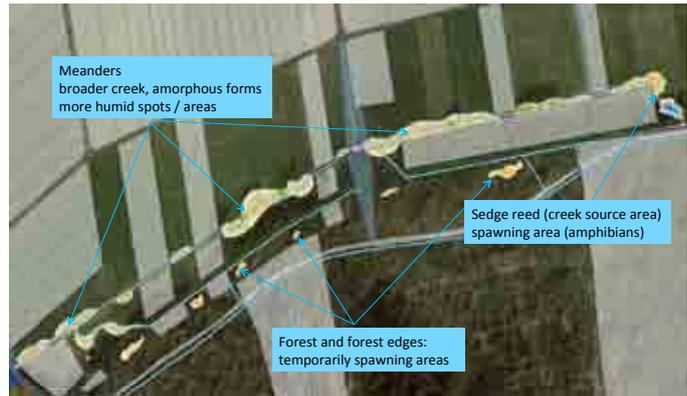


FIGURE 1. Overview on the package of multifunctional measures (Riederwiesen project)

- To predict the ecological status of the site after being impacted, do this by the same scales or a range of points as under 1.; include interdependencies and side effects like biotope fragmentation into assessment
- To compare 3 and 4 and calculate the difference between status ante and status post, multiply by the area [ha or m²] impacted respectively (quantitative ecological deficit, “qed”, unit: Eco Point(s), EP)
- To find areas where it is possible to increase the ecological quality by measures and run through the same process again (this time quality of status ante is lower than the one of status post, because of ecological improvements)
- To define and implement measures in areas as described under 6. (quantitative ecological surplus, “qes”)
- To allocate the adequate number of the compensation’s surplus eco points (qes) to the deficit in eco points (qed) caused by the impact. As soon as the “eco-account” is balanced, the impact is compensated.

Note: it is not sufficient just to equalize eco point deficits. Any measure being done for compensation purposes must originate from an ecological or landscape concept.

Table 1 shows excerpts of the eco-account evaluation system. After mapping, the biotopes are to be evaluated by this system. The scale ranges from 1 EP (for asphalt or concrete areas) to 64 EP (natural, undisturbed, highly endangered biotopes being very rich in species). Columns 3 and 4 (for existing and planned biotopes respectively) contain a triple of numbers; the second number (bold) is the common value for typical biotopes without an outstanding biodiversity on one hand and strong disturbances on the other. Hence, if the assessment for example yields an extraordinary number of endangered species living in the biotope and / or many ecotones occur, additional values can be given.

The Application of the Eco-Account to Landscape Planning

The “typical hedge on dry soils” equals 23 eco points (EP). Up to 12 extra EP can yield for very rich forms of this biotope (maximum: 35 EP, last number of the triple); if the biotope is of very low quality, EP might be reduced down to 14 (1st number of triple). The ecological value of planned or newly planted biotopes (column 4) ranges below the values of existing biotopes due to their delay in growth and habitat characteristics.

The quantities can easily be determined by the system shown above. For example: a typical hedge of 1,000 m² is to be destroyed for development purposes. The compensation by a new hedge of the same type has to be done by planning a larger hedge (1000 m² x 23/18 = 1.278, roughly 1.300 m²). In some cases it’s not possible to create a new hedge but a new piece of forest instead. If for example it makes sense to plant oaks on a suitable site, only 820 m² are needed (1000 x 23/28). The higher the value of the planned biotope, the lower is the area needed for compensation. This is an important issue in landscapes “under pressure”, e.g. where strong demands for development occur and space for measures is rare. The numeric approach is valid for finding the quantity of a compensatory measure, but not for its type. So planning without a concept on how and when to implement a measure is not accepted by the authorities! Therefore, every plan is bound to a professional survey and expertise, based on deep knowledge on landscape ecology and biology.

Figure 1 presents a multifunctional measure planning (“Riederwiesen”) in an “everyday landscape” where space for measures is rare (Küpfer & Arnold 2015). The main objectives are water retention to prevent flooding (centre of Figure 1) due to a new residential development (left side). The retention is linked to several measures where biotopes are to be newly created or optimized in their quality. Furthermore, the area will be (partly) accessible for the public and information on the project on panels are given.



1. Residential development „Wolfloch“

ecological deficit (impact on biotopes, soils, ...): ⇒ -219.000 EP

2. Riederwiesen

impact on soils: ⇒ - 18.000 EP

sum of impacts: ⇒ -237.000 EP

3. Riederwiesen

benefit to ecology: ⇒ +620.000 EP

remaining on eco-account: 383.000 EP

FIGURE 2. Impacts and compensations in the Riederwiesen area measured as eco points

Figure 2 shows the quantities of impacts and impact compensations measured in EP. The residential development causes non-avoidable impacts of a value of roughly 220,000 EP. On the contrary, the offsetting site's quality will strongly increase caused by regained water retention ("Riederwiesen" meaning reed meadows which in former times were very wet and now regain their original potentials): the project creates 620,000 EP and therefore covers the impact's value of roughly 240,000 EP. The remaining 380,000 EP will be transferred to the municipal eco-account and can be used to compensate further non-avoidable impacts.

In general, eco-account measures are to be implemented prior to an impact or even independent of foreseen impacts ("early action"). The ÖKVO provides an interest rate of three percent per year to encourage companies or other institutions who cause impacts to implement measures prior to and independently from an impact. The interest is given for implementations up to 10 years prior to the impact. Altogether, this interrelation has increased developer's ecological awareness and helped to generate measures to improve the ecological quality of the landscape.

Conclusions

Many German landscapes are still rich in naturalness and/or have the potential to provide a high biodiversity. Nevertheless, after World War II an ongoing urbanization has been taking place in the Stuttgart region. Farmland has been transformed into residential and (most of all) commercial land due to strong demands by politics, economics, and population. Regional planning, transdisciplinary cooperation and a valid and transparent evaluation system for impacts and their offsetting are strongly needed to achieve the aims of halting the loss of biodiversity, to maintain and to regain the originality of the landscapes where interventions take place.

Although the challenges are strong, there are reasons to be hopeful about finding sustainable solutions: legislation (at the EU, Nation, State levels) gives a framework for the process and people's awareness of the problem has risen a lot in recent years. Due to the "Polluter Pays Principle" the eco-account is the key instrument to maintain and regain ecological qualities and biodiversity in landscapes "under pressure". Regarding the examples, success has been achieved by an intense civil participation and argumentation with developers, landowners, and farmers.

References

- Küpfer, C. (2008): The eco-account: a reasonable and functional means to compensate ecological impacts in Germany – *Arquitectura e vida Lisboa* 96, 64-69 (<http://www.stadtlandfluss.org> -> Publications).
- Küpfer, C. & S. Arnold (2015): *Naturschutzrechtliche Eingriffe in der Bauleitplanung und ihre Kompensation – Lösungsmöglichkeiten* – BWGZ 20, 1119-1124.
- Land Baden-Württemberg: *Ökokonto-Verordnung vom 1.4.2011* (<https://www.lubw.baden-wuerttemberg.de>).

Urban Planners' Understanding of the Green Infrastructure Concept

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green infrastructure concept | collaboration process | urban planning

Green Infrastructure (GI) has been presented as an integrative approach for land use planning combining multiple functions of the urban environment. GI does not have a single widely recognized or accepted definition. The research examines Finnish urban planners' understanding of the role of green infrastructure and its elements in urban areas.

The process followed a model for establishing the collaboration of mixed science-practice groups, which was developed for the project. During the workshops, several challenges in implementing the GI in urban planning were identified and the lack of understanding the potential of GI concept was one.

The definitions for GI produced by the participants reveal the level of understanding. When the definitions of the pre-questionnaire and post-questionnaire were compared, it was possible to detect a clear change towards a more holistic understanding. It was also notable that the lack of common terminology is an obstacle for implementing GI in planning.

Introduction

Green infrastructure (GI) has been presented as an integrative approach for land use planning (Benedict 2006) combining multiple functions of the urban environment. GI can be considered to contain all natural, semi-natural and artificial networks of multifunctional ecological systems within, around and between urban areas, at all spatial scales (Tzoulas et al. 2007). The underlying principle of GI is that the same area of land can frequently offer multiple benefits if its ecosystems are in a healthy state (EU Commission 2013).

Internationally identified benefits of GI solutions are promising and the intent to integrate multifunctional green infrastructures into urban structure is emerging on the policy level (Albert et al. 2014). However collaboration is needed to implement, develop and test the latest research results in the real-life urban planning and design projects (Lennon et al. 2016).

For the research question “how do planners understand the role and the significance of green infrastructure in urban areas” the data was collected through a series of workshops and questionnaires. The process followed a model for establishing collaboration of mixed science-practice groups (Ariluoma et al. 2015). During the workshops, several challenges in implementing the GI in urban planning were identified, the lack of understanding the potential of green infrastructure concept was one of them.

Theoretical Background

The attitudes towards urban nature have gradually changed from utilization to recognition of recreational values, conservation and finally to stewardship of ecosystem services. The concept of GI is receiving increasing attention as a means to translate the ecosystem service approach to the land-use management and the built environment (Baro et al. 2015).

GI is fundamentally a spatial concept and is composed of different green (and blue) elements or assets such as individual trees, gardens or green roofs (Faehnle et al 2014). When designing these separate elements of urban environment, urban planners and designers should understand how the ecosystems interact and network. Urban GI network forms a system, where changes in one element can affect the circumstances of the others.

GI does not have a single widely recognized or accepted definition (Wright 2011), but an understanding of the GI concept and the production of ecosystem services would increase the denominated value of singular landscape elements forming GI network. Well-assimilated GI approach can help to combine urban development with ecological limits (Lennon et al 2016).

Research Method

The methodological framework of the present research uses focus groups, which consisted of land use planners from three Finnish cities: Jyväskylä, Tampere, and Vantaa. The cities were selected because they have ongoing large-scale or otherwise demanding land use projects so representatives of the cities (i.e. planners) would be experienced of tackling with different challenges related to urban development. For the research process, the cities had their own case area, which was under development and created a concrete framework for the research process.

Groups of 5-8 planners working with the development of the case area with diverse backgrounds were asked to take part in the research from each of the target cities. The data was collected in a collaborative process based on a social learning model (Ariluoma et al. 2015) that started with a questionnaire collecting participants' background data as well as their views on GI in urban planning. The most pivotal parts of the process were two workshops. In the first workshops the aim was to draft a vision for each development site based on the site's GI potential. In the second one the participants were invited to discuss the barriers preventing the realization of the earlier defined GI visions.

The process ended with a post-questionnaire, part of which included the same questions as in the first questionnaire, as well as new questions. The aim was to see how well the concept of GI is familiarized by these people who plan and make decisions about urban environment. However, the variation of the professional background of the participants was emphasized for raising different perspectives on the issue. As GI is a multidisciplinary concept, it was assumed that no single professional group could cover it throughout.

The collaborative process distributed a large amount of material, which is transcribed and analysed. The research question "how do planners understand the role and the significance of green infrastructure in urban areas" is approached in the questionnaires in the beginning and in the end of the process.

These definitions give a very straight-forward insight to the understanding of the concept and can be used to develop a three-tier structure about GI understanding.

Results

The definitions produced by the participants represent three rather clear perceptions about GI. The first category includes definitions where GI is seen to be limited to the planned green and recreational areas. Participants gave definitions such as: "Green coloured areas in different urban planning documents."

In the second category GI was described to form a green structure, definitions such as "Green infrastructure is composed of green network that we have in cities" were given. This type of definition reveals already a deeper level of understanding about the concept, where value is given to all natural or vegetated areas that exist in urban structure. Still understanding was limited to mere physical structures.

The third category of definitions recognizes systematic nature of GI. Different scales, functionality and processes were attached to the definition: "The entity of the landscape and nature on micro and macro level as well. For example hydrological cycle as a whole or a single tree on micro level. Different elements in nature and urban environments that deliver ecosystem services."

When the definitions of the pre-questionnaire and post-questionnaire were compared, it was possible to detect a clear change towards a more holistic understanding, with the amount of elaborate second and third category definitions were increased.

Discussion

The results indicate that the understanding of the concept of GI varies among the planners. Based on the results we can argue that the key challenge is that the concept of GI is not yet well established, widely in use and thoroughly understood. The present research emphasizes further the need for multi-disciplinary collaboration in defining the concept of GI.

Collaboration would help to solve environmental challenges, especially urbanization and climate change adaptation. For this the concept of GI can offer a beneficial tool once it is understood deeply enough. The lack of common terminology is an obstacle for implementing GI in planning, but the research shows that the interdisciplinary collaboration can be beneficial.

The analysis of the data collected in the process will continue, and further results will be published later on. The three-tier structure will be imposed on the data from the workshops to analyse it and the original structure will be redefined.

References

- Albert, C, Aronson, J, Fürst, C. et Opdam, P, 2014. Integrating ecosystem services in landscape planning: requirements, approaches, and impacts. *Landscape Ecology* 29(8), 1277-1285.
- Ariiluoma M, Kalliala E, Lähde E et Tahvonen O. 2015. Interaction of science and practice in green infrastructure planning in Finland - collaboration methods for planners and researchers. In *Eclas 2015, Tartu, conference proceedings*.
- Baró, F, Bugter, R, Gómez-Baggethun, E, Hauck, J, Kopperoinen, L, Liquete, C et Potschin, P. 2015. Green Infrastructure. In: Potschin, M. and Jax K. (eds): *OpenNESS Ecosystem Service Reference Book*. EC FP7 Grant Agreement no. 308428.
- Benedict, M. et McMahon, E. 2006. *Green Infrastructure, Linking Landscapes and Communities*. The Conservation Fund, IslandPress.
- EU Commission, 2013, *Green infrastructure Strategy*.
- Faehnle M, Söderman T, Schulman H et Lehvävirta S. 2014. Scale-sensitive integration of ecosystem services in urban planning. *GeoJournal* (2015) 80:411–425.
- Lennon M, Scott M, Collier M et Foley K 2016. Developing green infrastructure ‘thinking’: devising and applying an interactive group-based methodology for practitioners, *Journal of Environmental Planning and Management* 59:5, 843-865.
- Tzoulas K, Korpela K, Venn, S, Yli-Pelkonen, V, Kazmierczak, A, Niemela, J. et James, P. 2007. Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. *Landscape and Urban Planning* Volume 81, Issue 3, 20 June 2007, 167–178.
- Wright, H. 2011. Understanding Green Infrastructure: The Development of a Contested Concept in England. *Local Environment* 16: 1003-1019.

Green Open Space Development in Dachang Under the Influences of Jing-Jin-Ji Regional Integration Policy

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regional integration policy | green open space | Jing-Jin-Ji

Beijing increasingly encounters inadequate space, traffic congestion, unaffordable housing and air pollution. Since 1982, experts have begun research on how to resolve these issues with a regional integration policy. With a series of political policies and activities, Beijing and its neighbours – Tianjin and Hebei province (abbreviated to Jing-Jin-Ji) are advised to combine as the biggest integrated metropolitan region in north China. This policy decreases the gaps of economy, society and culture between Beijing and its adjacent areas and relieves Beijing from urban sprawl. Dachang, a county of Hebei province, is one of the 14 regions bordering Beijing. Due to Jing-Jin-Ji regional integrated policy and locational advantage, Dachang is designated to ease the crowded land use in Beijing. New industries and population transfers from Beijing generate new demands and challenges for its green open space development. This paper analyses green open space structures and projects under the Jing-Jin-Ji regional integration at different times and scales. The discussions and conclusion are based on site analysis and comparisons with maps, which indicate that regional integrated policies stimulate the green open space development in Dachang. While on the contrary, as a Hui autonomous county, the open spaces constructions are losing their Islamic district features in order to satisfy Beijing's requirements.

Dachang Hui Autonomous County, under the administration of Langfang City, together with Sanhe City, and Xianghe County, forms the Sanhe Exclave, an exclave of Hebei province surrounded by the municipalities of Beijing and Tianjin. It is one of the 14 regions bordering Beijing. Dachang, situated 48 kilometers east of Beijing, is the nearest minority autonomous county near the capital in China. The 176 square kilometer site is located on the north China plain, with the Baoqiu River which runs through the county from north to south, and Chaobai River connects Beijing Tongzhou District with Dachang in the west. Table 1 shows that the pace of urbanization in Dachang was faster than the average level in Hebei and entire China, while there was a big gap between Dachang and other adjacent regions. There are huge gaps to be seen in the following aspects: small population, limited site area, low gross domestic product (GDP), and low amount of green open space. These gaps were mainly caused by administrative boundaries, lacking of policies supporting, and delaying economic development.

Until 2014, a specific national policy - Jing-Jin-Ji regional integration-released, it takes more than 30 years to integrate Beijing, Tianjin and Hebei from isolated regions to one mega-region (Feng 2014). The integration policy breaks administrative boundaries among three regions and enacts specific economic policies to orderly relocate all non-essential functions from Beijing to its neighbours. Following the spatial distribution, Hebei province will act as a “new-type urbanization model area” and “hinterlands supporting the mega-region's eco-environment protection”. In the detailed regional planning, Langfang is suggested to improve the carrying capacity of resources and environment and to promote migrant factories and citizens' systematic agglomeration. Here, Dachang is striving to create an environmentally friendly county along the Beijing-Tianjin green corridor. Jing-Jin-Ji

Urbanization rates in 2009	
Dachang County	48%
Beijing	85%
Hebei Province	43.74%
Tianjin	78.01%
Average in China	46.60%

Source: Feng, J. 2012

	Population 2005 in thousands	Area 2005 km ²	GDP 2005 in CNY billions
Dachang County	112	175	2.25
Xianghe County	305	458	6.45
Beijing Tongzhou District	620	870	12.99
Beijing	19720	16411	1186.59

Source: Feng, J. 2012

Amount of green open space in 2009	ha
Dachang County	9.15
Hebei Province	17000
Beijing	36754

Source: Feng, J. 2012

TABLE 1. Comparison data of Dachang and other regions



FIGURE 1. Aerial photos of Dachang at different times

regional integration brings opportunities for local economy, meanwhile Dachang is facing urban and green open space reshaping.

Xiadian Town the gateway of Dachang County to Highway 102, a major trunk route connecting with Beijing. After the first released manufactory settled in Xiadian taking use of its locational advantage, Xiadian has gradually turned into an industrial cluster. These manufactories transformation stimulate local economy and population growth. Dachang's GDP in 2014 was 7.1 CNY billion which expanded 2.16 times from 2005. The population increased from 112,000 in 2005 to 127,000 in 2014. Qige Town is separated from Beijing Tongzhou District by Chaobai River. Real estate companies explore a series of communities in order to satisfy with the living facilities needs of Tongzhou District as a sub-political centre. These communities and living infrastructures form a new community cluster. Thus, Dachang switches from a single centre county to a polycentric regional city. As a typical hinterland for transfers of industries and population, the challenge of the integration policy is both to avoid replaying city sprawl negativity like Beijing, and to supply ecological function to Beijing.

Based on a comparison of aerial photos taken at different times (Figure 1), we could see that regardless of the explosive development in urban sprawl areas, the basic essential structures for planning almost stays the same - to build a network with farmlands, rivers and waterfronts, urban and greening. The conceptual plan of structure through the whole county territory is comprised of: one core, two belts, three clusters, some landscape nodes and six green corridors. Clusters of development are situated around the agricultural core which maintains self-sustenance economic pattern and satisfies basic ecological needs. The two belts are the waterfronts along Chaobai River and Baoqiu River. The three clusters consist of the old county centre, Xiadian Industrial Cluster and Chaobai New Town Cluster. Some landscape nodes mean that the river corridor, urban canals, regional parks, urban plazas and community gardens form a network of integrated open space in every cluster. And the six corridors focus on improving the landscape quality along the six main roads' green corridors through the whole county territory.

Even though the basic structure remains, the amount of green open space, landscape quality and space optimization have improved. The author joined a project about Dachang in 2011 and went back to visit again in 2015. The following comparison of before and after effects in three typical green open spaces will show some detailed changes.



FIGURE 2. Baoqiu River Waterfront images in 2011 and 2015



FIGURE 2. Daxiang Road landscape corridors in 2011 and 2015

First case is Baoqiu River Waterfront (Figure 2). Beijing Metro Planning synthetically considers Baoqiu River in ecology protection and recreation construction aspects. Such a formal policy urges Baoqiu River to become a new green node from post-industry wasteland. The first phase of its reconstruction includes the demolition of the nearby brick factory, the banning of dumping sewage into the river and its cleaning up. For the second phase, a new dam is under construction for Chaobai into Baoqiu River water diversion. This project continues commitment to sustainability through purifying river, enriching plants and amenities which include seats, exercise areas, and walkways for pedestrians.

Daxiang Road is the main road through the county centre and Xiadian Industrial Cluster. It borders Highway 102 and adjuncts to Xianghe County in the south. In the 2011 edition of Daxiang Road Landscape Planning, the design concept “Golden Corridor” is inspired by Chinese traditional culture: yellow represents the centre location which is just like the position of Daxiang Road in Dachang county. The theme colour of pavements and plants are both chosen to be yellow. Besides, small evergreen shrubs are added in the divided strips to reduce the visual impact of glare. From Figure 3, we could see that the construction consequently basically follows the design concept and makes a continuing landscape corridor.



FIGURE 4. Tradition vs. Modern

The third project is the green open space construction in Chaobai New Town Cluster. Since 2010, Hebei province advised the “Peri-capital economy circle” policy, Chaobai New Town Cluster have developed rapidly from a former farmland to a modern living suitable area. This includes community parks, high quality community and delicate waterfront green open space to create more residential and recreational spaces for easing the crowded situations from the people who migrate from the neighbour Beijing Tongzhou District. On the other hand, in order to attract more Beijing citizens to Chaobai Cluster, these new community buildings are designed in some European cliché themes. As a Hui autonomous county, its local Islamic architecture style and county scenes are interfered by modern lifestyle which makes a negative impact on tradition (Figure 4).

Influenced by Jing-Jin-Ji Regional Integration Policy, Dachang and Beijing are becoming interdependent from central and county administration and relying on each other. Beijing economy resource offers Dachang a support for its infrastructure development. Dachang is changing from an agricultural and rural to a regional hinterland in order to satisfy the regional core city 'Beijing' demands in industrial transfer and citizen migration. All above mentioned aspects, such as landscape structure optimization, rivers management and corridors greening stimulate the establishment of an eco-friendly new county. While, supposing that Dachang continues ignoring its traditional minority culture in landscape planning and construction, it will become one of thousand cities with the same appearance.

References

- Feng, J. (2012). An Interactive Development Study of Perspectives on Regional Integration of Dachang and Tongzhou. Master Dissertation, Tsinghua University.
- Feng, J. (2014). A Spatial Development Study of Hebei Towns Surround Beijing Bases on the Background of Integration of Beijing-Tianjin-Hebei: A Case Study of Hebei Dachang. *Urban Development Studies* 21. No.8. 16-20.

Multi Temporal Mapping of Forest Landscape Change in the Mediterranean Region: The Mountain Bozdag

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forest landscape | land use-land cover mapping |
Mediterranean region | remote sensing

The Mediterranean region has one of the most significantly transformed forest landscapes, since it has been intensively affected by anthropogenic activity for millennia. Forests have been affected by massive agricultural activities, particularly around cities. This research will map the changes in land use land cover (LULC) – particularly forests – of the Mountain Bozdag as a case study area of the Mediterranean region. The study area is located between the eastern boundaries of the city of Izmir in the West and the city of Manisa in the North. As it is surrounded by the two largest cities of the region, with a total of nearly 6 million inhabitants, thus high population influx followed by massive agricultural activity causes the forest landscape change. The main objectives of the research are (1) to map LULC of the two years, 1986 and 2015 (2) to assess the amount of the deforested area for the last 29 years in the study area. To accomplish these objectives, this research uses Remote Sensing and Geographical Information Systems as analytical tools particularly ENVI 5.1 and QGIS 2.14. This research acquired remotely sensed data of Landsat TM/ETM 1986 and 2015 as the basis to map forest landscape change. The result of this research is the data yield spatially explicit maps of the forest landscape with the decrease of 21% in forest cover. The results are expected to show the importance of long term mapping of forest landscapes and to highlight the potential risk of deforestation and forest degradation in the Mountain Bozdag.

1. Introduction

For the last decades population growth and agricultural activities lead to forest landscape change. The latest estimates published by Food and Agriculture Organisation states that, forests cover 4 billion hectares – about 31 percent – of the earth's land surface however, this amount is projected to fall to 20% by 2050, and the largest deforestation is projected to occur in developing countries (FAO 2014; OECD 2012).

Forest landscape change is dominant in the Mediterranean region and LULC mapping has recently become one of the main tools to monitor it. The region has protected areas as well as a huge wealth of biodiversity which makes it environmentally valuable and sensitive (Kesgin 2008). However growing populations, and massive agricultural activities make the forest landscapes and protected areas of the Mountain Bozdag at the risk of deforestation and forest degradation.

Past and current studies related to the Mountain Bozdag cannot provide LULC change information, however its environmental value brings the urge for updated and accurate forest landscape change maps. The providing results in this research show the alteration in the composition of forest landscape over the period 1986-2015. This proves the necessity for sustainable forest landscape management in the study area.



FIGURE 1. Study Area

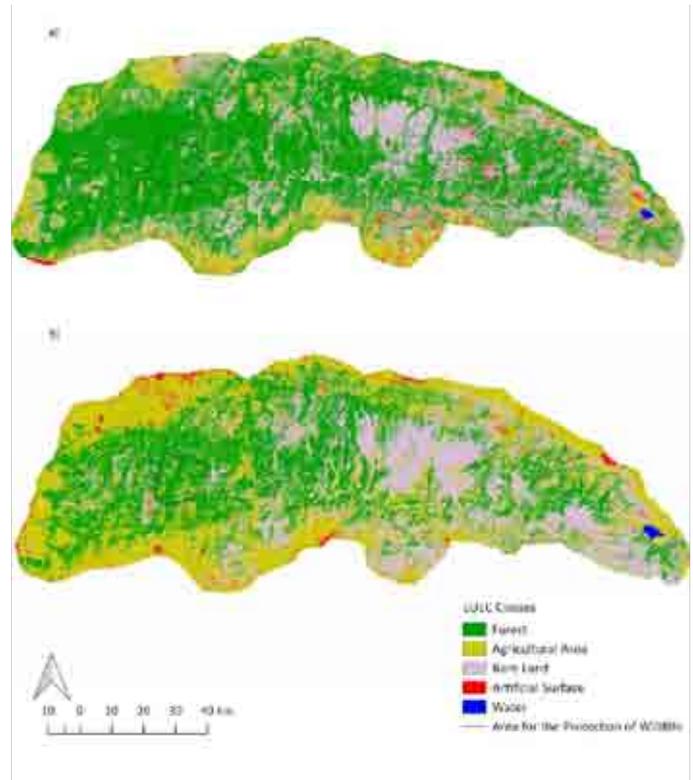


FIGURE 2. LULC Maps for (a) 1986 (b) 2015

2. Materials and Methodology

2.1 Study Area

The study area is the Mountain Bozdag, which is located between the eastern boundaries of Izmir in the West and the city of Manisa in the North (Figure 1). It is located at 38°N latitude and 27°E longitude and has a total area of 310,165 ha. The study area has a widely patchy landscape with a mean altitude of 1000-1200m above the sea level and the highest peak is 2159 m. It has a Mediterranean climate which is characterized as temperate-humid in summer and mild in winter. The average minimum temperatures during winter is 6°C and during summer approximately 27.5°C while the mean monthly precipitation ranges between 8000 and 1100 mm for the last 30 years (GDM 2014).

The dominant vegetation consists of evergreen forests of *Pinus brutia*, *Pinus nigra*, *Platanus sp.*, *Alnus glutinosa*, shrubs composed of *Quercus coccifera*, *Quercus cerris*, *Quercus infectoria*, *Laurus nobilis*, *Olea europaea* and grape orchards. Moreover, there are protected areas in Mountain Bozdag, such as "Area for the Protection of Wildlife" and 3 Natural Monuments *Castanea sativa* in Ovacik Village (GDN,2014). However, these ecologically valuable protected areas have experienced deforestation and forest degradation due to massive agriculture as well as the road infrastructure, thus creating a substantial risk to the forest landscape in the study area.

2.2 Data Processing

The following remotely sensed cloud-free data were used for the classification of LULC in the study area; Landsat 5 TM on July 15, 1986, Landsat 7 ETM+ on June 22, 2015. The images were radiometrically corrected by using FLAASH module and the acquired imagery classified using a maximum likelihood algorithm of ENVI software. The images were classified into five LULC classes: forests (including semi-natural areas), agricultural areas, artificial surfaces, bare land, and water (Malkoc 2012).

2.3 Forest Landscape Chance Mapping

The maximum likelihood classifier was provided with the spectral reflectance properties of each class in the form of the mean reflectance for each spectral waveband and the associated covariance matrix. This data was generated from a selection of sample training pixels for each class provided from remote sensing data (Jensen 2007). The output aggregated to 2 classes that are forests and non-forest. The annual deforestation rate and total amount of forest landscape change were estimated during the period from 1986 to 2015 (Rabenilalana et al. 2010; Vittek 2014).

3. Results and Discussion

To answer the first research objective satellite images of 1986 and 2015 were classified into 5 classes (Figure 2). The temporal maps and the area statistics (Table 1) show that forest landscape decreased over time, which is due to its conversion to agricultural land. The dramatic decrease occurred in forest landscape: from 164,961 ha. to 99,812 ha., while agricultural land increased from 44,976 ha to 110,571 ha. over the 29 years period. The area under artificial surface also witnessed a slight

LULC Classes	1986		2015		Total Change	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Forest landscape	164,961	53,1	99,812	32,1	-65,149	-21,0
Agricultural land	44,976	14,5	110,571	34,9	65,595	+21,1
Bareland	94,046	30,3	92,669	29,8	-1,377	-0,4
Artificial surface	5,933	1,9	6,632	2,1	0,699	+0,2
Water	0,482	1,5	0,482	1,5	0	0

TABLE 1. The Total Amount of LULC

LULC Classes	1986 Area (ha)	2015 Area (ha)	Annual Deforestation Rate of Mountain Bozdag (%)	Annual Deforestation Rate of Turkey (%)
Forest	164,961	99,812	2,2	0,13
Non-Forest	145,204	210,353		

TABLE 2. Annual Deforestation Rates

increase from 1986 to 2015 while bare land slightly decreased as land in Bozdag and has started to mainly be used for residential activities by public.

For the second research objective, in order to assess the amount of the deforested area the total change of forest landscape were calculated for two periods, 1986 and 2015. Results (Table 2) shows that forest landscape decreased by 21,0 % and non-forest increased by 21,1%; the annual deforestation rate in the study area is 2,2 %, however this is very high in comparison to the national deforestation rate of 0,13 % in Turkey (FAO 2014). This shows that the pressure on the forest landscapes of Mountain Bozdag is extremely high.

The applied methodology can be used for species-specific vegetation maps to monitor the particular forest landscape types of the Mountain Bozdag in the future and can be integrated with dynamic forest landscape modelling techniques.

4. Conclusion

The structure of the landscape in the study area has changed dramatically over the 29 year period. The forest landscape and the protected areas deforested are also under the risk of forest degradation in the future due to the conversion of the forested area into agricultural land. Mapping and quantifying the results of agricultural activities on forest landscapes may facilitate the design of efficient and assessable forest landscape planning policies and risk assessment studies in developing countries.

The outcomes of this research will contribute to the management and planning institutes through the creation of reliable mapping information for better decision making over a sustainable forest landscape management. Remote sensing is one of the most effective tools to monitor changes in mountainous areas that are at risk of deforestation and forest degradation. Thus, the magnitude of mapping forest landscape change should be promoted by the management, and planning institutions in order to enable the public to inform about past and current situation of their lands. So, it is necessary to strengthen the coordination and cooperation among the

management and planning institutions and public.

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References

- General Directorate of Meteorology, 2014.
- General Directorate of Nature Conservation and Natural Parks, 2014.
- Jensen, J. R., 2007. Digital techniques of remote sensing. Retrieved from University of South Carolina, Center for GIS and RS.
- Kesgin, B., Nurlu E., 2009. Land cover changes on the coastal zone of Candarli Bey, Turkey using remotely sensed data. *Environmental Monitoring and Assessment*. 157 : 89–96.
- Malkoc, E., 2012. The potential of the Simulated PROBA-V satellite imagery for forest cover mapping at the Continental region. *South-Eastern European Journal of Earth Observation and Geomatics*, Vo1, No2.
- Rabenilalana, F.M., Rajoelison, L.G., Sorg, J.P., Pfund, J.L., Rakoto Ratsimba, H., 2010. Multi-temporal analysis of forest landscape fragmentation in the North East of Madagascar. IUFRO Landscape Ecology Working Group International Conference, Portugal, September, 2010.
- State of the World's Forests: Forest Genetic Resources, 2014. Food and Agriculture Organization of the United Nations, Rome, ISSN 1020-5705.
- Vitteck, M., Brink, A., Donnay, F., Simonetti, D., Desclé, B., 2014. Land Cover Change Monitoring Using Landsat MSS/TM Satellite Image Data over West Africa between 1975 and 1990. *Remote Sensing* 6: 658-676.

Bridging the Gap: Indigenous Methods as Necessity to Heal Landscape and Enhance Cultural Identity

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wetlands | indigenous methods | rongoā | landscape design | Wairarapa

New Zealand's landscape is an invaluable resource that is often taken for granted and undervalued in today's economy. Providing economic benefits alongside cultural identity results in a diminished landscape as the population expands and development sprawls. A shift in thinking is required to ensure the natural environment is protected for the future – a shift that acknowledges the amenity value of the land and the embodied indigenous knowledge.

This paper examines Lake Wairarapa, the third largest lake in the North Island of New Zealand located only 80km northeast of the capital city Wellington. Historically the lake covered 210km² holding some of New Zealand's most significant wetland systems. Today the lake has shrunk to 78km². This significant drop in area is due to the introduction of farming including both agriculture and horticulture, which have also now become the primary sources of pollution. The rapid decline in the quality of the lake has resulted in a landscape in desperate need to be healed.

This paper explores how this threatened natural land can be used to motivate the design of a regenerating ecosystem that not only provides amenity value but also begins to mitigate the adverse effects of inevitable development. It trials the use of traditional indigenous Māori healing methods to restore the underlying ecological function that benefits the environment and the Greater Wellington Regional Green/Blue Infrastructure.

Problem Statement

Natural systems throughout New Zealand that remain unharmed are in decline. This started in early European settlement with the introduction of new resources and a mindset driven by economics. Pre-European New Zealand was a land of bog, marsh, and peatlands, resulting in the majority of the land cover being a large-scale wetland. Over the past century “90% of these wetlands have been destroyed or significantly modified through draining and other anthropogenic activities” (Harmsworth 2002: 8) supported by governmental Acts that date back to 1908, in order to provide land for farming and built development.

Lake Wairarapa, historically the third largest lake in the North Island of New Zealand once held some of the country's most significant wetland systems. The combination of farming in both agriculture and horticulture has resulted in a loss of 37% of the lake area to industry – an area of 132 km² (Figure 1). The addition of infrastructure such as stop banks, drains, and constant pumping stations combined with clearance for productive pasture are the primary sources of pollution and have significantly reduced the quality of the lake.

The region is home to two Māori tribes, *Kahungunu ki Wairarapa* and *Rangitane o Wairarapa*. These tribes were put into a difficult position during the settlement wars, and as a result they gifted the lake to the British Crown. The lake and the surrounding land historically provided for the people through means of transport, food, medicine, material and it also held deep spiritual connections. Following the change of ownership, the lake deteriorated to its current condition. This paper explores how traditional healing concepts practiced by Māori can aid landscape architecture and find more resilient alternatives to the heavily engineered infrastructural solutions enacted and proposed. In doing so, there is also the potential to heal the people.



FIGURE 1. Historic (hatched) and current (white) area of Lake Wairarapa.
Author: A Hunter



FIGURE 2. South Wairarapa region showing natural and built infrastructures.
Author: A Hunter

South Wairarapa

Lake Wairarapa sits beneath the Ruamahanga ranges. Currently the lake is approximately 2.5 meters at its deepest point, more than 3.5 meters shallower than in its recent past. The two main water sources that fuel the lake are the Ruamahanga and Tuaherenikau Rivers (Figure 2).

Public infrastructure has disturbed ecological tendencies occurring pre 1950's but has contributed to reduce the impact of flooding in the area. The implementation of a 4.2km long and 500m wide river diversion in the Ruamahanga River in a form of a channel has enhanced productivity through agriculture and horticulture but has also deeply damaged the wider ecosystem. In the last 60 years the communities living in the region have suffered equally, experiencing a decline in overall education and well-being; a reduction in the quality of their water quality and a loss of the aesthetic value of the waterways. As a consequence, people tend not to respect the presence and life of the waterways as they had in the past. Due to the development of the lower Wairarapa valley flood scheme and the introduction of a river diversion, much of the lake and surrounding wetlands have been drained or modified and areas of water have been diverted to allow for a more controlled and managed environment. The natural systems no longer provide a mean of recreation, food, medicine, transport and so forth.

Healing the Landscape

Over the years following European colonisation, there have been numerous arguments around the increasing decline in awareness of cultural landscapes and practice of traditional Māori methods. The use of chemicals, technologies and land modification have taken its toll on natural practices. This not only affected the land, but also the people who witness and experience the changes (Figure 3).

Rongoā Maori is a traditional healing system that focuses on the oral transmission of knowledge, diversity of practice and the spiritual dimension of health and wellbeing. It encompasses herbal remedies, physical therapies and spiritual healing (Ahuriri-Driscoll 2008).

The idea of 'healing' is widely understood as a method primarily applied to a person; however this same method can be adapted to the land "*since the land should be our first patient*" (McGowan 2009). Rongoā is the term for the traditional Māori methods practiced by *tohunga* (experts, healers); it is a way of living through the weaving of nature, *wairua* (spirit) and people to form a realm of well-being. This holistic indigenous method is about understanding the land and what it provides, requiring one to have a greater knowledge of the condition of the land, thereby gaining an understanding of what is causing the problem and facilitating a design solution.

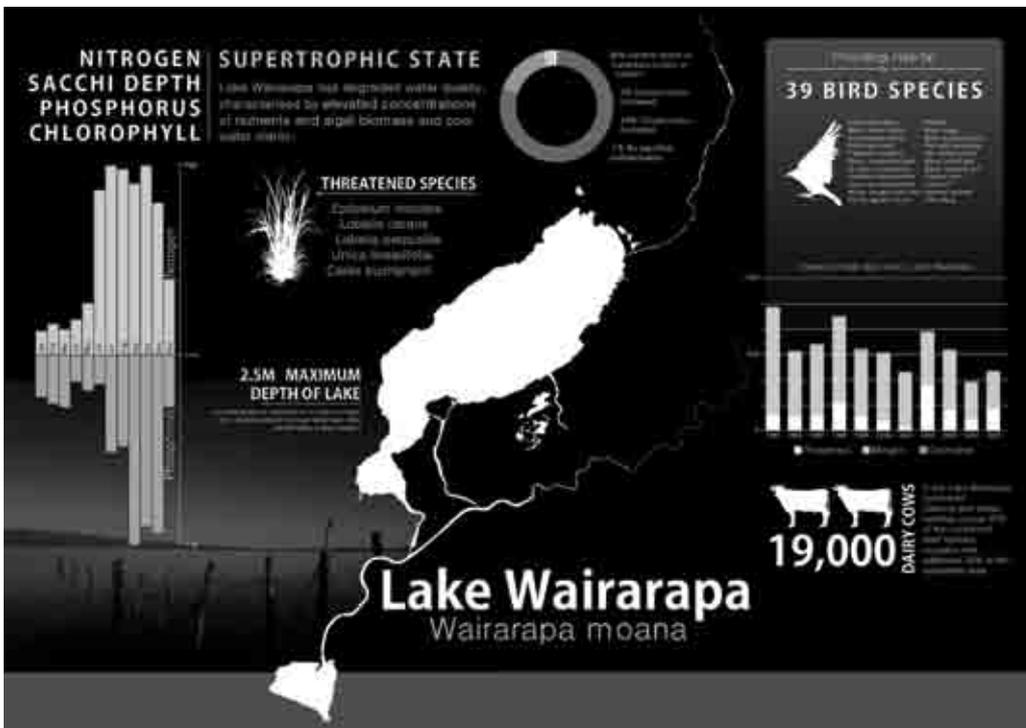


FIGURE 3. Infographic of Lake Wairarapa. Author: K Cole.



FIGURE 4. Three design proposals for the selected sites along the lake's shore and river diversion. These design solutions bring together the concepts of Rongoā as well as water and storage, material production and restoration, food production and recreation. Author: A. Hunter.

Rongoā Māori can be an important tool for restoration by incorporating the deeper meanings of cultural values and methods to re-connect and re-develop a way of designing for the land and people. “Restoration not only of the environment but of the people” (McGowan 2009: 32).

Design Strategies

Designing with the concepts of Rongoā and weaving them through the principles of landscape architecture, then developing and testing the design through a series of iterations can lead to a more sustainable approach (Figure 4). This strategy allows the intertwining of natural systems that incorporate native vegetation; with opportunities to re-educate people

Principle	Attribute	Application
CONNECTION	Physical connection will create an overall positive reaction in terms of well-being and will allow the river to preserve the mauri (life) it once held	The design proposal deconstructs the Rāmātanga cut-off and allows the reconstruction of the Rāmātanga River to Lake Wairarapa.
DIVERSION	The conceptual development has led to the diversion being formed around the perimeters of the original land farms	By developing an ephemeral flood plain that functions with flood events around the lagoons, proves to be a solution in blurring the lines between infrastructure and natural systems.
WETLANDS	Wetlands as a natural system may be constructed within the lagoons in order to provide filtration of any unnecessary pollutants, nutrients and sediments that contribute to the decline in regional water quality	Three different wetland systems have been implemented. The first lagoon will be a sediment basin that allows the further two lagoons to become on-line surface flow wetlands. Through the incorporation of restoration and farming the local private owners may consider to allow riparian buffers along diaries and water races that connect to the water riparian buffers along streams and the Rāmātanga River
KNOWLEDGE	Research is introduced throughout the design incorporating practices of Māori (Māori knowledge) in all designs, considering mauri (life) water strength and the mauri (life) of the design. The design also considers design ideas in the use of plants through riparian connections and physical use	Plants were selected to include any indigenous species that to allow for traditional Māori practices of Rongoā and to describe the plants to be selected as traditional Māori (Māori knowledge) through learning about plants in terms of medicinal uses, food production, material uses and through the systems and connectivity of the surrounding landscapes.

TABLE 1. Design principles established with the typologies. Each design principle is explained in terms of attributes and design application.

on the significance of cultural landscape, hereby increasing diversity, and healing both the land and the psychic damage to the people through the process of restoring a damaged environment.

To test this proposition, this study has explored the softening of the hard infrastructure, with natural systems and cultural practices. The river diversion is a place of hard infrastructure and it is here where the analysis led to the establishment of three different typologies making it something more than a simple restoration project. These typologies surround the uses of water and water storage, material production and restoration, as well as food production and restoration as summarised in Table 1. To be a viable option and taking into consideration the site's location amongst productive agricultural lands, un-doing the historic linear approach must be balanced with the needs for beneficial economic growth.

Conclusion

This study has developed and tested an approach whereby cultural concepts and practices aid landscape architecture in the creation of new/old methods for healing. They reinstate the connections between man and his environment as well as create experience and engagement for the public with indigenous knowledge. This strategy also allows the infrastructure to become one with the natural systems to create a more sustainable environment, providing ecological and economic benefits. The process involves the shift of current thinking to consider landscape as a complex and valuable asset that adds to our cultural identity and spiritual well-being as well as our economic benefit.

References

- Ahuriri-Driscoll, A., New Zealand. Ministry of Health, Institute of Environmental Science Research, & Te Whare Wānanga o Awanuiārangi. (2008). The Future of Rongoā Māori Wellbeing and Sustainability : A Summary / Annabel Ahuriri-Driscoll ... [et Al.].
- Harmsworth, G., New Zealand. Ministry of Environment, & Landcare Research (2002). Coordinated monitoring of New Zealand wetlands Phase 2, Goal 2: Maori environmental performance indicators for wetland condition and trend. Available at http://www.landcareresearch.co.nz/publications/researchpubs/harmsworth_monitoring_wetlands.pdf.
- McGowan, R. (2009). Rongoā Maori: a practical guide to traditional Maori medicine. Tauranga, New Zealand: Rob McGowan.

Planning and Designing for the Visitation of a Roman City Landscape – Tongobriga

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archaeological site | green structure | path network | scenic views

Freixo's Archaeological Site, located in the north region of Portugal, unveils the ruins of an ancient Roman city called Tongobriga. Classified as a national monument since 1986, it is widely visited. Currently the absence of infrastructure doesn't meet visitors' needs or the requirements of this landmark's potential attraction. Deficient accessibilities and the lack of signalization, parking places and visiting paths doesn't allow visitors to fully understand and enjoy this Archaeological Site. Totalling 123 acres, the landscape is very fragmented with no connections between the main ruin attractions, the village and the wider landscape context. This paper presents the research conducted to inform the planning and design improvement process of this landscape. Areas to visitor's reception, site knowledge and fruition were planned considering natural, cultural and touristic values, within a context of a continuous archaeological activity. Landscape connectivity was improved by green structure enhancement, preservation of the landscape mosaic, and promotion of native species regeneration. An interpretative landscape path network was designed to include an archaeological trail, a nature trail and a trekking trail offering diverse opportunities to visitors with resting areas and scenic viewpoints.

Introduction

Tongobriga – Location, History and Landscape

Tongobriga is an ancient Roman city located in the north region of Portugal, on Marco de Canaveses municipality (Figure 1). Its location in a valley near two important navigable rivers (Tâmega and Douro) allowed this civitas to thrive, becoming a stopping point of the trade axis between two Roman Empire capital cities, Bracara Augusta – Braga and Emerita Augusta – Merida.

Tongobriga was discovered in 1982, on Freixo village, being classified as a national monument in 1986 under the nomination of Freixo's Archaeological Site (FAS). Since then, archaeological activity has been taking place, disclosing remains of the Roman city dated from the 1st century BC to 5th century AD: sections of the defensive walls, thermae, domus, forum, domum, basilica, amphitheatre and necropolis. There are also vestiges of a Castro, a fortified pre-Roman village from 1st century BC, as well as some medieval graves from the Suevi (Dias 1997). Currently, Freixo is a small village equipped with a Museum, a Professional School of Archaeology, an Archaeological Laboratory and a Restaurant. The uniqueness of FAS owes to the successive temporal and civilizational layers that adapted to the specificity of this territory and to the remnants of previous cultures.

The landscape of Marco de Canaveses is strongly influenced by its geographic location. Embedded in the Portuguese Northwest hills, this is a region of moderate slopes, with plateaus and narrow fertile valleys where the wide views were strategic for the tactic control of the territory. The rainfall is abundant and the average temperature is high, generating optimal conditions for agriculture and for the survival of a high natural biodiversity. These were the ideal circumstances for the settlement of the people that first shaped this landscape by clearing the vast

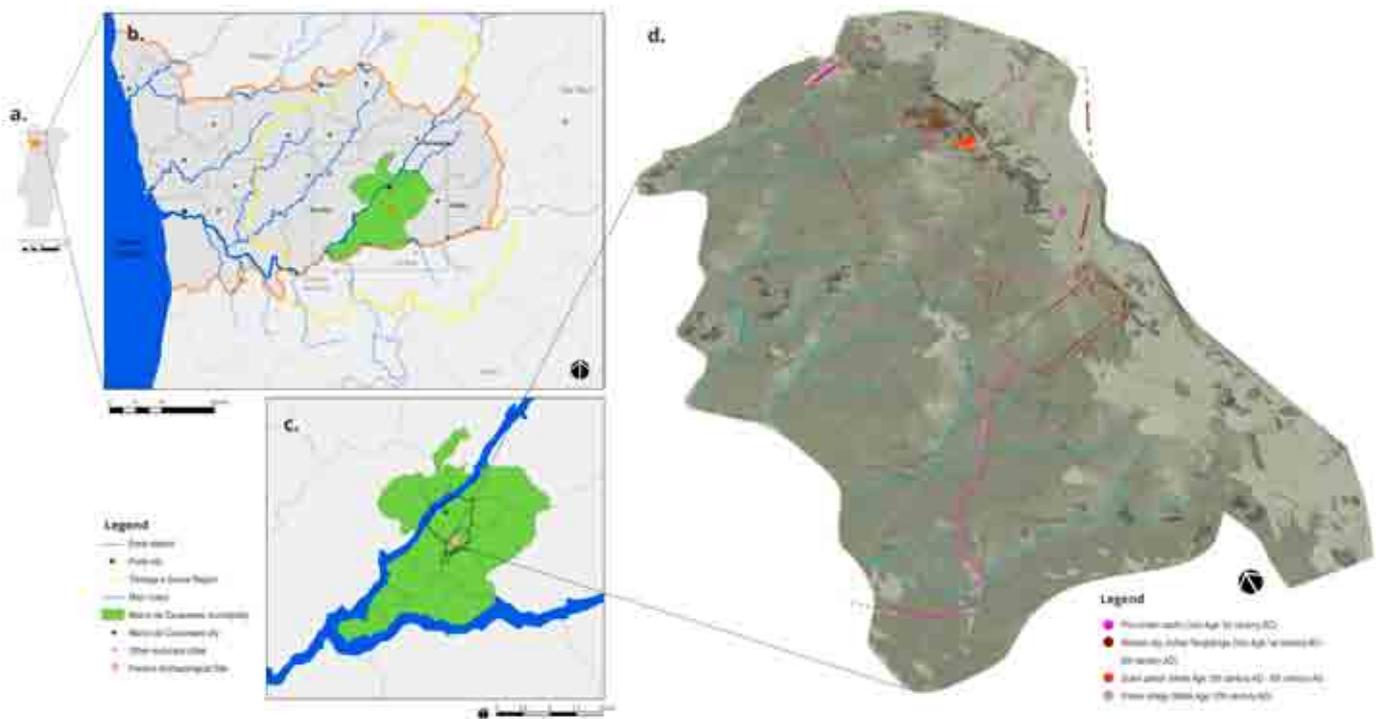


FIGURE 1. Location of: a) Porto district in Portugal b) Marco de Canaveses Municipality in Porto District c) Freixo's Archaeological Site in Marco de Canaveses Municipality d) Layers of human occupation in Freixo's Archaeological Site

woodland of oaks (*Quercus robur* and *Quercus pyrenaica*) and pine tree (*Pinus pinaster*) to cultivate, and build terraces to install vineyards.

Totalling 52,5 ha, plus 18 ha of protection area, FAS landscape is characterized by massive granite rocky outcroppings with scattered rupicolous thickets, occupying almost half of the area. Woodlands and cultivated lands occupy, respectively, 20% and 18% of the area. The village (houses and streets) represent 7% and the Archaeological remains 5% of the area.

The Problem, the Purpose and the Percepts

FAS is widely visited (around 15 thousand visitors per year), but currently it lacks some critical infrastructures to meet visitors' needs. The main problems relate to deficient accessibilities and lack of signalization, parking lots and visiting paths. There is no cohesion regarding functional areas and no connections between the main ruin attractions and the wider landscape context (Figure 2). Visitors frequently complain for more information, better conditions for visitation and wider paths. Additionally, there is an overall negligence with the green structure caused by the absent maintenance in private land (75% of total FAS) that allowed the spread of invasive species, such as *Acacia dealbata* with consequences at ecological level, fire security, climatic amenity and views.

The main purpose of this project was to inform the planning and design process, at distinct scales, ranging from the establishment of connections and visibility points with the municipality, to the micro design of the parking lot.

The percept's focus on:

1. Archaeological ruins preservation as a non-renewable cultural resource
2. Design considering ruins visibility, use and interest, not compromising future excavations
3. Preserve the landscape character and identity ensuring the sustainability of natural resources
4. Guarantee a multifunctional usage
5. Integrate FAS in its surrounding context emphasizing the importance of scenic views

Methodology

The study was conducted at two scales, the Municipality scale and Freixo's Archaeological Site scale, by following three major phases (Figure 3):

Analysis of main biophysical elements such as slopes, hydrography, solar exposition and green structure; and socioeconomic elements: land use, demography, heritage, road network, services, property of the land (private or public).

Synthesis, focusing on the identification of the landscape character, at the Municipality scale, and place value, at the FAS scale.

Proposal, addressing the connection of FAS with Marco de Canaveses Municipality and, at FAS scale, aiming functional areas enhancement and green structure improvement.

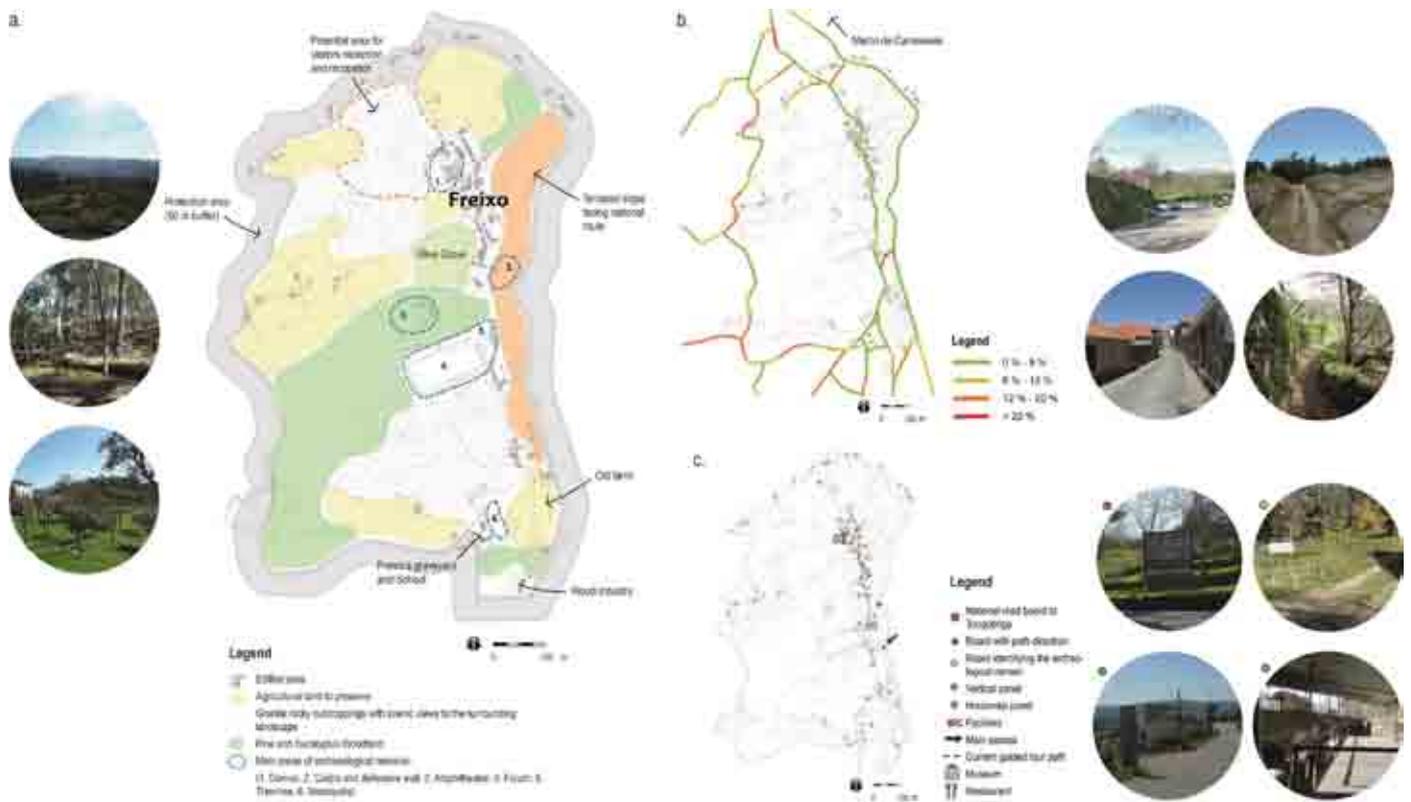


FIGURE 2. Current site conditions: a) Zoning b) Slopes of the accesses c) Signage and facilities.

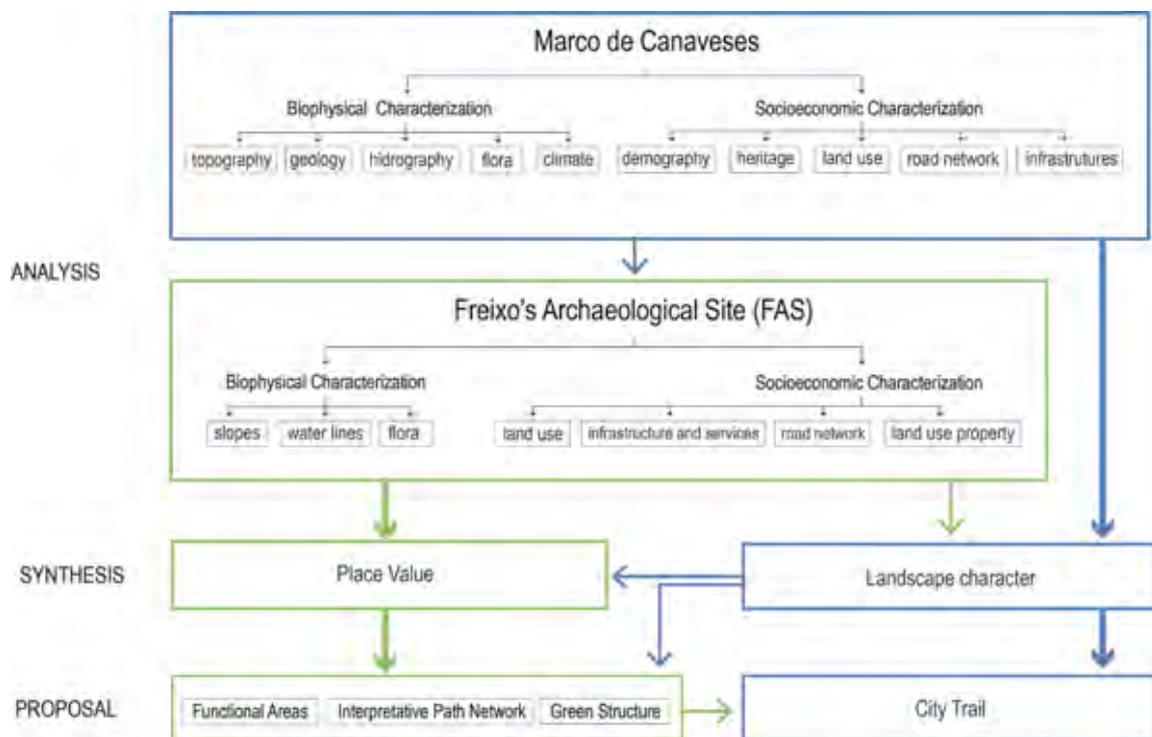


FIGURE 3. Methodology



FIGURE 4. Proposal for the visitation of the Roman City of Tongobriga at: a) Marco de Canaveses Municipality scale. b) Freixo's Archaeological site scale.

Planning and Designing for the Visitation of Tongobriga

At Marco de Canaveses Municipality scale

The connection between FAS and Marco de Canaveses was achieved with the design of a circular path - City trail, between the two sites (Figure 4a). Planned as a closed loop it links the city centre, the train station, the leisure park of the city, the church of the Divino Salvador de Tuías and the Roman circus, out of FAS.

At Freixo Archeological Site (FAS) scale

Functional Areas and Interpretative Path Network

The design for the visitation of Tongobriga was structured from the accesses to, and in, the FAS (Figure 2b). Two parking lots were proposed, one at the South and one at the North entrances, connected with strategic functional areas as the museum (improved to also serve as visitor centre) and scenic viewpoints, some with resting areas. In archaeological excavation sites it is proposed the replacement of the steel skeleton cover, by cellular polycarbonate in order to minimize the visual impact and allow a broader understanding of a roman city structure. Access to excavation sites were also improved by reinforcing some of current informal accesses.

The interpretative path network was based on the requalification of old trails, like the Decumanus Maximus, (main route of Tongobriga, east-west oriented, and currently

only accessible with the help of local inhabitants), as well as in the creation of new ones (Figure 4). Three trails with distinct characteristics and functions were designed: 1) an Archaeological trail, with 0,8km taking 15 min to complete ; 2) a Nature trail with 2km taking 30 min to complete; and 3) Trekking trail with 3,5km taking 50 min to complete. All the trails start in the museum and interconnect in the restaurant, in the church and in the parking lots offering diverse recreational and fruition opportunities to visitors and include information boards alongside the paths.

Green Structure

Landscape connectivity was improved by green structure enhancement based on 1) gradual eradication of invasive species, starting on the areas surrounding the main tourist attractions, 2) native species regeneration and 3) the preservation and promotion of the landscape mosaic emphasizing the roman influence with the inclusion of *Taxus baccata* along paths. It is proposed to re-established two important views by vegetation clearing in the amphitheatre, to enhance the topography reading, and between the forum and Castelinho, once a Castro and today a small but very sought chapel.

Final Remarks

The planning and design of archaeological sites is very complex, it demands attending to the number of players and the unpredictability of external factors, but it also is a critical instrument to guarantee the quality and multifunctionality of these landscapes.

Landscape is not reducible to territory, therefore landscape planning does not deal only with spatial features, but mostly with an intangible heritage. The main goal is not just to open views to display the archaeological ruins or to facilitate the landscape readability, but to bring man back and allow him to live this landscape and understand its close links with this territory.

Of foremost importance is to rescue the patrimony, as a collective basis of identity and a degradable resource (Nickens n.d.; Mosler 2006), especially in living landscapes like Tongobriga, where new fabric overlaps previous valuable and fragile layers and tend to occult or erase them.

References

- Dias, L. T. (1997). Tongobriga. Tese de Doutoramento. Lisboa. IPPAR.
- ICAHM (International Scientific Committee on Archaeological Heritage Management) <http://www.icomos.org/ica hm/>.
- Mosler, A. S. (2006). Landscape Architecture on Archaeological Sites – Establishing landscape design principles for archaeological sites by means of examples from West Anatolia, Turkey. Tese de doutoramento, Faculdade Técnica de Munique.
- Nickens, P. R. (n.d.) The Destruction of Archaeological Sites And Data.

Greening Brownfields with Open Space Strategies in Sakai City, Japan

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post industrial landscapes | green infrastructure |
 brownfields | environmental regeneration

Greening brownfields in Japan seems to be becoming more important recently, due to the changes of industrial activities with a shift from industrialisation owing to structural changes of the socio-economic conditions. There is a significant number of brownfields particularly in former industrial areas, therefore it is an urgent issue to consider its utilisation and management. The research question is to examine the effects of greening brownfields in Japan. This study aims to clarify the process of transformation from brownfields to open spaces for the public benefits, and to seek key factors to promote greening brownfields in Japan. The research method is literature reviews, and a case study of Greening Projects of the Waterfront in Sakai City. From the results of the case study, it became clear that open space strategy has been promoting greening brownfields by using master plans for parks and open spaces. The concept of Green Infrastructure (GI) is recently being introduced and examined for its potential in Japan, however it has not yet become a part of statutory requirements or authorised as one of the key planning tools. At present, master plans for parks and open spaces are adopted to take over functions of GI Planning in Japan.

Backgrounds

The importance of greening brownfields has been increasingly discussed in Japan in the face of deindustrialisation and structural changes of the socio-economic conditions. A better utilisation and management system is urgently required to deal with brownfields, particularly in former industrial areas. Definitions of brownfield, include land with existing, and potential of land contamination, according to the U.S., Europe and Japan (EPA 2002; CARBERNET 2005; Ministry of the Environment 2007; Takahashi et al. 2013). Contaminated land in Japan is estimated to be 113,000 ha (Ministry of the Environment 2007; Takahashi et al. 2013). According to an interim report by the Ministry of the Environment (2007), an area of land with contamination, which is considered to be difficult to be sold due to its high remediation costs, is estimated to be approximately 28,000 ha, that is nearly half of the area of Tokyo wards area.

The movement of environmental regeneration on brownfields can be supported by the concept of Green Infrastructure (GI) for being considered as potential use of such sites, since the loss of nature in urban and suburban areas due to urbanisation and industrialisation has become more evident. GI Planning has a role in sustaining the ecosystem services, as well as bringing out economic benefits for fulfilling multi-functionality (Ahern 2007). Previously damaged landscapes including contaminated brownfields, are seen as the potential sites for creating GI by 'interconnected network' of lands and water with ecological process to improve 'the health and quality of life' for 'communities and people' (Williamson 2003). Thus, environmental regeneration can also create impacts on community empowerment with local enthusiasm (Roe 2014). Although GI has been recognised as one of the key planning tools in US and Europe, in Japan, it is only recently being introduced and examined for its potentiality, it is not yet



FIGURE 1. Aerial photo of Waterfront in Sakai City and Sakai Greening Projects (Author: Osaka Prefecture)



FIGURE 2. Aerial photo in 1985, the site was formerly used for industrial activities (Author: Geospatial Information Authority of Japan)

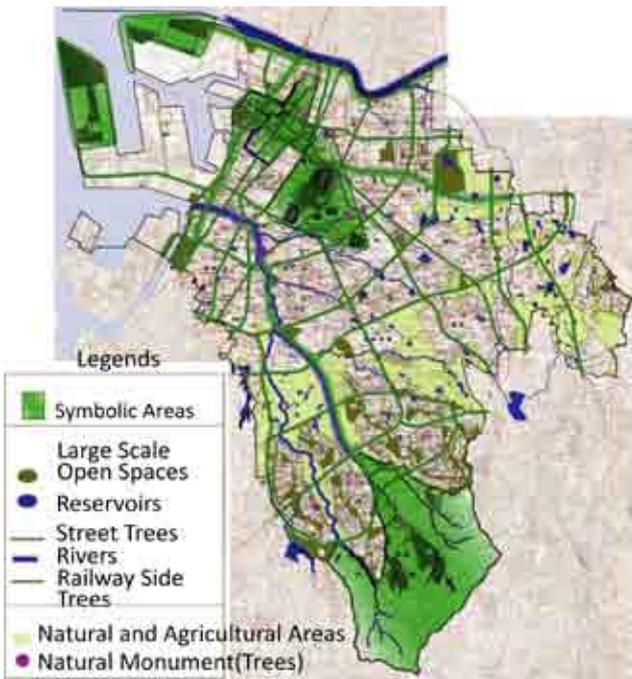


FIGURE 3. Diagram of future image of open spaces in Sakai City

included in statutory requirements, or authorised as one of the key planning tools. However, it is clearly stated to promote GI in the recently published Fifth National Land Use Plan (MLIT 2015), one of guidelines to prepare masterplans.

Study Methods

The research question is to examine the effects of greening brownfields in improving the urban environment in Japan. This study aims to clarify the process of transformation from brownfields to open spaces for the public benefits, and to seek the key factors to promote greening brownfields in Japan. The research method is based on literature reviews, and a case study of Greening Projects of the Waterfront in Sakai City which went through the transformation of a former landfill site and a former factory site.

Results from the Case Study

The Greening Project of the Waterfront in Sakai City has been planned since the 1990s (MLIT undated). It consists of several newly created open spaces of approximately 170.5 ha in total. It is located on the edges of reclaimed industrial areas facing to the Osaka Bay. It is within a designated zone for industrial activities and was a base for industrial and energy production during the 1960s and 1970s. However, recently, there has been increasing land uses of recreation and sports which have become evident (Figure 1 and Figure 2). It is clearly identified and designed to create new open spaces and to improve environmental quality in the Master Plan for Parks and Open Spaces published by Sakai City (Sakai City 2012) (Figure 3). There are three examples of open spaces in this project.



FIGURE 4. The site is now redeveloped into training centre for football⁴ (Author: Showa Sekkei)

The Communication Space with Sea (CSS) was the first public space in 2000 (Sakai City n.d.). It was a part of a former steel factory site (MLIT, undated) which has now extended to approximately 27.9 ha (Sakai City 2012). Since it is located in the far end of the Waterfront area, it was necessary to build new roads (Nippon Steel and Sumitomo Metal 2007). It could be evaluated as a good practice in providing good access and opening the industrial area to the public.

Secondly, the Symbiotic Forest, opened in 2004, was a part of a former reclaimed landfill site (Osaka Prefecture 2015) covering approximately 100ha (Sakai City 2012). Thirdly, J-Green Sakai (Sakai Municipal National Training Centre for football), opened in 2010, was a former gas work site covering approximately 42.6 ha (Sakai City, n.d.). It has natural grass and artificial turf football fields, futsal courts, and a club house which is the largest sport facilities in Japan (J-Green Sakai n.d.) (Figure 4).

From the examples, it is clear that environmental benefits have been achieved through these cases to improve the quality of the environment and to create new open spaces for the public. However, multiple benefits beyond narrowly defined environmental and physical improvement are yet not to be clarified (e.g. place-making, ecosystem restoration, climate change adaptation, culture and values, increasing land value etc.). Therefore, there is a future task to extend its benefits to multiple cases.

Conclusions

The key findings are as follows; 1) the creation of new large-scale open spaces can contribute to the improvement of the quality of the environment; 2) the case study sites are all located on the edge of cities which makes it difficult for the public to access and has therefore not been noticed by many people (Miyagawa 2015) and 3) the case study sites are limited to the industrial or recreational uses under Port and Harbour Act (2014) due to the Central Government led landuse-based planning system. Greening brownfields is seen to be contributing to the improvement of the urban environment and to the creation of new open spaces in order to provide solutions to increase the number of limited open spaces available in urban area. However, for the public benefits, the accessibility needs to be improved due to its location on the edge of the city as well as building partnerships with the community is urgently required to raise the awareness of benefits of using newly created green open spaces. It may also be important to extend the environmental benefits of GI to multiple benefits to create and manage local identity and culture of post-industrial landscapes as well as the wider contexts of environmental restoration.

It also became clear that open space strategy has solely been promoting greening brownfields by developing master plans for parks and open spaces. Since the concept of GI has not yet been recognised as a key planning instrument, master plans for parks and open spaces are currently adopted to take over the functions of GI Planning in Japan. There is a need for developing Government-led policies to promote the GI concept in Japan.

Acknowledgements

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References

- Figure 1: Aerial photo by Osaka Prefecture, Available at https://www.city.sakai.lg.jp/shisei/toshi/rinkai/vision_list_kakutei/vision_list_kakutei_pdf.files/vision_list_02_04.pdf#search=%E5%A0%BA%E5%B8%82+%E8%87%A8%E6%B5%B7%E9%83%A8+%E8%88%AA%E7%A9%BA%E5%86%99%E7%9C%9F, (accessed 1 September 2015).
- Figure 2: Aerial photo by Geospatial Information Authority of Japan, Available at <http://mapps.gsi.go.jp/maplibSearch.do>, (accessed 1 September 2015).
- Figure 3. Sakai City, 2012.
- Figure 4. Aerial photo by Showa Sekkei, Available at: <http://www.showa-sekkei.co.jp/en/project?id=217>, (accessed 5 November 2015).
- Ahern, J., 2007. Green Infrastructure for cities: the spatial dimension. In: V. Novotny and P. Brown, eds. *Cities of the Future*. London: IWA Publishing, 267-283.
- The Concerted Action on Brownfield and Economic Regeneration Network (CABERNET), 2005. Brownfield Definition. Available at <http://www.cabernet.org.uk/?c=1134>, (accessed 1 September 2015).
- European Commission, 2015. Green Infrastructure, Available at <http://ec.europa.eu/environment/nature/ecosystems/>, (accessed 1 September 2015).
- J-Green Sakai, undated. Available at <http://jgreen-sakai.jp/outline/>, (accessed 5 November 2015) (in Japanese).
- Ministry of the Environment, 2007. An interim report on present conditions of brownfields issues regarding on land contamination. Geo-Environmental Protection Center, 1-31 (in Japanese).
- Ministry of Land, Infrastructure, Transport and Tourism (MLIT), 2015. The Fifth National Land Use Plan. Available at <http://www.mlit.go.jp/common/001100246.pdf>, (accessed 1 September 2015) (in Japanese).
- Ministry of Land, Infrastructure, Transport and Tourism (MLIT), undated. Available at <http://tochi.mlit.go.jp/chiiki/land/ex20/1579/>, (accessed 13 November 2015) (in Japanese).
- Miyagawa, T., 2015. J-Green Sakai, City Planning Review, The City Planning Institute of Japan, Vol.64. No.3, 22 (in Japanese).
- Nippon Steel and Sumitomo Metal, 2007. Available at http://www.nssmc.com/company/publications/monthly-nsc/pdf/2007_6_169_01_06.pdf#search=%E5%A0%BA%E6%B5%9C+%E9%81%93%E8%B7%AF%E6%95%B4%E5%82%99+%E6%B5%B7%E3%81%A8%E3%81%AE%E3%81%B5%E3%82%8C%E3%81%82%E3%81%84%E5%BA%83%E5%A0%B4, (accessed 19 November 2015), (in Japanese).
- Osaka Prefecture, 2015. Available at <http://www.pref.osaka.lg.jp/midori/midori/kyousei.html>, (accessed 13 November 2015) (in Japanese).
- Sakai City, 2012. Master Plan for Parks and Open Spaces of Sakai City, Available at <http://www.city.sakai.lg.jp/shisei/gyosei/shishin/sangyo/midorikihon/mplan/index.html>, (accessed 13 November 2015) (in Japanese).
- Sakai City, undated1. The Communication Space with Sea, Available at <http://www.city.sakai.lg.jp/shisei/toshi/rinkai/umifureai/>, (accessed 19 November 2015), (in Japanese).
- Sakai City, undated2. No.13 Sakai Municipal Soccer National Training Centre, Available at https://www.city.sakai.lg.jp/shisei/sonota/kansa/kansakajokyo/hokatsu/21331kansa23.files/hk210331_23_13.pdf#search=%E7%AC%AC13+%E5%A0%BA%E5%B8%82%E7%AB%8B%E3%83%8A%E3%82%B7%E3%83%A7%E3%83%8A%E3%83%AB%E3%83%88%E3%83%AC%E3%83%BC%E3%83%8B%E3%83%B3%E3%82%B0 (in Japanese), (accessed 13 November 2015).
- Takahashi A., Abe, H., Otsuka, N. and Miyagawa, T., 2013. Legal framework and estimated stock measurement on brownfield as contaminated land in England and Japan. *Journal of Architecture and Planning*, Vol.78, No.687, 1077-1085 (in Japanese).
- US Environmental Protection Agency (EPA), 2015. What is EPA Doing to Support Green Infrastructure?. Available at http://water.epa.gov/infrastructure/greeninfrastructure/gi_support.cfm (accessed 1 September 2015).
- US Environmental Protection Agency (EPA), 2002. Small Business Liability Relief and Brownfields Revitalization Act. Public Law, 107-118 (H.R. 2869).
- Roe, M., 2014. Exploring future cultural landscapes, in *New cultural landscapes*. In: M. Roe and K. Taylor, eds. Abingdon: Routledge, 241 -269.
- Williamson, K. S., 2003. *Growing with Green Infrastructure*. Doylestown: Heritage Conservancy.

Transiting Cities: Mediating Change for Uncertain Futures

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urban regeneration | tactical urban actions | urban agency | interdisciplinary |
landscape urbanism | urban resilience | intensify | re-use | re-purpose

Regional Centres in Australia were historically developed as a network of productive hubs of industry and agriculture in service of the Metropolitan Centre. As such, these Regional Centres dominated by singular economies are in a state of massive change that is most often manifest as decline giving rise to social, economic, and ecological issues.

Change has been driven by a range of factors, for example Globalisation as a process of international integration that has undermined the productive integrity of these centres primarily through shifts in the commodities and labour markets, and the privatization of traditionally Government operated industries and infrastructure significant to each Regional Centre. The result is that the relationship between the metropolis and the regional city has become disconnected, leaving regional areas to become stranded assets.

At the regional and urban scales the productive heart as we knew it no longer contributes to the urban and social fabric as it once did, and simultaneously the Metropolis is no longer so dependent on the Regional Centres and has in many ways cut them adrift.

In the face of this uncertain future possibilities emerge for the transition of these urban centres into something different that both celebrates and utilises their industrial heritage to develop into something new, offering firstly much need stability to the community, yet more importantly the tools and capacity for productive transition.

Through the careful dissemination of our own work the paper explores how a landscape design approach is utilised to catalyse and enable change through transition in the urban fabric to inform long term strategic urban regeneration. This includes a change in design approach effecting policy, planning and identity that moves beyond the efficient and reduced risk of top-down urban design policy, and instead engages with the regional as a place for community with an inherent capacity for change.

This work considers how cities are dynamic complex systems in a constant state of change resisting conventional modes of planning. The paper develops ideas of how productive social, economic and environmental dimensions can emerge from a combination of bottom-up and top-down approaches, and how a multiplicity of design actions across a range of physical and temporal scales in collaboration with numerous assorted agents, stakeholders and disciplines is an approach for stabilisation and reconnection whilst accepting the unpredictability of future scenarios.



FIGURE 1. Get Sunflowered, Moe, Australia 2014-15



FIGURE 2. Get Sunflowered Easter Egg Hunt, Moe, Australia 2014-15

Introduction

Landscape is a state of flux, it is the 'functioning matrix of connective tissue that organises not only objects and spaces but also the dynamic processes and events that move through them'.⁰¹ The dynamic nature of change is not simply restricted to its more traditionally categorised materials and conditions but extends at the very least to embrace the matter of politics, culture, economics, and technology.

Landscape Architecture practiced in the cultivated landscape of the urban fabric represent the most complex interface of these matters. It is through this dynamic state of change that the distinction of boundaries and gaps is blurred offering new opportunities for engaging, and perhaps different ways of practicing.

The 'Transitioning Cities' research projects conducted by the OTR Laboratory explore how a landscape design approach is developed to catalyse and enable change through transition in the urban fabric to inform long term strategic urban regeneration. This includes a shift in design approach to effect policy, planning regimes, and civic identity that move beyond the reduced risk of top-down urban design strategies, towards the landscape as an agent inherently capable of change over time with multiple stakeholders at a range of scales. This position has been essential to the development and application of interdisciplinary techniques and methods that explores *transition* as a condition of continual change rather than an over simplified 'before and after' binary scenario.

This work considers how cities are dynamic complex systems in a constant state of change resisting conventional modes of planning. It is the development of how productive social, economic and environmental dimensions can emerge from a combination of bottom-up and top-down approaches, and how a multiplicity of design actions across a range of physical and temporal scales in collaboration with numerous assorted agents, stakeholders and disciplines is an approach for stabilisation and reconnection whilst accepting the unpredictability of future scenarios.

What emerges is the challenge to the discipline to embrace the essential dynamic of change that is implicit to the notion of the landscape as a complex 'functioning matrix'. In the first instance this requires development beyond largely static notions of design to a consideration of design through an adaptive 'framework', able to respond over time to unknown forces. In the second instance, the opportunity exists for Landscape Architects to act as 'curator' beyond the sphere of a project, and operate in the larger conversation to act as a cultural agent of change.

These modes of practice are offered as extensions of the discipline enabled by the current skill sets of landscape architects and simultaneously fuelled by the social, political, ecological, and technological developments of contemporary culture. A very real aspect of both proposed modes of practice is the possibility that the future of any works undertaken in this manner may include our own redundancy. This is not intended as a frightening prospect rendering the Landscape Architect superfluous, for it is precisely the contrary, offering instead real currency to practice.

Freshkills Park, Downsview Park, and Park Van Kraal projects offer moments in which landscape architects have attempted to engage with the dynamic condition of the landscape in order to challenge the practice, and proffer design outcomes as a different, and perhaps better way of living in the world that celebrates change through their capacity to adapt.

Each project proposes a responsive and adaptive framework that unfolds over time in relationship to its contextual environment, however of the three only Freshkills Park continues to exist, grow, and change, while others have been either wilfully eradicated, or simply faded into obscurity.

What these projects share is a designed framework that guides and shapes their development of over a long period of time. These projects do not fix, define, or prescribe a definitive outcome, rather they contain a set of constraints encoding the idea of its making by which each project can respond to



FIGURE 3. Get Sunflowered, Traralgon, Australia 2014-15

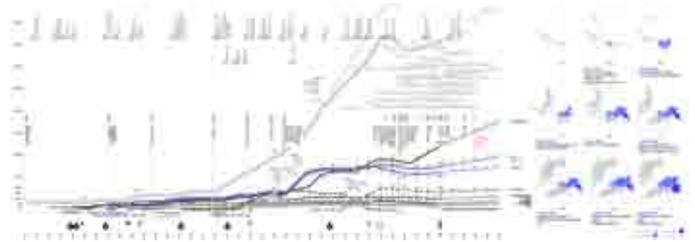


FIGURE 4. Latrobe Valley Timeline + Forecast Mapping

needs, demands, and create opportunities over time. These projects should not be confused with 'staged' works in which each stage is itself defined as a fixed isolated component of a pre-determined outcome, most often developed in response to structural conventions or economic forecasting, in which little flexibility exists, and change is recognized and evidenced as a catastrophic moment in which the entire project must be re-evaluated, effectively jettisoning the previous proposal for a new one.

Each project demonstrates a making process through variable forms of controls and constraints that respond and direct the form of the work's becoming. They also each evidence very different conceptual ideas that inform their making processes; Freshkills constructed a diagrammatic succession model, Downsview Park was framed through the rules of a game that prioritised programme, and Park van Kraal was ordered through an instruction manual defining rules of engagement.

The approach of practices like STOSS through current projects in Detroit and New Orleans, both cities in a state of massive change, evidence developments in a practice of 'design frameworks' that rigorously organises 'ground-up' community capital with local industry and government in inclusive productive partnerships. These works may offer some insight as to the failure of the aforementioned projects as the physical spatial outcomes are considered as an equal part of the larger social, economic, and ecological aspirations of the work. This is not because Downsview Park and Park van Kraal did not aspire to catalyse change in and beyond only their physical manifestation, for the inverse is true, but perhaps what the work of STOSS offers is a greater inclusion of all aspects of contemporary living. In each of these projects the Landscape Architect is evidenced to have played an expanded role as 'curator' through the product of a 'design framework'.

Transitioning Cities

Transition to a low carbon future for an energy resource landscape will inevitably lead to striking changes that will be far reaching. The spatial changes will not simply be the closure of

facilities (the coal mines and power stations) or the integration of new technologies as it will require a complete reorganisation at the local, state and national scale. Impact will be measured through local physical reconfigurations of the urban environment and simultaneously at the state and national scale in the relationships between the main historical supply sources and demand areas. Energy is a basic human requirement which is profoundly interwoven in society, culture, economy and the environment. This tightly integrated and interwoven necessity and behaviour consequently requires the entire fabric to be reconsidered.

Transition is imbued from the onset with uncertainty and unpredictability from political and economic forces that are continually at play. Transition needs to take on broad operations at multiple scales through a qualitative perspective of the landscape rather than purely quantitative measures of supply and demand. An adaptation of the singular metropolitan centre and outlying regional service cities is brought into question and so too is the infrastructural landscape that supports these urban areas.

Mediating Change

The transition of cities requires a dual focus, that of the reformation of the supply and demand systems, and simultaneously a consideration of the physical landscape. In this scenario energy is the catalyst for the transformation and reorganisation of how we consider urban settlements and its constituent parts. An approach which is bipartisan and collective is evidenced as a need to consider the historical events that informed its current being, and as a mechanism for mediating and responding to uncertainty. Change cannot be delivered by any one singular entity or policy, but requires the work of many in the short, medium and long term.

Through an understanding of the complexity of the Latrobe Valley landscape as towns established on a singular industrial economy intertwined with excessive cultural and historical baggage generating an attitude of deep mistrust - especially toward 'external experts' - it was decided that our initial

volley into this space would be the establishment of an international design competition titled 'Transiting Cities'. Through the development of the competition brief we shifted our role to operate as a collective agency creating a platform for engagement in which stakeholders are recognised, connected and enabled to generate potentials for action. From this 'neutral' curatorial position we were able to turn the focus back onto the stakeholders making it possible to bring to bear invisible processes and opportunities in the landscape, and simultaneously return ownership of the issues to them so that they might play an active role in their future. Within the scaffolding of the competition this collectively generated the parameters and measures to inform and judge the outcomes.

From the outset it was our intention to open up the discussion by breaking down barriers, describe back to the community the issues and potentials that they themselves had identified, position this within a global discourse to evidence to the local community that they were not the only community in the world experiencing massive change, and that they might borrow and contribute to this challenge. In our capacity of landscape architect as curator we were able to work across disparate entities and engage with unpredictability to draw forth opportunity and apply a knowledge that the landscape itself is adaptable component able to reform relationships of production and consumption.

Building on the success of this work, the Future Morwell project was undertaken to specifically explore the revitalisation of the Morwell township in the Latrobe Valley. In contrast to the ineffectual collection of bubble diagram static masterplans that nested on the shelves of the local government Council offices, the work produced a design framework that is able to continually remake the image of the city. It is a collective instruction for adaptation and enduring negotiation, framed through clear aspirations and measures, and short term achievable actions as catalysts for long-term change. In producing this work, the landscape architect is curator, director, and puzzle maker.

The prolific studies, mappings and simulated testing of scenarios generated through the work of these projects in conjunction with the wealth of community capital that was uncovered through this process created another project opportunity as a happy opportunistic by-product. The Get Sunflowered project was born from parallel issues; a recognition of a growing number of redundant vacant sites collecting the detritus of urban life, a fragmented community unable to recognise its own potential to contribute to reshaping the future of their own towns, and a community rendered despondent to the many long term project promises that never materialised. A host of sites was selected in consultation with the local community and negotiation with the predominantly non-local landowners secured their occupation. Each site unfolded over time as a series of events - clean up, planting, maintenance days, watering, harvest party - engaging a diverse collection of local community volunteers supported by local industry and business. These were not generic fields of flowers but designed sunflower spaces unique to each site promoting a spatial engagement as much a visual feast. The neglected

public sites were transformed into golden fields of sunflowers culminating in harvest parties attracting thousands of people, supported by local bands and entertainers, restaurants, and businesses. Everybody of course walked home with massive bunches of sunflowers given free to the public. The beautiful sunflowers were themselves a happy by-product of the work that brought the fragmented community together, and helped them understand how they themselves could be active agents for change within the uncertainty of the region's transitioning.

Following the overwhelming success of the work and the ever growing public enthusiasm supported by local industry, and now local government, the project has continued into its forthcoming third year of proceedings. As capacity within the community itself grows to manage and ultimately own the project the landscape architects as the drivers of the work will themselves become redundant, which is itself the important step in the work, as it is the real measure its success.

Conclusion

The work celebrates the capacity for change that is the imminent condition of the landscape medium attempting to understand how this might be utilised in design, and contribute to the discourse of landscape architecture. The aspiration is to learn from the landscape's inherent dynamic nature of change to continually remake itself, to work with and through this condition, to borrow and adopt from its capacity to generate change, and inform a potential landscape practice that engages with contemporary complex systems and forces that inform it in order to connect, promote and instigate relationships in a dynamic shifting context.

The inquiry defines, and draws upon, an understanding of the medium of landscape as a condition of dynamic relational change. Time is the vehicle for change characterised as 'a destabilising but creative milieu; it is seen to suffuse everything, to bear each thing along, generating it and degenerating it in the process'. As a product of its responsive nature the landscape is continually re-made, and consequently the matter of its being is constantly re-defined. This condition is fundamental to the exploration of landscape design as an activity of continual making representing new possibilities for the engagement of landscape architects.

References

1. Kwinter, Sanford, "Landscapes of Change" in *Assemblage* (19), Cambridge, Massachusetts, The MIT Press, 1992.p. 52
 2. Wall, Alex, 'Programming the Urban Surface', in 'the Landscape Urbanism Reader' in Corner, ed., 'recovering Landscape p. 233
- Corner, James, *Recovering Landscape: Essays in Contemporary Landscape Theory*, New York, Princeton Architectural Press, 1999.
- Lister, Nina-Marie & Reed(editors), Chris, *Projective Ecologies*, New York, Actar/harvard School of Design, 2014.
- Sassen, Saskia, *Expulsions: Brutality and Complexity in the Global Economy*, Cambridge, Harvard University Press, 2014.

Landscape Architecture in elop* Transdisciplinary Projects

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elop* alliance

transdisciplinarity | urban project | collaboration | landscape architecture |
co-design | ecosystemic project | immersion | affinity |
ideation | communication | pedagogy

The actual challenges of urban development require us to step out of the traditional disciplinary boundaries and to use different cultural backgrounds for a new type of project. The elop* project is a learning, teaching and research programme that offers transdisciplinary methods and tools to act in the field of the built and social environment. elop* is heading towards a collaborative and holistic solution and is implementing an eco-systemic approach.

elop* (environment-focused learning and operative platform) is an academic programme shared by 8 renowned higher education universities (elop*alliance) who have worked together since 2009. The main goal is to promote a systemic approach in the process of designing a project. (see Figure 1)

elop* runs annually during a semester and has taken place in Switzerland, China, Germany, USA, Mexico and UK with a scope on various relevant questions in the field of built and social environment. The award-winning programme is led and coordinated by the Bern University of Applied Sciences.

hepia Haute Ecole de Paysage d'Ingénierie et d'Architecture, Geneva is part of the elop*alliance network since 2011 with a team of landscape architects. hepia took the responsibility for the organization of the 7th elop*project in 2014/15, setting a focus on the development of the Alpine Region around Finhaut, Switzerland.

The Project Process

elop* creates a new transdisciplinary approach which addresses complex current challenges. This is achieved through the unique cooperation of different academic disciplines and stakeholders. Students have been working on realistic projects such as the Otra Banda Neighbourhood project (Participatory urban project in Queretaro, Mexico (elop*8), a bottom-up rehabilitation in the outskirts of the old city centre (World heritage site - Unesco).) inside a transdisciplinary team. The challenges for the students are to start working on a common ground:

They have different ways to consider the proposed area because of their various academic backgrounds: for example, landscape architects may be inclined to observe the non built-environment at a large scale; the architects may be inclined to focus on built elements and materiality. On the other hand, the sociologists

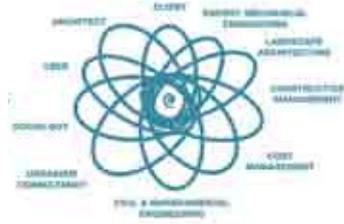
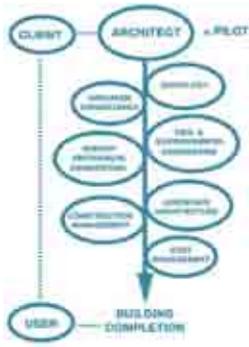


FIGURE 1. The Transdisciplinary Project. Source: elop*
The elop* approach introduces a paradigm change: from a linear process operating in silos into an integrative systemic process.

FIGURE 2. The creative and iterative cycles: IMMERSION
Source : elop*

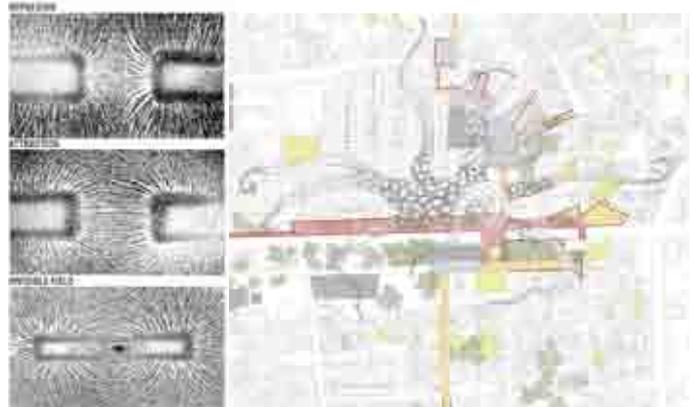


FIGURE 3. The creative and iterative cycles: IMMERSION
Source: elop*

FIGURE 4. The creative and iterative cycles: IMMERSION
Source: elop*

may work at a more human related level and identify multiples stakeholders and users with their interconnections.

The pedagogy of the programme is based on the creative and iterative cycles. These cycles are leading to a better design thinking approach (Rittel 2013) and are structured in five distinct steps, which are:

- Immersion: it is the common experience as the groups stride through the site and collect the variety of sensibilities and expertise's. (see Figure 2)
- Affinity: it is where the groups have to find "a common profile" out of the previous observations: it means that the students extract the essence in the very large panel of their observations. The process does not imply to choose one idea among many others but to associate them and to identify their affinities. (see Figure 3)
- Ideation: it is the search for new perspectives on familiar ground. This can lead to the emergence of metaphors such as the site as magnetic fields or as a chillipus. A concept can emerge such as urban-pockets or specific uses such as agri-tourism... (see Figure 4)

- Prototype: it is the next crucial step. This is the first draft of the project. It is the expression on the operational level of the new perspective, which emerged during the ideation step. (see Figure 5)
- Communication: it is the story telling of the project. The students present the most important steps that lead them to the prototype and the components that make the project. They are encouraged to use evocative words to create images in people's mind. In the project in Queretaro, Mexico (elop*8), a group consider the neighbourhood as a house with different rooms. Each room was suggesting a way of living in the space: for example the refreshing place (the bathroom) was considered as a shadowy square with a water fountain. (see Figure 6)

We encourage the students to be creative and use a various panel of tools, such as sketches, models, drawings and also sounds records, role game, story telling, mind maps, interviews. The use of these different tools is not only about elaborating the project, but also finding a common understanding beyond the disciplinary fields.

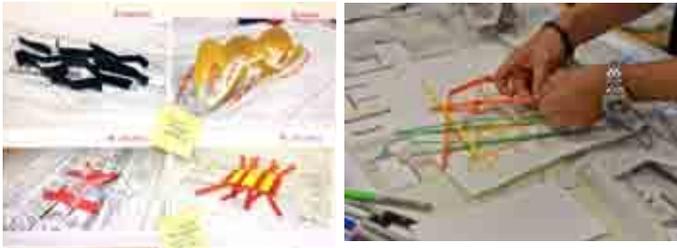


FIGURE 5. The creative and iterative cycles: PROTOTYPE
Source: elop*

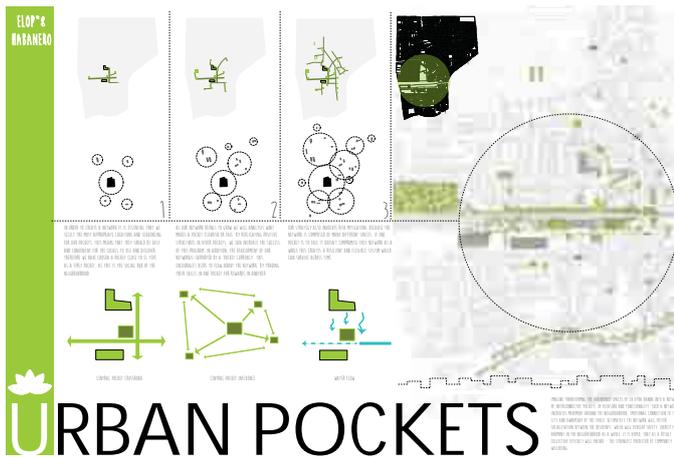


FIGURE 6. The creative and iterative cycles: COMMUNICATION
Source: elop*

The Fundamental Roles of the Landscape Architects

Landscape architects play a fundamental role. Like architects, the landscapers are used to the project approach, the conceptual way of thinking and the drawing tools.

The territory: the landscape students decipher the geomorphology of the site and the major landscape units at different scales. A landscape unit is the combination of various natural (soil, landforms, structure of the vegetation etc.) and anthropic elements (parcel structure, low walls, built heritage etc.). The site is considered in its historical dimension so that its development could stay coherent and keep its identity. The students work simultaneously at large territorial scale (*grand paysage*), at neighbourhood level and at the level of the public space.

The design of the open space: the project should enhance the quality of the public life. The project also has as to allow for a mix of uses and different atmospheres.

The ecology: should consider the open space as a chance to balance the impacts of the built environment; for example to thicken the vegetation, let the water leach into the soil, foster biodiversity and create biodiversity reservoirs. The goal is to create a large ecosystemic network.

The role of the landscape architects is to share this ecosystemic approach and to raise an awareness in the team. This should provide a strong basis for a sustainable and coherent development of the site.

The Better Recognition of Transdisciplinary Challenges

In the realization of their project, the students offer their expertise and are exposed to other fields of expertise.

From architects, they learn to think, from the beginning, in terms of concept. Architects always start the project with a concept (and not with the dynamic parts of the site). They are able to define forms, functions and typologies, it means to classify, distribute, and prioritize the elements of a programme. The programme is the specifications of a given project (school, housing project, museum, etc.). As they are working with architects, they realize the need to define a precise and a clear framework for their project.

From sociologists, they learn always to think about the needs of the future users and the expectations of all stakeholders. They co-design a participatory process. Considering landscape and public space as a core element of the city design, they can help to reach a consensus.

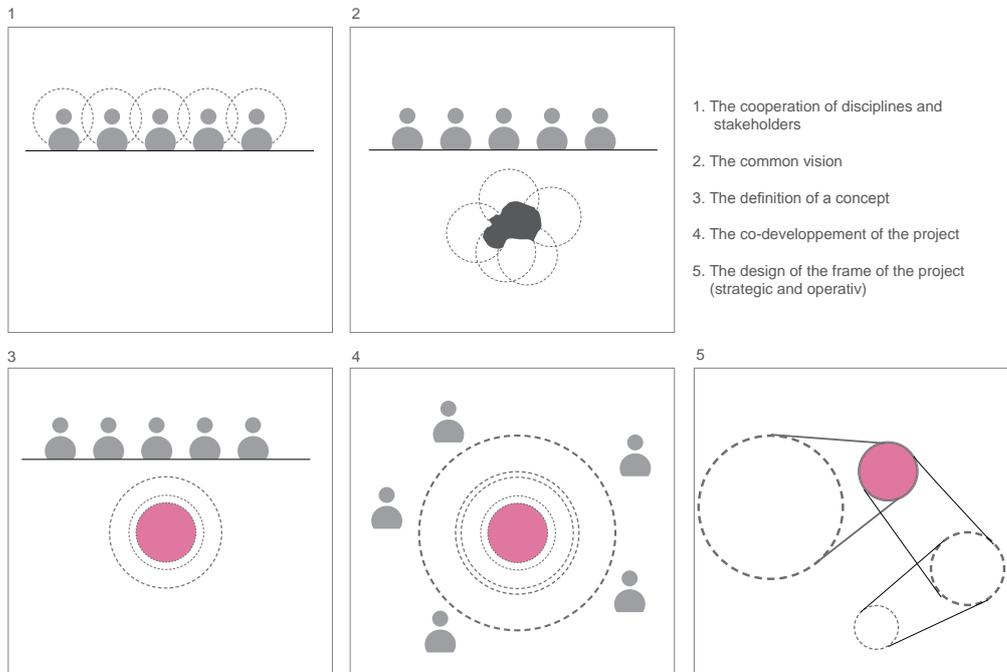


FIGURE 7. The «eco-systemic project»
Source: Nathalie Mongé

From engineers they get, very early in the project, technical specifications and opportunities in terms of energy efficiency and suitable materials that impact the design of the project in a crucial way.

This broader context of know-how opens up the field of landscape architect's education. These interdisciplinary perspectives help the profession to get ready for the new challenges.

The «Eco-Systemic Project», an Alternative to Bridge a Gap

With that holistic understanding of the complexity, the project can be understood as «eco-systemic project». The elop* approach introduces a paradigm change: from a linear process operating in silos into an integrative systemic process. Each discipline can value its collaboration as part of the co-designing process of an ecosystem. (see Figure 7)

The student realize that the given project doesn't have a unique solution. They rather have to draw a well structured frame. Inside this frame, the project can take its full shape. The process has to be clear for everyone: it has to be well design, inclusive, operational, flexible and effective.

The transdisciplinary approach of elop* help to “bridge the gap” between disciplines like the architecture, the sociology, engineering, and also urban planning, the arts, marketing, creative economy etc.

References

- Thinking design: Transdisziplinäre Konzepte für Planer und Entwerfer / Horst W.J. Rittel; neu hrsg. von Wolf D. Reuter ... [et al.]. - Basel : Birkhäuser, 2013.
<https://www.facebook.com/bfh.elop/>
 elop*8 <https://vimeo.com/161648984>
 elop*7 <https://vimeo.com/128532009>
 elop*6 <https://vimeo.com/86434037>

Visual Methods in Landscape Architecture Research

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visual research methods | perception | realm of experience |
reconstruction | constructivism

Using visual methods would be one response to challenges of inclusive designing and consensus-building in socially heterogeneous environments. The question then is how can visual means help supporting and enhancing communication about landscape (Kahila 2006, Ruggeri 2013). This paper aims at demonstrating the relevance of visual methods for gaining a better understanding of multiple perceptions and constructs of space and landscape, and also of people's wellbeing. The presented example shows how members of ethnically diverse community gardens in New Zealand use Polaroid photographs to communicate about landscape values. The assumption is tested that visual representations of landscape help bridge transcultural communication barriers.

Research Questions and Concepts

Two research questions are (a) how landscapes are perceived and meanings of landscape constructed by people with different landscape interest, and (b) how learning about different perceptions, meanings and values may inform landscape designing, planning and management. Planning for and designing of space and landscape are highly dependent on information exchange and discourse. According to social constructionist theory, all human experience is socially constructed. Place, space and landscape in particular (but also nature, heritage, wellbeing, etc.) are understood as 'social constructions of reality' (Berger and Luckmann 1966). Discourses are understood as people using signs, words and other utterances (including images) that they relate to objects and practices in a contingent manner. As persons and groups are interacting in social systems they create, over time, ideas and mental representations of their environment and of each other's actions in it. These include traditions, customs, shared values, interrelated practices and routines (Gailing and Leibenath 2015). From a social constructivist point of view we define landscape by (a) the interaction of the human and non-human, and (b) the human perception of the resulting material phenomena, i.e. features and processes (Wylie 2007: 7). Both can be visually communicated. Since each area carries multiple meanings "that emanate from the values by which people define themselves" (Greider and Garkovich 1994: 1) landscapes may be studied with respect to all kinds of cultural and social practice, including symbolic representation, memory, etc.



FIGURE 1. Taking and discussing Polaroid pictures

Methods

In this section, we explain how existing visual research methods are adapted, from different social sciences, to be used in studies that aim at better understanding (i) multi-perspective perception processes and (ii) mental constructions of space and landscape, and also of wellbeing. Various studies indicate that visual methods are more promising in understanding emotional attachment processes and mental constructs. While pictures and drawings in general seem to facilitate communication processes between researcher and participants, a combination of interviews and visual methods is very promising in gathering tacit knowledge and elicit information from persons, which could not be communicated verbally (Collier 1957). Visual research methods can unfold their full potential, when participants are equipped with cameras and take pictures of meaningful spaces and places from their perspective (Briggs, Stedman & Krasny 2014: 114). Individual experiences can be reconstructed and interactions between realm of physical space & time objects and realm of experience can be understood (Tidball 2012).

Building upon these studies, a multi-method approach was developed for the presented study about community gardens in New Zealand, which incorporated semi-structured interviews and a Polaroid technique. As existing photo methods lack the component of immediate feedback, instant cameras were given to the interview partners to overcome this limitation. First, semi-structured interviews were conducted in the communal greening projects in order to reveal personal details about the gardeners. Several questions about the individual motivation to participate, experienced benefits and long-term perspective of the gardens were included. After the interviews were completed, Polaroid cameras were handed over to the respondents and they were asked to take pictures of the most important elements in the gardens. Furthermore, the participants were requested to write keywords on the developed Polaroid pictures, which reflected their emotions and feelings.

The interviews were recorded with a Dictaphone and transcribed, while the pictures were sorted and categorized

regarding social, physical-material and symbolic-representative aspects.

After the analysis of the interviews, the resulting information was synthesized with the results from the Polaroid interpretation.

Setting of the Study and Application of Methods

Two devastating earthquakes struck the city of Christchurch, on the Southern Island of New Zealand, in 2010 and 2011, which resulted in massive damage and displacement of inhabitants. While the public authorities focused on rebuilding urban infrastructure, the civilian population expressed their needs for recreation of urban atmosphere, new purpose of life and sense of community (Wesener 2015). These desires had a strong impact on the local community garden scene and existing community gardens. Furthermore, it led to the creation of new post-earthquake garden projects throughout the city. These garden projects are platforms for activating social capital and fostering social cohesion (Hosted 2013) and represent bottom-up approaches for coping with the new 'landscape of fear', which was shaped by the natural disasters (Walsh 2011).

The gardens are visited by ethnically diverse people from all over Christchurch and include New Zealanders of European descent as well as Maoris. In this setting, it was important to understand how the physical-material dimension of the gardens would lead to specific social interactions and furthermore translates to symbolic-representative values.

The mixed methods approach was applied in ten community gardens throughout Christchurch and in one expert interviews. (Figure 1)

Findings

The presented study underpins, that social cohesion and skill transfer are vital benefits of community gardens. Furthermore, the production of fresh and healthy food is part of the motivation to participate in communal greening projects. The aspect of creating space and dealing with space was also an important aspect for taking part in a garden project.

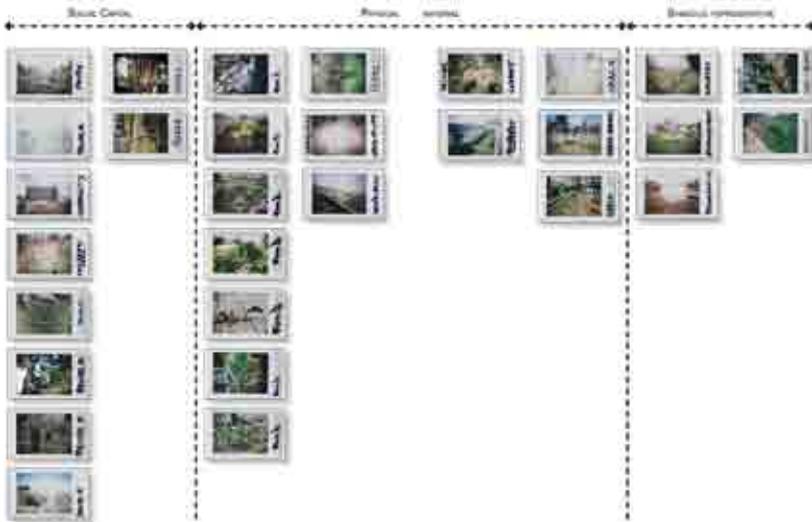


FIGURE 2. Sorted and categorized Polaroid pictures

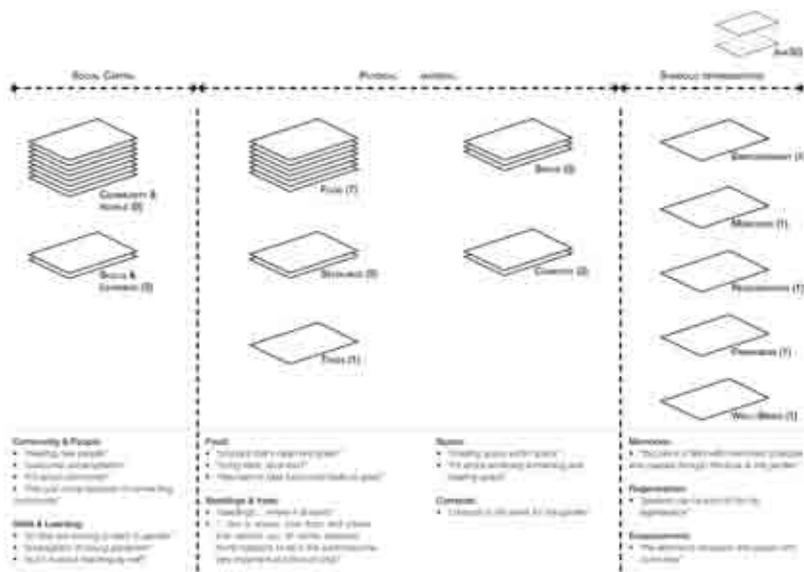


FIGURE 3. Synthesis of results from interviews and visual method

The research revealed that many physical elements embody emotional experiences or bonds, as well as deeper symbolic meanings. The produce, as fruits of the collective labour, is associated with freshness and quality of life. Allotments represented a way of empowerment, while other plots awake memories of former garden members. Community gardens in general were even regarded as tool for city regeneration. (Figures 2-3)

Discussion und Conclusion

Aiming at demonstrating the relevance of image based methods for doing research, visual representations of landscape are discussed in this paper. The presented example stresses the fact, that pictures and images “can trigger response that might lie submerged in verbal interviewing“ (Collier 1957: 854).

The comparison of the results from the interviews and the interpretation of the Polaroid pictures indicates that visual methods seem to be good choices for gathering explicit and tacit knowledge. Gardens and landscapes are enriched with meanings and emotions, which define the individual mental representations to large extent. Visual images are very useful to support trans-cultural communication. Using images for communication has a long tradition in landscape architecture. However, by providing the opportunity through research to express non-expert views on landscape, additional knowledge can be generated. In the example presented here we also have gained methodological knowledge about communicating in increasingly diverse cultural environments. Language barriers are overcome and technical language in particular made accessible to a variety of people.

Acknowledgements

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References

- Berger, P. L., Luckmann, T. (1966) *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Garden City, NY, Anchor Books.
- Briggs L., Stedman R. & Krasny M. (2014). Photo-elicitation methods in studies of children's sense of place. *Children, Youth and Environments* 24 (3): 154-172.
- Collier J. (1957). *Photography in Anthropology: A Report on Two Experiments*. In *American Anthropologist*, Volume 59, Issue 5, Blackwell Publishing Ltd.
- Gailing, L., Leibenath, M. (2015) *The Social Construction of Landscapes: Two Theoretical Lenses and Their Empirical Applications*. *Landscape Research*, Volume 40, Issue 2, pages 123-138 DOI: 10.1080/01426397.2013.775233.
- Greider, T., Garkovich, L. (1994) *Landscapes: The social construction of nature and the environment*. In: *Rural Sociology*, 59(1), 1-24.
- Hosted, A. (2013). *Social Capital and Disaster Recovery: An Exploration into the Role of Community Gardens*. Honours Dissertation in Environmental Management and Planning, Faculty of Environment, Society and Design. Lincoln University.
- Kahila, M. (2006). *Possibilities of Web-based softGIS Method in Revealing Residents Evaluation Knowledge of the Living Environment* [online]. Helsinki University of Technology, Department of Architecture. Available at: http://opus.tkk.fi/dokumentit/softgis_03022006_bratislava_use.pdf.
- Ruggeri, D. (2013): *The 'My Mission Viejo' Project. Investigating the Potential of Photovoice Methods in Place Identity and Attachment Research*. In: *Journal of Urban Design* 19 (1), S. 119-139. DOI: 10.1080/13574809.2013.854693.
- Tidball K. (2012). *Urgent biophilia: human-nature interactions and biological attractions in disaster resilience*. *Ecology and Society* 17 (2), 5.
- Walsh, J. (2011): *Christchurch: Living in a Crisis Landscape*. In: Robert Schäfer (Hg.): *Crisis landscapes*. Munich: Callwey (Topos, 76), S. 86-89.
- Wesener, A. (2015) "Temporary urbanism and urban sustainability after a natural disaster: transitional community-initiated open spaces in Christchurch, New Zealand." *Journal of Urbanism* 8 (4):406-422. doi: 10.1080/17549175.2015.1061040.
- Wylie, J. (2007) *Landscape (Key Ideas in Geography)*. Routledge, London.

Bridging Landscapes and Cultures Within the International Summer School's Experience

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multidisciplinary studies | landscape architecture | landscape facets | Latvia

The article reflects the use of a multidisciplinary approach in the landscape architecture studies of four international summer schools at the Latvia University of Agriculture from 2012 till 2015. The objective of this research was to investigate the use and benefits of this approach in the education of the representatives of different specialities, also including ones not related to landscape architecture, in understanding and planning of the landscape. Therefore, the main result was a versatile look at the landscape with another person's eyes, the eyes of somebody representing a field different from that of landscape architecture, thus bridging various facets of the landscape – historical, cultural, ecological, aesthetic and social into one common development scenario / concept of the definite area or art work.

The main conclusion of this research was that the use of multidisciplinary approach in landscape architecture summer schools gives additional value in learning process and cognition of various landscape facets through different disciplines and experience of participants and teachers.

Introduction

The Landscape definition in the European Landscape Convention reflects interaction between various human and landscape facets summarizing within the holistic nature of the landscape (Figure 1).

Thus the landscape architecture studies and approaches used in the teaching are strongly affected by the multifaceted nature of landscape (Bell, Herlin, Stiles 2012; Bell 2013). Therefore the multidisciplinary approach is one of the most appropriate teaching methods in this discipline. The approach includes not only an exploration of the different landscape facets – ecological, aesthetic, social, cultural and other (Thompson 2000; Milburn, Brown 2003; Strewlow, Prigann, David 2004), but also an involvement of participants from various disciplines to exchange their knowledge and create more effective solutions.

International summer schools are a great opportunity for the integration of a multidisciplinary approach in teaching. Taking into account professional differences between participants, it is important to realize that the objective of such a summer school is to provide additional knowledge and to deepen the existing knowledge in different landscape related areas. This in turn means that it is also necessary to attract teachers from different disciplines, as well as to use the methods and teaching materials that are clearly understood.

Usually in landscape architecture international summer schools the multidisciplinary approach is combined with project-based learning method, where the definite place becomes a platform for assessment of various landscape facets. Benefits from the combination of these approaches are strengthening the association between theory and practice, better retention in memory, and better retrieval of the pertinent theoretical knowledge facing real problems (Amstrong 1999; Chinowsky et.al. 2006).



FIGURE 1. Various landscape facets within the holistic nature of the landscape. Source: Modified by author (Swanwick 2001)

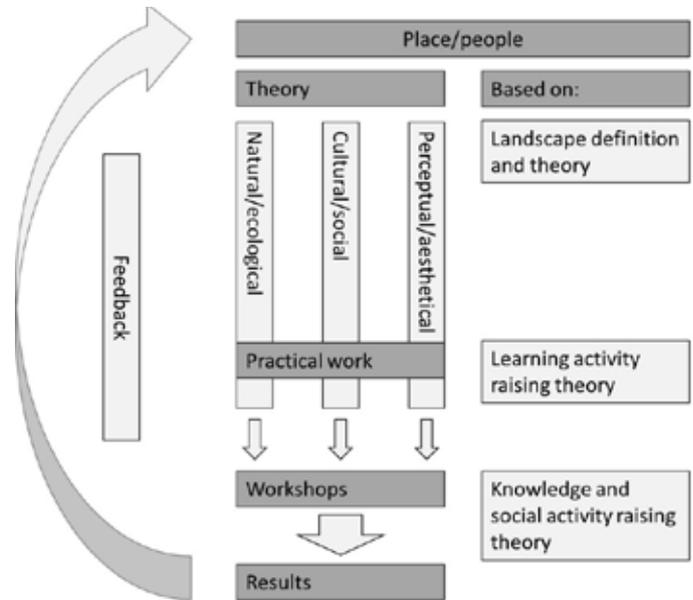


FIGURE 2. Schematic model of the multidisciplinary approach.

The article presents a multidisciplinary approach used in the landscape architecture international summer school from 2012 till 2015 organized by the Landscape architecture and planning study programme and Life Long Learning Centre of the Latvia University of Agriculture. The objective of this research was to detect benefits from the use of the multidisciplinary approach through the final works of students.

Materials and Methods

The multidisciplinary approach for the landscape architecture international summer schools in Latvia was developed according to several baselines:

1. The use of different teaching stages - theoretical, practical and workshop.
2. The exploration of basic landscape facets– natural / ecological, aesthetical / perceptual and cultural / social in all teaching stages, as well as providing teachers of corresponding disciplines.
3. The use of a project-based learning approach in the assessment of basic landscape facets within the definite area.
4. The use of the interview method (Mertens 2011) to providing better communication in working groups.
5. The integration of landscape various facets in the concept of the definite area or art work through the knowledge from different disciplines.

The schematic model of the multidisciplinary approach used in international summer school in Latvia is showed in Figure 2.

Teaching Stages

1. The theoretical stage provided lectures that describe the main theme and the theoretical background of the definite summer school, explaining different landscape facets involved in the theme, as well as the basic principles of the development of the landscape conception or art work. Lectures were from 30 to 45 minutes to provide basic information (Mertens 2011).
2. The practical stage was focused on the acquiring and deepening the theoretical knowledge through practical tasks with the objective to be able to apply these skills in the development of the final work. Students worked in groups of four. The theoretical and practical stages are implemented together within the single day and based on the project based learning approach and interview method. The use of interview method was through the participants mutual communication, exchange of opinions, learning about other group members' work behaviours and ways of thinking (Mertens 2011).
3. Within the workshop stage under the guidance of the mentor the final work was developed based on knowledge and skills gained in the theoretical and practical stages. The type of the final work – a development conception of the definite area or an art work was determined accordingly to the main theme of the specific year's summer school and given tasks of the involved municipalities or other institutions. At the end of the workshop stage the final work was presented with the feedback in the discussion process with the teachers, as well as involved municipalities, local cultural institution, youth centres and art schools was gained.

Table 2. Teaching stages and certain benefits of them

Landscape facets	Theoretical stage		Practical stage		Workshop stage and final work	
	Main topics	benefits	Main tasks	benefits	Part of final work	benefits
Natural/ ecological	Basic principles of the landscape ecology and ecological design Ecological values of the place	Understanding of ecological and natural values of the place, their role in the area planning	Identification/ validation and evaluation of ecological and natural values of the place	Knowledge about the evaluation of ecological and natural values of specific place	Integration of ecological and natural values by using the fundamental principles of the landscape ecology or ecological design	Use of the gained knowledge about ecological and natural values in the vision of development of specific place or art work
Culture/ social	Local traditions; the history of the place ; cultural context; social-economic bases;	Understanding of the history of the place, traditions, people and their way of life	Self-presentation; Work in groups; Interviews of population; Discussions about sociological and economic topics;	Knowledge of the public opinion, needs / requirements and traditions; Acquaintance of colleagues the of the work group through the own point of view;	Presentation of the final work in a group – the reconciliation of the form and the teaching style; Respecting of the local traditions and culture;	Presentation and performance of the original work through the level of the local culture and traditions, including the identity of each participant
Perception /aesthetic	Mental maps theory; Drawing theory; Fundamental principles of the landscape exploration and analysis; principles of the layout design; Environmental objects and their importance in the landscape;	Understanding of the landscape aesthetics and compatibility, the fundamental principles of landscape reading and spatial perception	Drawing of mental maps; Drawing technics – the exploration of the landscape through the drawing; The work-out of the layout;	Understanding of the spatial structure and aesthetic qualities of the object	Creation of the environmental object; development of the planning conception, the vision of the design and landscape planning	Landscape planning and vision; the creation of the environmental object in nature

TABLE 2. Summary of results gained in teaching stages in the context of the different landscape facets.



FIGURE 3. Final work examples from different summer schools.

Conclusions

The main detected benefits from the use of multidisciplinary approach was that students' achieved understanding of cooperation possibilities, and importance between the landscape related disciplines, knowledge to connect gained theoretical knowledge with the practicably feasible landscape issues, as well as skills to use that knowledge in the creation of developing conceptions of the definite area or art work.

Another important part of the summer school was the creation feedback through discussions between participants, teachers and involved institutions. Thus using a multidisciplinary approach in landscape architecture summer schools gives additional value in learning process and cognition of various landscape facets through different disciplines and experiences of participants and teachers, as well as another look at the development possibilities of the definite area.

References

- Amstrong, H., 1999. Design studios as research: an emerging paradigm for landscape architecture. *Landscape Review*, 5(2), 5-25.
- Bell, S., Herlin, I.S., Stiles R., 2012. *Exploring the Boundaries of Landscape Architecture*. Routledge, 344.
- Bell, S., 2013. *Landscape: Pattern, Perception and Process*. Taylor & Francis, 352.
- Chinowsky, P.S., Brown, H., Szajnman, A. and Realph, A., 2006. Developing knowledge landscapes through project-based learning. *Journal of Professional Issues in Engineering Education and Practice*, 132(2), 118-124.
- Dramstad, W.E., Olson, J.D., Forman, R.T.T., 1996. *Landscape Ecology Principles in Landscape Architecture and Land-Use Planning*. Washington: 1996. 80.
- Eplényi, A., Oláh, B., 2011. Landscape sketches: traditional and innovative approach in developing freehand drawing in landscape architecture studies. *Agriculture and Environment Supplement*, 7-18. http://www.acta.sapientia.ro/acta-agrenv/Supl2011/1_Eplenyi.pdf
- Mertens, E. 2011. Activating teaching methods for lectures and seminars. *International ECLAS'11 conference Ethics. Aesthetics*. Sheffield: University of Sheffield, p. 350-360.
- Milburn, L-A. S. and Brown, R.D., 2003. The relationship between research and design in landscape architecture. *Landscape and Urban Planning*, 64, 47-66.
- Strewlow, H., Prigann, H., David, V. (eds.), 2004. *Ecological Aesthetics: Art in Environmental Design: Theory and Practice*. Berlin: Birkhauser, 255.
- Swanwick, C., 2002. *LUC Landscape Character assessment – Guidance for England and Scotland*. Countryside Agency/Scottish National Heritage. <http://publications.naturalengland.org.uk/file/2672917>
- Thompson, I.H., 2000. *Ecology, Community and Delight*. London: E&FN Spon, 216.

Turning Gaps into Bridges: Towards Integral Management of Landscapes

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landscape | heterogeneity | biodiversity | sectoral policies | planning

Landscapes are managed according to sectoral policies, which nowadays often overlap and intertwine and thus narrow the gap between different value systems. In this paper the need for a bottom-up optimized integral approach towards landscape planning and management is emphasized to replace the current top-down normative sectoral approach. The argument is illustrated with the research of the interconnection between landscape heterogeneity, biodiversity and agriculture, which was conducted to fulfil the demands of two sectoral policies: agricultural and nature conservation – both aiming towards a common goal. At the end I argue that sectoral value systems and aims should not work as parallel systems, but should be incorporated into integrative landscape planning.

Introduction

The majority of landscapes are not design-awarded parks, heritage sites or naturally preserved areas. They are ordinary, every-day, and utilitarian. The fact that they have evolved throughout centuries of continuous use, by a majority of European populations, characterizes them to have an important cultural heritage. At the same time, they are the habitat for many species – according to several researchers (Tscharntke et al. 2005, Lomba et al. 2014, Dufлот et al. 2014), 50% of all species live in cultural landscapes - especially in the areas managed with traditional technologies.

Nowadays, the majority of European landscapes are managed according to two powerful mechanisms: Common Agricultural Policy (CAP) and Natura 2000. The sectoral approach towards landscape management in the past has caused explicitly bi-polar development of landscapes: areas of intensive agriculture are interspersed with islands of biodiversity (O'Rourke 2005). In the last decade sectoral policies are narrowing that gap: CAP is focusing less on productivity and more towards achieving environmental targets, while Natura 2000 protects habitats, where constant human interference is needed for their maintenance. Sectoral measures often overlap and intertwine. But the question that arises from these facts is: have we reached the point, where sectoral policies not only overlap and intertwine, but fuse to achieve integral landscape planning and management?

Research Background

I will try to answer the question set in the introduction by presenting the research (Golobič et al. 2015) where the interrelation between landscape heterogeneity and biodiversity and the importance of maintaining the first to preserve the latest were studied. The inducement for the research was derived from two sectoral policies: (1) agricultural and (2) nature conservation.

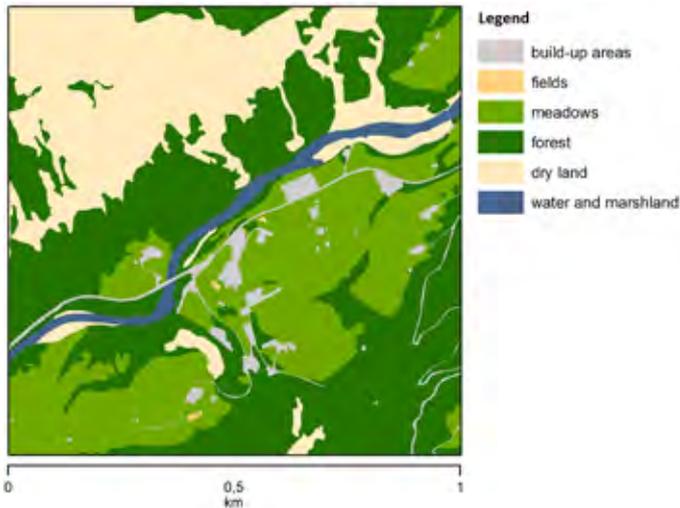


FIGURE 1. Land cover heterogeneity in Trenta.

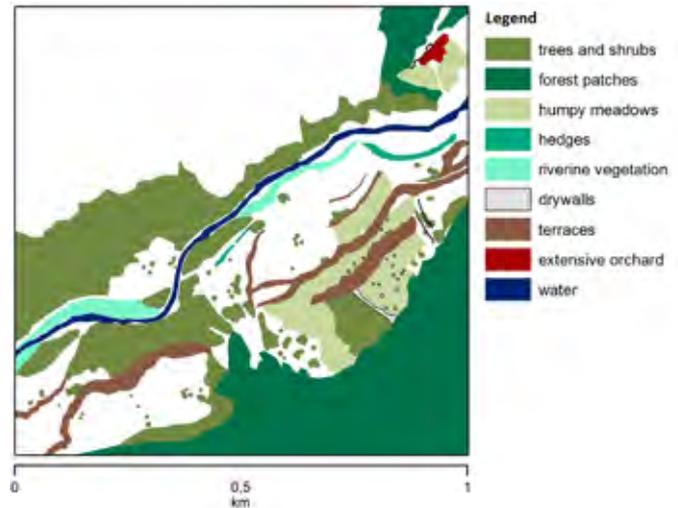


FIGURE 2. Landscape features heterogeneity in Trenta.

1. The 2013 CAP reform has introduced ecological or green components, oriented towards recognizing the importance of extensively cultivated and naturally preserved areas within agricultural landscape for biodiversity conservation. Article 44 of the Regulation EU No 1307/2013 introduces *ecological focus areas* which consist of areas directly affecting biodiversity such as land lying fallow, landscape features, terraces, buffer strips, afforested areas and agroforestry areas, or indirectly affecting biodiversity through a reduced use of inputs on the farm, such as areas covered by catch crops and winter green cover. Member states are obliged to prepare the list of *ecological focus areas*, important for biodiversity conservation, which will be eligible for direct payments within CAP.
2. *Slovenian Nature Conservation Act and Rules on the designation and protection of natural values* determine several types of natural values, which are protected for their outstanding value. Among them, so-called *landscape natural values* are defined as areas with many different landscape elements or areas with characteristic landscape pattern. Up until now, no landscape natural values have been designated.

In order to prepare the list of landscape features as a part of ecological focus areas and set the criteria for determining/selecting landscape natural values, the Ministry of the Environment and Spatial Planning, Ministry of Agriculture, Forestry and Food, and Slovenian Research Agency funded research with following objectives:

- Determination of the relationship between landscape heterogeneity and biodiversity.
- Identification of landscape features, important for biodiversity.
- Development of management guidelines for preserving landscape features.
- Preparation of criteria for designation of landscape natural values.

Methodology

Theoretical research could be summarized in two findings: (1) Heterogeneity and biodiversity of agricultural landscapes are strongly interconnected. (2) The proportion of natural and semi-natural habitats (e.g. hedges, forest patches, etc.) and the extensity of farming (e.g. intensively cultivated cropland vs. traditionally managed grassland) are key factors, which are important for maintaining and/or enhancing biodiversity of these landscapes.

Following these findings and aiming towards achieving our main goal – the development of a methodology for evaluating landscape heterogeneity, we organized our research into several steps:

First, a comprehensive list of landscape features was prepared, including their (a) definition, (b) description, including: soil characteristics, growing conditions and species composition, (c) importance for biodiversity, (d) measures for identification, (e) data sources for mapping, and (f) guidelines for management. Chapter (c) importance for biodiversity was crucial for placing a feature on the final list, while chapter (d) measures which contain the criteria each landscape feature needs to fulfil to be placed on the list. Chapter (f) guidelines for management was prepared as a basis for good management practice for landscape features within CAP ecological focus areas.

Secondly, a theoretical model for evaluating landscape heterogeneity was developed. Two criteria were considered: land cover heterogeneity (LCH) and landscape features heterogeneity (LFH). Landscape heterogeneity (LH) was calculated as a sum of LCH and LFH and evaluated on three-stage scale as: (1) low, (2) medium and (3) high heterogeneity. Later on, the model was tested on three areas, each of the size of one square kilometre. The areas are located in three different regions with different landscape character so that several different regions with different landscape features were identified. Landscape heterogeneity was evaluated as medium for two areas – Parje in Karst region and Barje in Subalpine region, while Trenta in Alpine region was evaluated as high heterogeneity landscape.

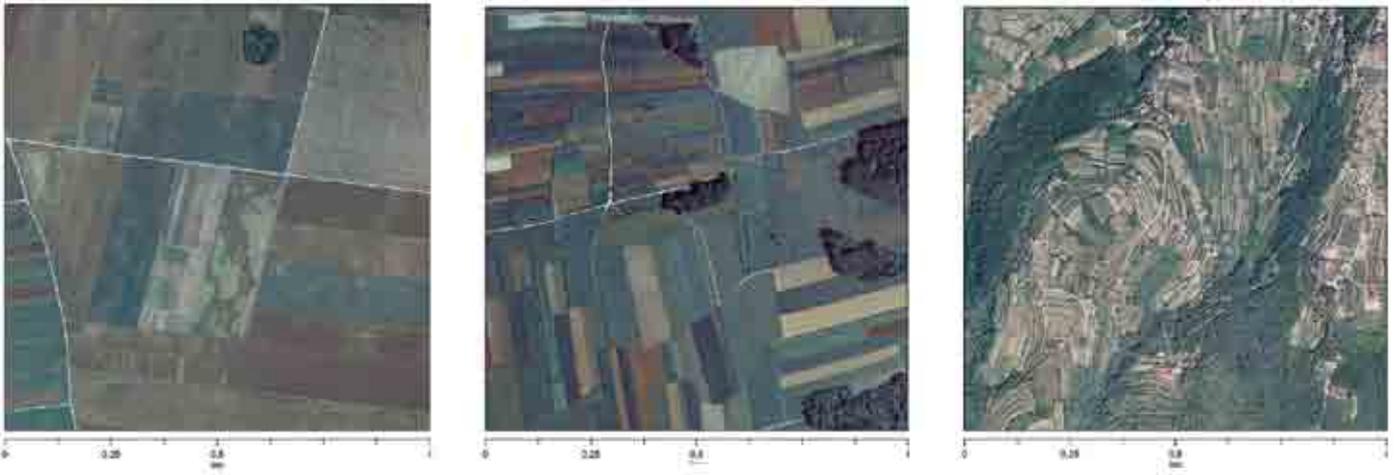


FIGURE 3. Landscapes with low (left), medium (middle) and high (right) heterogeneity.

Results and Discussion

All landscape features, which were placed on the final list are considered important for landscape heterogeneity and biodiversity. However, several questions still remained unanswered:

How many of these features should be preserved in order to preserve landscape heterogeneity and biodiversity, and at the same time enable contemporary farming?

If landscape heterogeneity is one of the key elements of landscape amenity, what is the suitable level of landscape heterogeneity? Can landscape be too heterogeneous and consequently less attractive/coherent? Which landscapes could be designated as landscape natural values?

Although the need for the presented research was derived from demands of sectoral policies, which often solve problems with the help of norms – e.g. the percentage of uncultivated area per parcel of land or conservation of habitats with the conservation of management practices, normative approach towards landscape management proved to have several defects. Different natural conditions, political and cultural relations have shaped European landscapes and this is not the gap we should forcefully close. Like mountain peaks could be reached using alternative routes, common goals regarding landscape – e.g. biodiversity conservation or agricultural production - could be obtained with different measures. These measures should be a part of landscape planning process, which is not normative, but an optimization approach.

Acknowledgements

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References

- Duflot R., Georges R., Ernoult A., Aviron S., Burel F., 2014. Landscape heterogeneity as an ecological filter of species traits. *Acta Oecologica*, 56, 19-26.
- Golobič M., Penko Seidl N., Leštan K. A., Žerdin M., Pačnik L., Libnik N., Vrbanjščak M., Vrščaj B., Kralj T., 2015. *Opredelitev krajinske pestrosti in krajinskih značilnosti, pomembnih za ohranjanje biotske raznovrstnosti / Determination of landscape heterogeneity and landscape features, important for the preservation of biodiversity. Final report*, 247 p.
- Lomba A., Guerra C., Alonso J., Honrado J.P., Jongman R., McCracken D., 2014. Mapping and monitoring High Nature Value farmlands: Challenges in European landscapes. *Journal of Environmental Management*, 143, 140-150.
- O'Rourke E., 2005. Socio-natural interaction and landscape dynamics in the Burren, Ireland. *Landscape and urban planning*, 70, 69-83.
- Regulation EU No 1307/2013 of the European Parliament and the Council of 17 december 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009. *Official Journal of the European Union* 20.12.2013, 608-670.
- Rules on the designation and protection of natural values, *Official Gazette of Republic Slovenia*, No. 111/04, 70/06, 58/09, 93/10 and 23/15.
- Slovenian Nature Conservation Act, *Official Gazette of Republic Slovenia*, No. 96/04.
- Tscharntke, T., Klein, A.M., Krüess, A., Steffan-Dewenter, I., Thies, C. 2005. Landscape perspectives on agricultural intensification and biodiversity - Ecosystem service management. *Ecology Letters*, 8, 857-874.

Factors Influencing Public Perceptions Of Wind Parks: A Laboratory Test Using Video-Acoustic Simulations

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wind energy | public perception | landscape simulation |
information effects | bird hazards

Wind energy and landscape aesthetics have frequently been in conflict. Field studies of wind park perceptions have produced a confusion of findings. Laboratory studies have rarely investigated both scenic and acceptability perceptions across wind park proposals regarding factors that influence changes in acceptability perceptions (Janeckova Molnarova et al. 2012).

Valid video simulations were sought combining visual and acoustic representations of experiences including distant views of, and movement within, wind parks. 90 subjects from the Swiss public experienced such simulations and were split by cluster analysis into skeptics and optimists regarding wind energy development using questionnaire items. They first rated each wind park without information for both visual preference and acceptability. They then made these ratings again after receiving information.

The research question was to compare the influence of four factors upon these different ratings: three levels of bird hazard, two location types, 5 or 10 turbines/park with associated levels of energy production, and attitudes toward wind energy.

Findings about information effects upon perceptions of wind park experiences indicate, that people's attitudes dominate; wildlife impacts mainly affect acceptability perceptions; project locations mainly affect scenic preferences; larger projects adversely affect all perceptions; and more energy production slightly counteracts wildlife concerns.

Introduction

Switzerland seeks to increase renewable energy from many small wind parks. Project proposals encounter opposition in local planning involving public participation and referenda, as described by Luyet et al. (2012). Challenges arise because the Swiss consider maintaining their cultural landscape and its aesthetic qualities important for national identity and tourism.

Findings from investigations of perceptions of wind energy projects come predominantly from field studies (Dai et al. 2015; Karydis 2013) with little systematic control over variables. These have been inconsistent or contradictory. Subjects have judged real or prospective wind farms, at different scales and settings, typically with little experimental control of landscape context, viewing conditions or the sound of turbines. Studies have explored different research questions in diverse geographic, legal and political contexts, studied various respondent samples from different cultures, and employed different analytic methods.

We conducted a simplified laboratory experiment searching for basic insights about how many people tend to form perceptions of wind parks' acceptability that might transfer across contexts. This was the most systematic part of a larger study where data allowed for a controlled test. We explored respondents' attitudes regarding wind energy, aesthetic perceptions, different wind park settings and scales, and the impact of information in affecting perceptions.

Methods

For stimuli we implemented the visual-acoustic simulation approach (Manyoky et al. 2014), linking spatially referenced auralizations of wind turbine noise to a GIS-based virtual 3D landscape visualization model. The experiment employed a 90-second visual-acoustic simulations of wind turbines set into

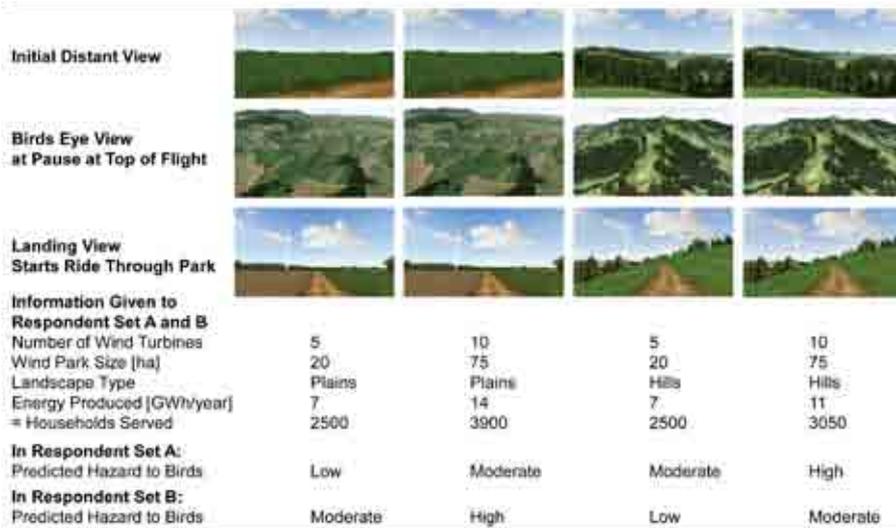


FIGURE 1. Snapshots from wind park simulations in the Swiss plains and hills with their alternative information sets A and B.

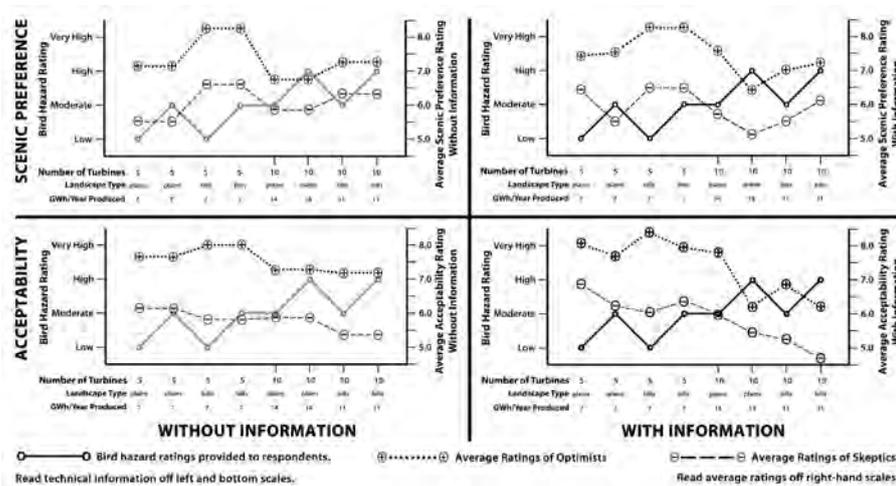


FIGURE 2. Graphs of all mean rating values across the experimental conditions by quality rated and with or without information.

simulated landscapes (Figure 1). All shared the same kind of flight path. Each began with a distant ground-level view for 3 seconds, a 4-second flight up into the air to an apex pause for 2 seconds looking down at the wind park to depict its geographic setting and the number and configuration of turbines. The view then flew down for 6 seconds to a point on a path near the middle of the wind park. A 75 second trip along the ground followed with the sound of the turbines, beginning with a 360° rotation, movement down the path to an end point, and then another 360° rotation. Respondents experienced these simulations in a sound- and light-proof Mobile Visual Acoustic Lab (MVAL) on a big screen to replicate actual landscape experiences as well as possible.

Two simulations were in a generic location in the plains: 5 turbines (Figure 1 far-left) and 10 turbines (Figure 1 centre-left). A similar pair was set in a generic location in the hills (Figure 1 right). Respondents first rated these for scenic preference and for acceptability without information. They were then randomly provided with one of the two different information

sets (A or B) shown for each simulation in Figure 1, whereupon they again rated the wind park for the same qualities. These two information sets differed only in the level of bird hazard. (Wind park area information was not statistically significant in relation to ratings.) The eight experimental conditions are shown within each graph in Figure 2.

90 experimental subjects from Basel and Zurich (planners, energy experts, students and others) answered questions queried concerns and preferences about Swiss landscapes and renewable energy. Twelve of these questions clustered respondents (Ward 1963) to a first solution into wind park skeptics (n=42) and optimists (n=48).

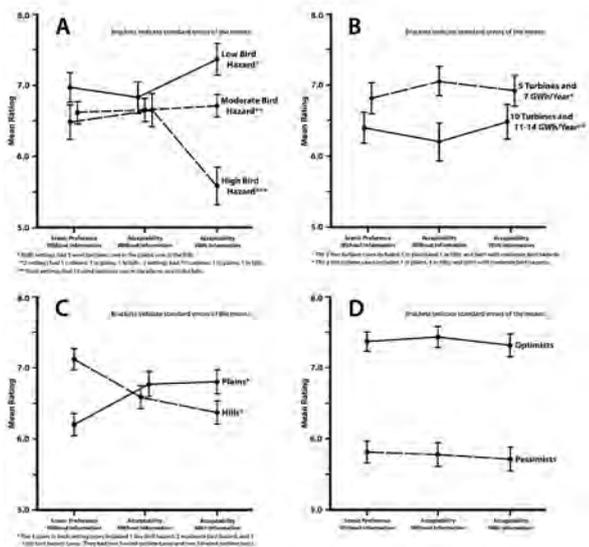


FIGURE 3. Progression of mean ratings associated with wind parks' (A) declared levels of hazards to birds and bats, (B) turbine counts with their energy production, (C) setting types and (D) respondents' attitudes toward wind energy.

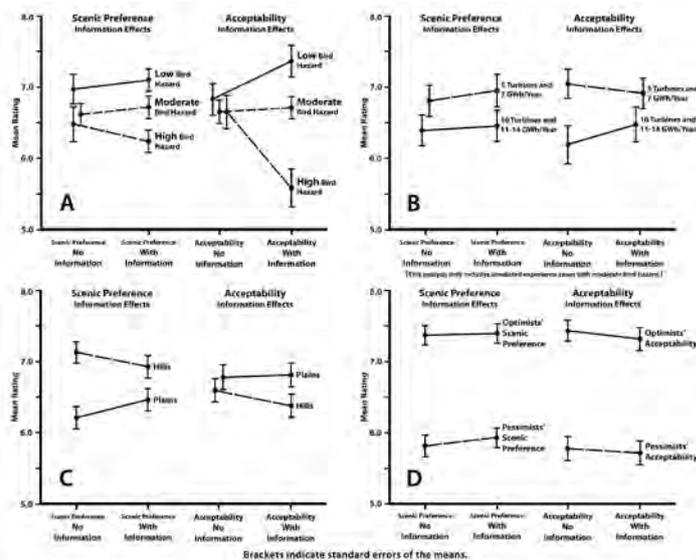


FIGURE 4. Comparing information effects upon scenic preference versus acceptability ratings due to wind parks' (A) declared levels of hazards to birds and bats, (B) turbine counts with their energy production, (C) setting types and (D) respondents' attitudes toward wind energy.

Results

Figure 2 graphs mean ratings across experimental conditions and respondent types. Figure 3 shows how mean ratings 'evolve' from uninformed scenic preferences to uninformed acceptability ratings to informed acceptability. These graphs isolate changes in just one experimental condition with others held constant, or nearly so. Figure 4 compares information effects attributable to each experimental variable upon scenic preference versus acceptability ratings. (Figures 3B and 4B are derived from half the experimental conditions where turbine counts could be compared among cases that shared the same bird hazards.)

Discussion

Adverse information about wind parks' wildlife impacts strongly reduces perceptions of acceptability (Figure 3A). Information about wind park size and energy production effects acceptability in the other direction (Figure 3B). Without information, smaller wind parks have more acceptability, and the difference is greater than comparative scenic preferences. With information about energy production, larger wind parks gain acceptability and smaller ones lose it.

Without information, perceptions of scenic preference are markedly affected by their evident location but perceptions of acceptability are not (Figure 3C). Wind park settings more decisively affect aesthetic perceptions. The choice of locations is critical if aesthetic sensibilities dominate public concerns. More cognitive, less affective concerns dominate acceptability ratings with or without information. With information, setting types that are more acceptable may not be the same as those that are scenically preferred (Figure 3C).

People's attitudes toward wind energy effects differences in perceptions much more than the relationships discussed above (Figure 3D). This suggests that planners can only marginally optimize wind parks' perceived acceptability unless there are

major shifts in public opinions about alternative energy. Information about wind parks' wildlife impacts, affects acceptability perceptions much more than scenic preferences, albeit in the same expected directions (Figure 4A). This kind of information is evidently more deliberative and cognitive than aesthetically affective.

Acceptability perceptions were effected more and differently, than scenic preferences by information about energy production from numbers of wind turbines (Figure 4B). This information increased scenic preferences for smaller wind parks compared to larger ones; but decreased the difference for acceptability. This suggests that information about energy production partly counteracted people's uninformed perceptions that smaller wind parks are more acceptable; but this impact does not occur for more aesthetic perceptions that smaller wind parks are preferable.

Naming the settings of simulated wind park experiences, in association with small differences in energy production, has a big moderating impact upon scenic preferences. It increased them for the plains settings with more energy production and vice versa (Figure 4C). The effect is smaller and reversed for acceptability perceptions, but these are not statistically significant by inspection of the standard errors in Figure 4C. This suggests that people's uninformed scenic preferences can be moderated, at least on the margin, if they become informed about the consequences of wind parks in different settings.

Information effects upon scenic preference and acceptability perceptions are small and statistically insignificant within sets of people sharing similar attitudes toward wind energy (Figure 4D). This suggests that the pros and cons of alternative wind parks cancel within these sets and those that gain broad acceptability do so because of small gains across all people. Information effects matter across all people.

References

- Dai, K., Bergot, A., Liang, C., Xiang, W. N., & Huang, Z. (2015). Environmental issues associated with wind energy—A review. *Renewable Energy*, 75, 911-921.
- Janeckova Molnarova, K., Sklenicka, P., Stiborek, J., Svobodova, K., Salek, M., and Brabec, E., 2012. Visual preferences for wind turbines: location, numbers and respondent characteristics. *Applied Energy*, 92, 269-278.
- Karydis, M., 2013. Public attitudes and environmental impacts of wind farms: a review. *Global Nest Journal*, 15, 585-604.
- Luyet, V., Schlaepfer, R., Parlange, M.B. and Buttler, A., 2012. A framework to implement stakeholder participation in environmental projects. *Journal of Environmental Management*, 111, 213-219.
- Manyoky, M., Wissen Hayek, U., Heutschi, K., Pieren, R., and Grêt-Regamey, A., 2014. Developing a GIS-based visual-acoustic 3D simulation for wind farm assessment. *ISPRS International Journal of Geo-Information*, 3, 29-48.
- Ward Jr, J. H. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 58(301), 236-244.

Landscapes by Extraction: Contemporary Approaches to the Roman City of Tiermes, Spain

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geological landscape | Roman city | rock-cut architecture |
archaeology | Michael Heizer

The landscape of Tiermes is discovered to the eyes of a viewer as a seductive artificial topography, with large sandstone rock walls difficult to understand. Apparently the whole hill seems to be the result of geology and erosive action, but an intelligent regard discovers geometric traces, cuts and excavations, which are the real remains of a Roman city built directly on the rock and that make up a real anthropic landscape. Future challenges of landscape performance call for a contemporary reading of Tiermes, as a place in which scientific archaeology and urban studies coexist on the one hand, but also to keep alive in the viewer the aesthetic seduction that produces the *negative architecture* on the rock. This reflection on the excavated landscape is done in parallel with some works by American artist Michael Heizer as *Double Negative* or *Vertical Displacement*, with excavations that play with the perception of empty space and cycles of matter which develop the idea of landscapes by extraction. (Treib 1987)

Tiermes: The Rocky Landscape

The Roman city of Tiermes is settled powerfully on a red sandstone rock hill at 1200 m. high, characterized by its geologic terraces and huge rock cuts, in the middle of a flood plain surrounded by high mountains, in a truly stunning scenery. Large infrastructure of the ancient city transformed the topography of the rock as cuts or trenches for gates, streets, buildings and particularly a network of aqueducts over 1 km. long, straight lines carved into the surface of the rock, which have befallen the time, and today are presented as cryptic but fascinating elements. Although the landscape in a first approximation apparently seems to be the result of geological and erosive forces, a deep study of geometric footprints indicates human presence and Tiermes became a real anthropic landscape.

The interventions carried out since 2007 by LABPAP UVa Research Group, recover geometry and architectural value of some of the great buildings of the city such as the Roman Forum and the *Domus of Aqueduct* (Arribas 2013), which reinforce the traces of the Roman city and its link with the landscape. Since then, research is oriented towards the south side of the hill of Tiermes, whose topography has historically characterized the place. Its difficult attribution to geology or human construction, leaves the viewer in an inevitable seduction of the unknown and even the sublime. In this context in which both geology and archaeology model the artificial topography of the rock, the contemporary landscape interventions are difficult, and must take up the challenge to preserve the balance between scientific knowledge, and being able to explain the archaeological remains of the ancient city, while they preserve and even enhance the plastic value of the landscape in ruins. (Figure 1)



FIGURE 1. Rocky landscape of the south face of Tiermes, result of anthropic actions (above). Excavated architecture of Tiermes into the surrounding landscape (below left). *Displaced / Replaced Mass*, Desert of Nevada, Michael Heizer, 1969. Reading archeology and landscape by extraction, positive topography and empty space (below right)

Michael Heizer: Archaeology, Landscape and Void

The paradigm shift that involves incorporating this contemporary artistic vision to intervention in archaeological landscapes, implicate a change of reference in the viewer. This paper is oriented in this direction, from the inside of these cavities and excavated stays to the outside surrounding landscape. Tiermes is not going to be understood in a traditional way, but for its excavated complementary landscape. This reflection on the void has been among the main topics of sculpture and architecture over time and acquires an experimental dimension with American land artists in the second half of the 20th century. Among them, the work of Michael Heizer, heavily influenced by the work of his father the famous archaeologist Robert Heizer, who accompanied Michael on his archaeological expeditions in Mexico and Egypt, which then influence his sculptures in negative in the desert landscape of Nevada, like *Displaced/Replaced Mass* (1969). They are perfect geometric excavations in the desert surface as archaeological pits, trying to discover the remains enclosing the interior of the earth, while giving value to the surrounding space. These gaps that disrupt the smooth surface of the desert are a reflection of human action that builds in the same way the living space in the city of Tiermes.

Landscapes by Extraction: Games with Perception

The work *Double Negative* (1969), a double cut 15 m. depth at two ends of a ravine of Mormon Mesa (Nevada, USA), has clear parallels with the aqueduct of Tiermes. Only through our perception and applying the laws of Gestalt, continuity of both parties is established, involving the intermediate empty space, where the absence of the rock creates its vitality (Treib 1987; 15) The work thus acquires a double condition of scale: the point of view of the visitor who enters the large hollow and comprises

the continuity by similarity of two facing cavities, on the one hand. But also the idea which offers a remote aerial view, in which the operation is perceived as a linear cut, as if it had been the product of a surgeon cutting the flat surface of the mesa. Clean cutting in relation to the steep topography further strengthens the scientific nature of what the author would call *Negative Architecture* (Celant 1997; 27).

In the aqueduct of Tiermes we find a similar topographic situation, with an excavated canal that runs along the ridge at a substantially constant height, measured perfectly by the technology of Roman water level and taking full advantage of the resources offered by the construction in a terraced topography: runs along a stretch excavated on the surface and reappears again to be introduced tangentially into the interior of the mountain, where a completely underground section begins. Trying to explain the continuity of the aqueduct for a contemporary viewer, we turn to strategies by using existing remnants known, just introducing a few new elements. The visitor path is conducted through the channel of the aqueduct itself that in certain moments is interrupted becoming a natural window, a real "machine vision" (Alvarez 2015) to experience landscape. In order to complete this perceptive strategy, in the plain surrounding the hill there are some isolated milestones introduced, which are visible from both ends as visual connections. In a similar way to that used by Heizer in *Double Negative*, where the earth from the excavation of two trenches is deposited continuing ground level, stressing the interspace void, it can recover the lost lower level of the aqueduct at both ends, which tense the continuity perception. (Figure 2)



FIGURE 2. Double Negative, Mormon Mesa, Nevada USA, Michael Heizer, 1967-1970 (above) and south trench of Tiermes aqueduct (below). Carved lines that play with the topography and the perception of the viewer.

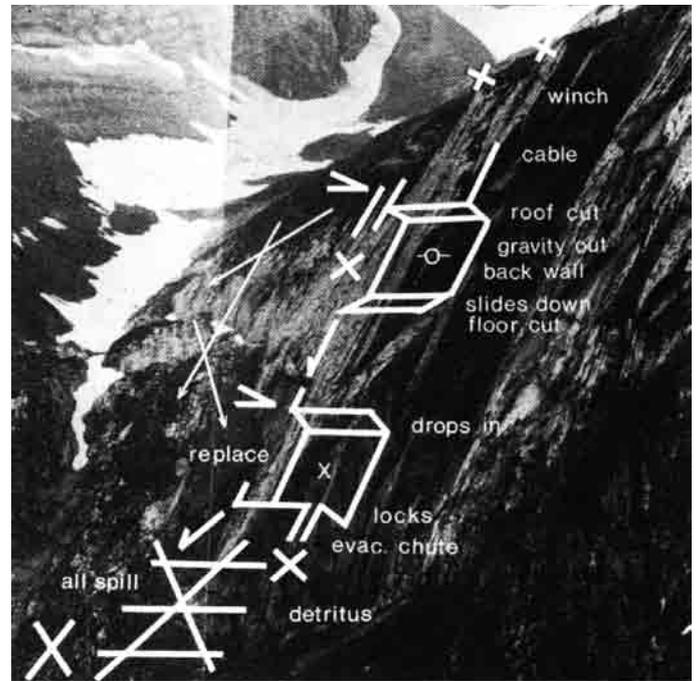


FIGURE 3. Vertical displacement, Michael Heizer: Appenzell, Switzerland, 1970. Working diagrams with rock.

Landscapes of Action: Matter and Time Diagrams

The process of material landscape construction of Tiermes over time comprises a series of actions on the topography of the rock, the hand of man and nature, which in a continuous sequence of extractions, translations and transformations, give as a product new artificial topographies. The landscape is the result of a variation of matter in time, the processes of construction and destruction of the architecture that became archaeology when it was abandoned and whose evidence always remains in the landscape. This reflection is powered by a series of proposals Heizer performed following *Double Negative*, less known and that he grouped under the name of *Vertical Displacement* (1970-1971). The work surface goes from horizontal to vertical, chosen by the artist among a number of sites in the Appenzell mountains in the Alps and the Mount Haggin in Montana, proposing the construction of three vertical sculptures built directly on large natural rock cuts, which reach dimensions of up to 300 m. high, as is the case of the Messmer ravine (Switzerland). (Figure 3)

The methodology proposed by Heizer is based on photographic surveys of vertical geological sections chosen with a suggestive morphology for an artistic creation and on which directly draws diagrams showing the process of working with matter, the forces acting on it and produced movements: "The rock is mechanically cut as a block and is suspended from tensioned cables, slipping several hundred feet down the face of the mountain. Mechanically, the work is directly dependent on gravity as the means to move materials. During this sliding, small pieces of rock would be broken out, which would fall away to the base, accumulate and become structure again" (Brown 1984: 22-23). In this downline concatenate process it seems like Heizer plan the extraction of a fictitious quarry and

transport of stone by gravity, reproducing what would happen in the Egyptian and Mexican buildings he admired, and of course also the construction of the Roman city of Tiermes. At the same time it also reflect an erosion process accelerated by slipping on the rock, similar to that caused by ice in the glacier valley of Appenzell. The power of construction lies in the chosen site itself and through these experiments it is explained the construction technology of man. Both place and man technology, are the two main elements that characterize the landscape of Tiermes, where the unique arrangement of rock platforms and geological cuts put on the service of the Roman buildings, in a balance between adaptation and topographic transformation. In one hand it has taken the advantage of the good views and of the south privileged orientation, and on the other hand, it has valued the economy and technological capacity that always involves digging action.



FIGURE 4. Proposals studies for landscape intervention on the southern front of Tiermes: plant, diagrams excavation-transport-construction-erosion and elevation.

Conclusion: Tiermes, a Landscape in Time

Recent research and landscape proposals in Tiermes are working with this experimental method, a method capable of understanding the current landscape as a process over time. Time that is materialized as a cycle drawn directly on the plan Tiermes identifying the stone quarry, transportation line and architectural construction in a first Roman occupation, but also the process of abandonment, archaeology and aggressive erosion afflicting the archaeological site, which produces equally the beauty and the fragility of conservation. These new proposals track and suggest these flows of matter, which are their own roads and urban infrastructure of the Roman city. Thus, these lines are integrated into the path system, leading the viewer to specific locations where perceptive resources are enhanced and studied, such as city gates or privileged places with archaeological remains of streets and buildings silhouetted against the landscape. In short, these lines of extraction are those that now plan Tiermes landscape together with the landscape that is around, lines that guide the eye and suggest a future that gives continuity to Tiermes as a landscape over time. (Figure 4)

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References

- Álvarez, D., 2015. Proyectar lo Intangible. Heterotopías del tiempo en tres Paisajes Patrimoniales. In: L. Franciosini and C. Casadei, eds. *Architettura e Patrimonio: Progettare in un paese antico*. Roma: 2015, 32-43.
- Arribas P., Fernández S., Rodríguez C., Zelli F., 2013. Tiermes Cultural Lab: Excavation, Conservation and Musealization of the Archaeological Site of Tiermes (Soria, Spain). *Procedia Chemistry* 8, 328-36.
- Brown, J., ed., 1984. *Michael Heizer: Sculpture in Reverse*. Los Ángeles: The Museum of Contemporary Art.
- Celant G., 1991. *Michael Heizer*. Milán: Fondazione Prada.
- Treib M., 1987. *The Presence of Absence: Places by Extraction*. *Places* 4, 8-19.

Understanding Uncertainty in Cultural Landscape. A Hermeneutical Approach to Catastrophe

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cultural landscape | catastrophe | hermeneutics | uncertainty | tsunami

Catastrophes are usually perceived as exceptional and unpredictable events that very rarely take place and cause a range of damage often extreme to the spatial system. Traditional technical and scientific approaches to the geography of disasters has often taken into consideration hazard just by considering scenarios pre and post-event from a narrow statistical and probabilistic vision of vulnerability and mitigation of risks and a widespread idea of reconstruction of the previous conditions if possible, instead of considering hazard as a close result of the strong linkage between nature and society that conforms cultural landscape, this is, just inherent to the cultural landscape system.

The only difference between a catastrophe and any other event to take place in a territory is the level of uncertainty. But catastrophes happen and have happened throughout history, conforming a culture of settlement, tasks and human adaptation to nature and of nature itself. This adaptation is necessary and has to contemplate uncertainty as a key factor. And its complexity should be understood as a relational system that also represents the relationship between social-spatiality and uncertainty, as territories increase their level of complexity to face uncertainty, the complexity gives the system's the ability to reach a wide range of possible, unpredictable futures.

Under the definition of cultural landscape, as the set of cultural properties that represent the combined evolving works of nature and of man, it is undoubtedly for us that besides the representation of the phenomenologic set of relations that have defined and shaped the present landscape system lies the set of actions in progress the society produce to face catastrophes. In fact, cultural landscape includes in its deep structure both lineal current processes and non-linear probable catastrophes. Amos Rapoport, among others demonstrated the complexity of the housing structure as a cultural phenomenon, and its close link to the idea of time, pointing out the idea that sociocultural aspects shaping housing forms change (both facts and answers) gradually, and thus this absence of rapid changes imply a high resistance in forms characteristic to vernacular houses and landscape morphologies.

We can only partially agree with Rapoport. What if changes (both factors and responses) do not only appear in a gradual form, but in cases of landscapes of uncertainty these changes often take place because and of consequence of, non-linear, sudden, not purely and strictly predictable phenomena. Large and sudden changes that have taken place in spaces several



FIGURE 1. Palafittes in Castro, Chiloé Island, X region, Chile. Courtesy of Mario Torres Jofré, Architect.

times in history become an inherent factor of the whole socio-cultural range. Like cultural landscape is modified by both physical and cultural conditions, its form is also determined by sociocultural relationship to disasters if the social system has incorporated it to the collective, in terms of Halbwachs, memory.

Hermeneutics, once the method of interpretation of sacred texts, after W. Benjamin's *Passagenwerk* the exploration of hidden and complex dimensions after the relations between first apprehensible elements, and hermeneutic techniques applied to cultural landscape permit to get an approach of the timeless links between landscape/territory and hazard. We have explored several cases in which landscapes can only be approached through some kind of archaeology of past events and also archaeology of the possible futures to come. Among these cases, two of them, coastal Chile and Japan, are strongly significant. Both landscapes are linked to territories of high uncertainty. Earthquakes and former tsunamis are not unusual, even common, so collective memories have internalized their recurrence and often returning. Nevertheless, their internal specific cultures are extremely different from each other, so conclusions become of great interest.

i. Coastal Chile

Since 1900 Chile has suffered more than fifteen earthquakes with a magnitude over 8.0 Mw, from Tierra del Fuego in the Southern extreme of the country to the Region of Atacama in the North. Most of them have been accompanied by destructive tsunamis, the earthquake of Valdivia, in 1960, being the strongest one in recorded history. The regions of Concepción and Valdivia keep the oldest disasters registered in 1570 and 1575. 7th and 8th regions in Chile, Maule and BioBio, where Concepción is, were the worst affected by the 8.8 earthquake and tsunami in 2010. For centuries, the coasts of Chile have suffered a larger number of these disasters than any other region in the world. The first consequence is that the idea of cultural heritage is slightly different than in any other country. Few cultural elements alongside the coast are older than a few decades, those with more than one or two centuries have been

repaired or rebuilt from time to time. Concerning cultural landscape, the idea of the ephemeral is present everywhere. Settlements whatever their function, houses, factories or warehouses, villages and small towns, help shape the landscape so that its ability to evolve takes into account the idea of an uncertain future. This idea of uncertainty shows itself in at least three scales in traditional coastal Chilean landscapes:

- **Location.** In Chile almost every coastal place can be considered highly vulnerable the location as a factor has more to do with the idea of reducing the impact of catastrophes by either increasing self-sufficiency or multiplying physical linkages between different places if necessarily more specialized, in both cases developing an increase in complexity.
- **Morphology.** Catastrophes happen. Territorial systems are systems of both individual interests and mutual aid at the same time. Therefore land property is strictly defined because of certain reasons, among them, the necessity of redefine landlines in the aftermath of a disaster and determine precise individual responsibilities in pre and post-catastrophe scenarios, the size of the lots according to land prizes and number of subdivisions due to heritage. For safety reasons, and also to increase complexity itself, coastal settlements consists mainly of more or less regular grids with a relatively large number of streets, with small-sized blocks.
- **Building Typology.** Land is the key, but buildings traditionally have not mattered traditionally the same way. The idea of the ephemeral is the main characteristic of traditional building in a landscape of uncertainty. After an extreme catastrophe only the map of land property is needed to survive, and it will. Buildings will fall; they are designed so that either because of a catastrophe or natural or social evolution the loss of their falling should be reduced at minimum. Obvious preference for self-construction has to do not only with the cost of the building itself but also for the knowledge of the structural behaviour.



FIGURE 2. Dichato, VIII region, Chile. 2010, a few days after tsunami. Courtesy of Mario Torres Jofré, Architect.

Buildings are low cost not only if owned by lower social class, but because it is the land that is of worth, not the building, whatever its use. Wooden churches in Chiloé Island, now World Heritage, were paradoxically built not to last forever, nor even centuries at all. Most houses are conceived and built so in case of catastrophe cause the least possible damage and economic loss. Detached family one-floor houses constitute the main type. Building structures are simple, and materials are the common ones in each region, wood if possible, sun-dried adobe if not. Just by the sea, palafittes, houses on piles, are the main type to face tides, floods and little tsunamis, and sometimes eventually landslides.

Traditional coastal Chilean landscapes can only be understood by considering its close relationship with the idea of uncertainty. On September 16th 2015, a nearly 5 meter high tsunami devastated Caleta Tongoy, South of the city of Coquimbo. There were very few victims, but the local papers spoke of high impact and devastation. By analysing images it is easy to confirm that most of the buildings close to the beach were torn down or damaged. Caleta Tongoy is well famous for its typical “picadas” (traditional seafood low-priced restaurants) by the fishing port. Most of them were effectively destroyed, but it has to be considered the extreme simplicity of their built structure, so that reconstruction has been quite easy after cleaning rubble.

ii. Pacific Coast of Japan

The 2011 9.0 Mw earthquake of the Pacific coast of Tōhoku is famous for the devastation of the consequent tsunami and the catastrophe of the nuclear plant of Fukushima. The tsunami reached somewhere a height of more than ten or twelve meters (with extreme peaks even higher and of extreme devastating energy), and in the region of Sendai the water entered almost 10 km inland in some places. A complete unpredictable combination of factors, how a first wave acted like a wall for a second one, whose energy became multiplied, gave place to one of the most recent devastating catastrophes in the world. Nevertheless, it is very important to point that Japanese traditional landscape has been shaped in time to face catastrophes, although not of course of that precise magnitude and including a nuclear disaster.

Much more mature than Chilean, Japanese landscape is the perfect image of complexity. This complexity, a mix of diversity, subtle networks of links between elements and functions, a mix of large and small structures and pieces, with a preference for smaller ones, is both a product of time evolution and an idea of open ability to evolve to face uncertainty. Earthquakes and tsunamis are part of the common imagery and collective memory. For centuries, even millennia, Japanese coastal territory has been shaped into one of the most artificially designed landscapes in the world. Much of the topography has been shaped in the form of a park system so that it is quite easy to reach an artificial well-planted hill in case of tsunami.

But if in Chile the idea of ephemeral has been traditionally important, in Japan this is an extreme concept. Except for monuments, buildings are conceived to last no more than a few decades, even if something catastrophic happens or not. Some regions or prefectures have even pointed by law that buildings in any case have to be rebuilt after some decades depending on the structural types, very often no more than thirty or forty years. So, unlike the rest of the world, in Japan buildings depreciate each year. The taxable value of a building is controlled by its building material, and decreases with age, wooden houses being considered to have an average lifespan of



FIGURE 3. Housing in Sendai, Prefecture of Miyagi, Japan. Photo, Javier Ruiz Sánchez, 2011.



FIGURE 4. Ishinomaki, Prefecture of Miyagi, Japan, one of the most devastated places after 2011 tsunami. Photo, Javier Ruiz Sánchez, 2011.

twenty years, and concrete ones of no more than thirty years.

Buildings are completely detached in a system of very small-sized property lots. This extremely small size is both because of the maturity of the territory and the high prices of land. So the typical Japanese house consist of a two-story wooden house in a narrow lot detached from the adjacent with at least some centimetres apart to prevent transfer of damages in case of a catastrophe (earthquake, tsunami or fire).

So different cultures have shaped very different landscapes. But Coastal Chile and Japanese landscapes share a lot of hidden characteristics due to their not so different relationship with the idea of uncertainty. A first main conclusion is the possibility of using a hermeneutical approach to reach these hidden dimensions in landscape processes far from the first perception. A second conclusion is the understanding of landscape as learning processes, and in case of high uncertainty the possibility of applying lessons learned to re-orientate processes after a catastrophic event, not a mere reconstruction of the past, but a reinvention of the complexity in process.

Annotation

We take catastrophes in a wide sense, following French Mathematician René Thom's catastrophe theory, considering under the notion of catastrophe non-linear extreme bifurcations within a dynamic system. So this notion includes not only natural disasters but crisis or social conflicts and the combination of this always related aspects.

References

- Bankoff, G., Frerks, G. and Hilhorst, D. (eds.), 2006. Mapping Vulnerability; Disasters, Development and People. London & Sterling, VA: Earthscan.
- Bertin, M., 2014. Città al limite. Per una trattazione urbanistica del disastro. Cuadernos de investigación urbanística Ci[ur], 94, 1-73.
- Cutter, S.L. (ed.), 2001. American Hazardscapes: The Regionalization of Hazards and Disasters. Washington D.C.: Joseph Henry Press.
- Halbwachs, M., 1950. La mémoire collective. Paris: Presses Universitaires de France, rééd. Albin Michel, 1997.
- Rapoport, A., 1969. House Form and Culture. Milwaukee: University of Wisconsin.
- Ruiz Sánchez, J., 2016. Lo tangible y lo intangible en la conformación del Paisaje Cultural. Una aproximación hermenéutica y comunicativa. Ábaco, 86.
- Schlögel, K., 2003. Im Raume lesen wir die Zeit; Über Zivilisationsgeschichte und Geopolitik. Vienna & München: Carl Hanser Verlag.

Implications of the EU Revisions of the Environmental Impact Assessment (EIA) for Landscape Planning

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landscape and visual impact assessment | cumulative impacts |
environmental impact assessment | scenario planning

Aim of the paper is to identify the major implications of the EIA-Directive for landscape planning in Europe. Based on a literature review and a document analysis, key changes are identified. It is concluded that in some areas of the revisions, e.g. cumulative impacts, landscape planning could act as a best practice model for other environmental topics within the EIA. In other areas such as public participation, the amended EIA process may open up new opportunities for landscape architects and planners.

Environmental Impact Assessment (EIA) is the formal process of weighting and assessing the possible environmental impacts of proposed infrastructure projects. EIA is also relevant in landscape planning because most projects require an assessment of landscape and visual impacts, which in some countries is conducted by landscape planners (Landscape Institute and IEMA 2013). The current EU EIA-Directive and its annexes define the types of projects requiring an EIA, and key elements of an EIA such as screening, scope of the assessment, stakeholder participation, mitigation/compensation and publication of the EIA report. In March 2014, the European Parliament approved a range of amendments to the EIA Directive 2011/92/EU in Directive 2014/92/EU. In this reflective paper, the implications of the EIA revisions for landscape planning are analysed.

Morgan (2012: 9) looks at EIA processes across the world focusing on the last 10-15 years and identifies several areas that are “still comparatively under-developed”: the assessment of cumulative impacts, public participation and often the effectiveness of EIA. Another weakness is the often-occurring gap between best practice in the literature and poor EIA applications on the ground. Jiricka and Proebstl (2009) compared the strategic and methodological influence of the EIA-Directive on environmental planning across Europe and emphasize that the effectiveness of the EIA process strongly depends on the implementation into national law. They see potential for further optimizing the EIA process if methodology and data collection procedures were more comparable across Europe.

Document Analysis of Directives 2011/EU/92 and 2014/EU/52

The following results are based on a document analysis of the latest approved version in comparison to previous draft versions of the amendment and the original EIA Directive 2011/EU/92. Guiding question for the analysis is how the amendment could potentially impact the landscape architecture/planning profession.

Screening Process: From the perspective of landscape architecture, positive changes start with the pre-text to the amendments, which now refer to the European Landscape Convention in paragraph 16. The screening process receives more attention now and is almost becoming a “mini EIA” (Smith 2015). Landscape is now mentioned as assessment criterion in the screening process.

Public information and Participation:

(18) With a view to strengthening public access to information and transparency, timely environmental information with regard to the implementation of this Directive should also be accessible in electronic format. Member States should therefore establish at least a central portal or points of access, at the appropriate administrative level, that allow the public to access that information easily and effectively.

While some member countries such as the UK already have online depositories for EIA reports, most countries still need to put the necessary infrastructure into place. This could become an interesting task at the interface of landscape architecture and participation how to communicate the assessment of visual and landscape impacts to the public.

Assessment of significant factors in the EIA: Another key change Directive 2014/52/EU introduces the adoption of new factors to the assessment process (new topics are highlighted in the right column):

Directive 2011/92/EU Status quo:	Directive 2014/52/EU amendments:
Article 3 (a) human beings, fauna and flora;	Article 3 (a) population and human health;
(b) soil, water, air, climate and the landscape;	(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
(c) material assets and the cultural heritage;	(c) land, soil, water, air and climate;
(d) the interaction	(d) material assets, cultural heritage and the landscape;
	(e) the interaction between the factors referred to in points (a) to (d).

The increased attention to biodiversity, climate and land in the sense of land take might lend itself to an input from landscape studies (Landscape Institute 2013). Landscape itself has not changed as a topic although it is now listed under the same point as “material assets and cultural heritage” instead of natural resources such as “soil, water, air and climate”. It needs to be seen whether this subtle change will shift the emphasis to cultural and historic dimensions of landscapes away from the natural/physical dimensions.

Mitigation

Directive 2011/92/EU Status Quo:

No equivalent

Directive 2011/92/EU is Amended as Follows:

(5) in Article 5, paragraphs 1 to 3 are replaced by the following:

(c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

(d) a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics [...]

Although the definition of “significant adverse effects” is kept very vague in the amendments, the increased emphasis on mitigation could be an opportunity for landscape architects to contribute more natural mitigation measures through landform or vegetation.

Cumulative impacts: Annex III has been specified with regard to the assessment of potential impacts. An important amendment is the stronger consideration of cumulative impacts, i.e. the combined impact of existing and other proposed impacts.

If compared to previous drafts of the EIA amendment, the omissions in the final version are very interesting: Ecosystem services (ESS) have been dropped in the final version despite an increasing interest among decision-makers. Another controversial point was the accreditation of competent experts and since landscape architecture is a rather small discipline, there were concerns that landscape architects would have been excluded from the EIA process if this had gone through. On the other hand, the innovative consideration of alternatives is not compulsory nor is the EIA process compulsory for every “fracking” project (Figure 1).



FIGURE 1. Doe Green test site for hydraulic fracturing ("fracking) near Warrington (UK).

Discussion

What does the amendment mean for landscape architects? Although cumulative impacts are still often poorly understood, the landscape profession has probably a leading role in cumulative impact assessment (Landscape Institute and IEMA 2013). It is well possible that other disciplines could learn from landscape regarding the now required assessment of cumulative impacts. However, the implementation of the EU EIA Directive and its amendment in the UK is now up in the air due to the recent referendum about its EU membership.

The stronger consideration of newly added topics land take and biodiversity, will most likely benefit ecologists and biologists but might also be in favour of landscape architects. The increased emphasis on participation is generally appreciated. As Smart et al. (2014) point out, especially the EIA processes for onshore wind farms often fail to consider their social acceptability sufficiently. With this respect, the proposed amendments for improved participation may open new opportunities for the assessment of onshore wind farms. That said, the simultaneous speeding-up of the assessment process (see Morgan 2012) might outweigh any positive stimuli for participation.

In conclusion, there is considerable potential in the 2014/52/EU revision for an increased contribution of landscape architects and planners to the EIA process. The actual extent though will depend on the individual national implementation through the individual membership state. Hopefully, landscape architects and their professional bodies will be able to contribute to these national implementations.

References

- European Commission (2011). Environmental Impact Assessment (EIA) Directives 85/337/EEC, 97/11/EC, 2003/35/EC, 2009/31/EC codified in 2011/92/EU.
- European Commission (2014). Directive 2014/52/EU.
- Jiricka, A., & Pröbstl, U. (2009). One common way – The strategic and methodological influence on environmental planning across Europe. *Environmental Impact Assessment Review*, 29(6), 379–389. doi:10.1016/j.eiar.2009.02.001
- Landscape Institute (2013). Proposed amendments to Directive 2011/92/EU (EIA Directive). London, Landscape Institute. Available from: <http://www.landscapeinstitute.org/PDF/Contribute/ProposedEIADirectiveamendments.pdf> [Accessed 26 April 2016].
- Landscape Institute and the Institute of Environmental Management & Assessment (IEMA). (2013). *Guidelines for Landscape and Visual Impact Assessment* (3rd Edition). London: Landscape Institute.
- Morgan, R. K. (2012). Environmental impact assessment: the state of the art. *Impact Assessment and Project Appraisal*, 30(1), 5–14. <http://doi.org/10.1080/14615517.2012.661557>
- Smart, D. E., Stojanovic, T. A., & Warren, C. R. (2014). Is EIA part of the wind power planning problem? *Environmental Impact Assessment Review*, 49, 13–23. <http://doi.org/10.1016/j.eiar.2014.05.004>
- Smith, Alison (Pegasus Group) 2015: Directive 2014/52/EU A brief overview. Lincoln, The Institute of Environmental Management and Assessment IEMA (2016). Available from: <http://www.iema.net/event-reports/2016/04/19/directive-2014/52/eu-a-brief-overview/> [Accessed 24 April 2016].

An Assessment of the Relative Contribution of Private Residential Gardens to the City-Wide Green Space Benefits and Services: The Case of Tartu, Estonia.

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green space | residential garden | ecosystem services |
urban trees | neighbourhood

There is increasing evidence that urban green space is beneficial to both the urban ecosystem and human health and wellbeing (Bolund and Hunhammar 1999; de Groot et al. 2002; Valarde et al. 2007; Park et al. 2010). However, most cities inventory and manage public green spaces and ignore private areas. These, such as residential gardens, despite their abundance in many urban areas, are under-researched. Residential gardens are under threat from urban densification and changing socio-cultural, socio-economic and lifestyle conditions (Freeman et al. 2012; Bhatti and Church 2001). They may constitute a major component of urban green space, increasing urban biodiversity and ecological functioning (Loram et al. 2007; Gaston et al. 2005), which largely depends on their extent, structure and composition (Smith et al. 2005; Loram et al. 2008) as well as the way they link into the wider public green infrastructure. Their morphologies are determined by housing type, neighbourhood pattern and positioning within the urban gradient. Despite constituting a large urban nature reserve, often with significant bird populations for example (Fuller et al. 2008; Cannon et al. 2005) residential gardens are undervalued, but function as a critical space in the urban ecological landscape (Freeman et al. 2012).

Introduction

There is increasing evidence that urban green space is beneficial to both the urban ecosystem and human health and wellbeing (Bolund and Hunhammar 1999; de Groot et al. 2002; Valarde et al. 2007; Park et al. 2010). However, most cities inventory and manage public green spaces and ignore private areas. These, such as residential gardens, despite their abundance in many urban areas, are under-researched. Residential gardens are under threat from urban densification and changing socio-cultural, socio-economic and lifestyle conditions (Freeman et al. 2012; Bhatti and Church 2001). They may constitute a major component of urban green space, increasing urban biodiversity and ecological functioning (Loram et al. 2007; Gaston et al. 2005), which largely depends on their extent, structure and composition (Smith et al. 2005; Loram et al. 2008) as well as the way they link into the wider public green infrastructure. Their morphologies are determined by housing type, neighbourhood pattern and positioning within the urban gradient. Despite constituting a large urban nature reserve, often with significant bird populations, for example (Fuller et al. 2008; Cannon et al. 2005) residential gardens are undervalued, but function as a critical space in the urban ecological landscape (Freeman et al. 2012).

The main goal of this research was to assess the relative contribution of residential gardens to the city-wide green space ecosystem services and benefits in Tartu, Estonia. In order to achieve this, we aimed to identify the extent to which green space elements, especially trees, found in private gardens contribute to urban green space benefits.

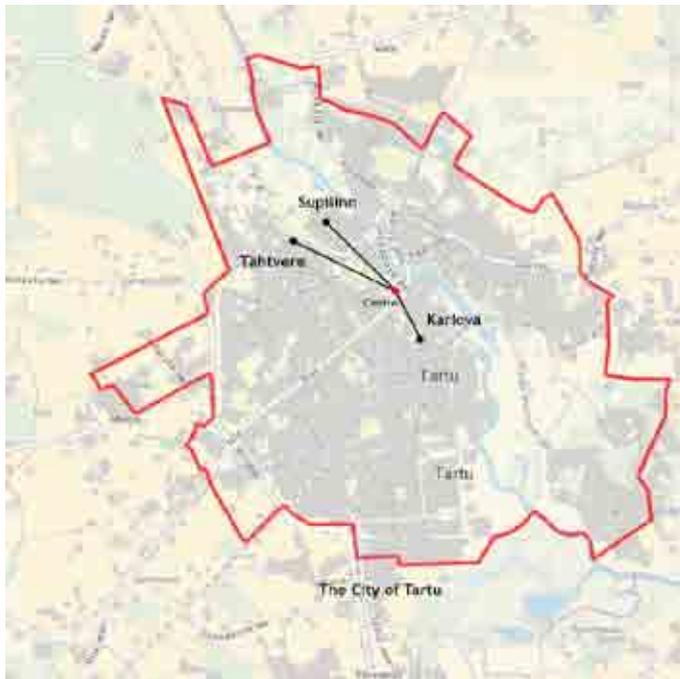


FIGURE 1. Location of all three neighbourhoods within Tartu administrative boundary. (Source: Maa-Amet Maps, 2016)



FIGURE 2. Street and garden character of selected neighbourhoods. (Source: the authors)

Methods

Study Site

The study was conducted in the city of Tartu, Estonia. The administrative boundaries of the city enclose an area of more than 38.80 Km², with a population of around 100,000. A stratified sample of segments of three typical residential neighbourhoods, Karlova (46 parcels), Tahtvere (31 parcels), and Supilinn (36 Parcels) was surveyed (see Figure 1). In total 15 streets were surveyed from the three different neighbourhoods and data on their garden extent, land cover and tree characteristics were collected and analysed. Figure 2 shows some of the characteristics of the areas.

Recording Garden Characteristics

Parcel size, total garden area, rear and front garden area of the houses were calculated. Tree attributes including tree density; tree types (conifer, deciduous, fruit and non-fruit); canopy cover; diameter at breast height; tree height; tree maturity and tree species richness were recorded. The information was mapped and a series of statistical analyses of the relationship of the variables was carried out. Figures 3 shows the distribution of the green elements within each sampled segment.

Results and discussion

It was found that there was a significant contribution to urban green made by the large number of trees in the sampled private gardens compared with street trees and other public space elements in the same neighbourhoods. Garden size was had a role in determining garden composition, proportion of green land cover and tree attributes at plot and neighbourhood level: plots with a larger average size, eg in Tahtvere, had more

trees on average per plot than in the denser areas of Karlova or Supilinn. Tree density, canopy cover and species richness showed a linear positive relationship with garden size. Conifers were not as common as deciduous trees, but there tended to be more of them on the larger plots. Fruit trees were ubiquitous, but not all gardens possessed them, non-fruit trees being generally more common.

Garden size was found to affect other garden resources such as canopy cover, species richness, tree maturity and presence of other green elements. Large gardens appear to form the main reserve of mature trees (60%) within the sampled neighbourhoods. The garden trees when combined together form connected territories for different terrestrial vertebrate, invertebrate and avian species, allowing them to move freely, to take refuge and to reproduce. 46.9% of all gardens were also found to have a large proportion of uncultivated or neglected land that can also play a role in ecosystem functioning such as storm water infiltration. At this local scale, comparing them with incidental public green spaces, they were found to be more species-rich, to possess more layers of vegetation and expected to hold a richer biodiversity than urban public green spaces.



FIGURE 3. Sample study areas – maps showing the spatial distribution, green area and tree canopy (drawings not to scale); a) Karlova; b) Tähtvere C) Supilinn (Source: the authors)

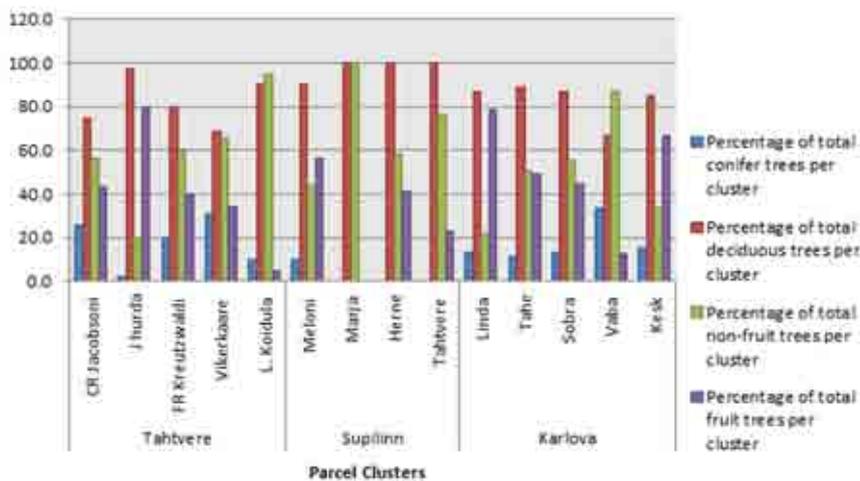


FIGURE 4. Percentage distribution of types of trees (conifer, deciduous, non-fruit, and fruit) for all sample clusters, by street.

Conclusions

The study aimed to see how much private gardens contribute to overall urban green space by surveying the amount, type and quality of green elements, especially trees, in a sample of private gardens in typical residential areas in Tartu. While Tartu is considered to be quite a green city with many public parks, nevertheless, private gardens play host to a large number of trees. In the sampled private gardens it was found that up to 60% of the total tree population was old. These trees do not appear on any official inventory and do not come under the jurisdiction of the city except where people want to remove them. While Tartu is not an especially densifying city, there are trends to build additional houses in larger gardens and the losses of trees through neglect cannot be ignored, especially when the mature trees tend to be found in gardens. Much greater concern and awareness of the role of private green elements is needed by city authorities and they should be included in inventories.

References

- Bolund, P. and Hunhammar, S., (1999) Ecosystem services in urban areas, *Ecological Economics*, 29, 293–301.
- Bhatti, M., Church, A., (2001) Cultivating nature: Homes and Gardens in Late Modernity, *Sociology*, 35 (2), 365-383.
- Cannon, A. R., Chamberlain, D.E., Toms, M.P., Hatchwell, b.J., and Gaston, K.J., (2005) Trends in the use of private gardens by wild birds in Great Britain 1995–2002, *Journal of Applied Ecology*, 42, 659-671.
- de Groot, R.S., Wilson, M.A., Boumans, R.M.J., (2002) A typology for the classification, description and valuation of ecosystem functions, goods and services, *Ecological Economics* 41, 393–408.
- Freeman, C., Dickinson, K.J., M., (2012) “My garden is an expression for me”: Exploring householders’ relationships with their gardens, *Journal of Environmental psychology*, 32, 135-143.
- Fuller, R.A., Warren, P.H., Armsworth, P. R., Barbosa, O., Gaston, K.J., (2008) Garden bird feeding predicts the structure of urban avian assemblages, *Diversity and Distributions*, 14(1), 131-137.
- Gaston K.J., Warren P.H., Thompson K., Smith, R.M., (2005) Urban domestic gardens (IV): the extent of the resource and its associated features. *Biodiversity and Conservation*, 14(14), 3327–3349.
- Loram, A., Tratalos, J., Warren, P. H., Gaston, K.J., (2007) Urban domestic gardens (X): the extent and structure of the resource in five major cities. *Landscape Ecology*, 22(4), 601–615.
- Loram, A., Warren., P.H., Gaston, K.J., (2008) Urban Domestic Gardens (XIV): The Characteristics of Gardens in Five Cities, *Environmental Management*, 42, 361-376.
- Park, J.J., O’Brien, L., Roe, J., Thompson, C., W., Mitchell, R., (2010) The natural outdoors and health: Assessing the value and potential contribution of secondary public datasets in the UK to current and future knowledge, *Health & Place*, 17, 269–279.
- Smith, R.M., Gaston, K.J., Warren, P.H., Thompson, K., (2005) Urban domestic gardens (V): relationships between land cover composition, housing and landscape. *Landscape Ecology* 20, 235–253.
- Velarde, M.D., Fry, G., Tveit, M., (2007) Health effects of viewing landscape-Landscape types in environmental psychology, *Urban Forestry & Urban Greening*, 6, 199-212.

The Use of Green Outdoor Environments for Cardiac Survivors' Rehabilitation Therapy

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heart rate | healing garden | therapeutic landscape |

Malaysian hospital | restorative landscape

The purpose of this paper is to test whether Green Outdoor Environments (GOEs) have the potential to support the rehabilitation therapy of cardiac survivors. The level of understanding on the benefits of using GOEs in Malaysian hospitals is still not at a satisfactory stage, and so this paper aims to close the gap by presenting the evidence gathered from the cardiac survivors' physiological responses that consist of heart rate (bpm) and blood pressure (mmHg). Eighteen cardiac survivors who completed a six-week treatment programme were chosen as the respondents. An exercise, 'walking distance without obstacles' was carried out in the outdoor session, while another exercise, consisted of walking on a treadmill which took place indoors. The patients' heart rate and blood pressure readings were taken using the digital sphygmomanometer. The readings of the patients' heart rate carried out during the outdoor session were higher as compared to the indoor session. However, there were no significant differences in the readings of the patients' blood pressure in both settings. Nevertheless, the positive results in the increase of the heart rate may indicate the possibility of GOEs supporting the rehabilitation therapy among cardiac survivors.

Introduction

Cardiovascular disease is the number one killer across the world and kills 17.3 million people a year (Myers 2015). According to the data by WHO, deaths from coronary heart disease in Malaysia has reached 29,363 or 23.10% of total deaths, and Malaysia is ranked at number 33 in the world for the country with the most coronary heart disease (WHO 2014). Due to this situation, cardiac rehabilitation aims to reverse limitations experienced by patients who have suffered the adverse pathophysiologic and psychological consequences of cardiac events (Singh & Schocken 2015). Rehabilitation in this case refers to the health care services that help a person keep, restore or improve skills and functioning for daily living and skills related to communication that have been lost or impaired because a person was sick, injured or disabled (Marcy et al. 2012).

Currently, the rehab therapy for cardiac survivors in Malaysia uses the equipment provided in the rehabilitation departments' buildings more, with less use of the green outdoor environments (GOEs) as was found within the hospitals' compound. Sufficient evidence indicates that the natural environment plays an important role in supporting people's health and well-being. The present knowledge of the nature and human-health relation in Malaysia is still rather new. Over the past three decades, conducted studies have revealed the benefits of a garden or natural environment, and how by staying within an outdoor environment or nature gave positive impacts especially to those recovering from sickness. Therefore, the aim of this paper is to provide the evidence through the cardiac survivors' physiological responses towards the potential of GOEs in supporting the rehabilitation therapy among these patients.

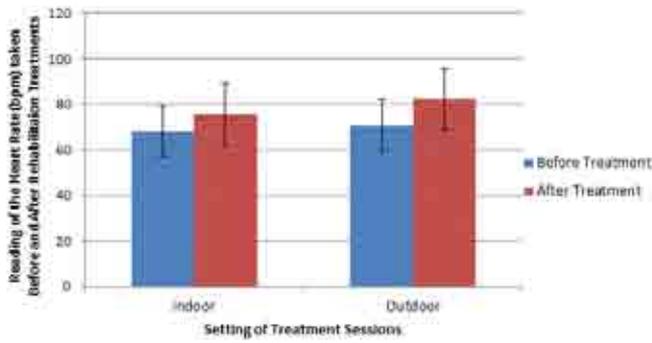


FIGURE 1. The reading of the heart rate (bpm) taken before and after rehabilitation treatments.

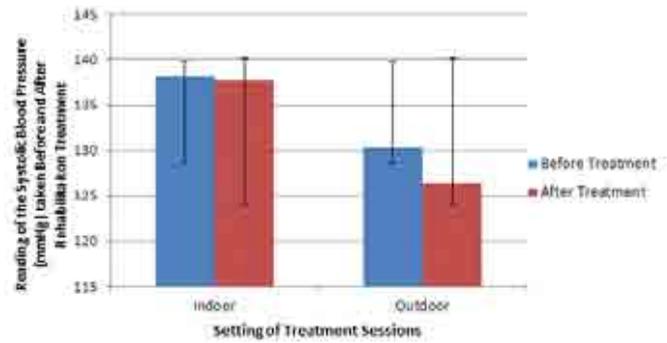


FIGURE 2. The reading of the systolic blood pressure (mmHg) taken before and after rehabilitation treatments.

Methodology

Serdang Hospital is located within a kilometre of the researchers' institution, and was chosen as the study area as the hospital has a rehabilitation programme (CRP) especially for cardiac survivors. At one time the hospital will have 40 cases of cardiac survivors that complete all the six-week CRP treatments provided at the hospital's Department of Rehabilitation. From the 40 cases, 18 cardiac survivors were chosen as the respondents for the comparison study, as these patients were involved in similar treatments (walking exercises) which have taken place both indoors and outdoors. The walking exercise was used, as it is suitable to be carried out both inside and outside. The walking exercises used were the 'Walking Distance' (without obstacles - which was taken place outdoors) and the 'Circuit Training' (using the treadmill, carried out indoors).

The heart rate reading (bpm) and blood pressure reading (mmHg) of cardiac survivors taken before and immediately after the rehabilitation treatment were used as indicators to identify if there were any changes on the readings during the exercises. The CRP was held every morning on Monday and Wednesday for 6 weeks. On both days, the cardiac survivors would undergo the walking exercise in the two settings. The data of the patients' physiological responses were collected from their exercise records during the CRP.

The readings of the heart rate (bpm) and blood pressure (mmHg) were measured using the digital sphygmomanometer. Heart rate and the blood pressure were measured as both have to work in tandem. The reading of the heart rate could act as the indicator to identify which settings show the positive increase in the patients' heart rate while the blood pressure was monitored in order to identify if there was significant differences, as readings below the maximum set level were better for the patients.

Among the 18 cardiac survivors, some only participated in one, and there were those who did more than one of the walking activities within the 6 weeks of rehabilitation treatments. The data for this study was collected using the highest differences in the readings taken from the cardiac rehabilitation exercise records.

The outcomes from the physiological responses were statistically analysed using Statistical Package for Social Science (SPSS) Version 22 and one-way analysis of variance (ANOVA) was applied for the data analysis.

Results and Discussions

A one-way analysis of variance (ANOVA) was carried out to analyse the data from the physiological response's readings of the patients at $P\text{-value} \leq 0.05$. The results indicated that there were significant differences in the heart rate readings (bpm) taken before and after the rehabilitation treatment carried out during the outdoor session. The increase in an average of 12bpm reading for the heart rate of the cardiac patients, when the walking exercise was carried out at the outdoor, may suggested that the change of the setting, such as the GOEs, may possibly influence the positive readings of the heart rate during the rehabilitation treatment. (Figure 1)

As for the blood pressure, the readings were divided into systolic pressure (mmHg) and diastolic pressure (mmHg). Systolic pressure (mmHg) was defined as maximum level of arterial pressure where the highest arterial blood pressure of a cardiac cycle occurring immediately after systole of the left ventricle of the heart (Merriam-Webster 2015). Diastolic pressure was defined as the lowest arterial blood pressure of a cardiac cycle occurring during diastole of the heart (ibid). By using a one-way analysis of variance (ANOVA), the results syndicated that at $P\text{-value} \leq 0.05$, there was no significant differences in the readings of the blood pressure (systolic and diastolic pressure) taken before and after the rehabilitation treatment during the outdoor and indoor walking exercise sessions. (Figures 2 and 3)

The findings from the readings of the systolic and diastolic blood pressure indicated that neither the indoor nor the outdoor gave significant differences towards the patients' blood pressure as compared to the slight increase in the readings of the heart rate when the patients were doing the walking exercise in the GOEs.

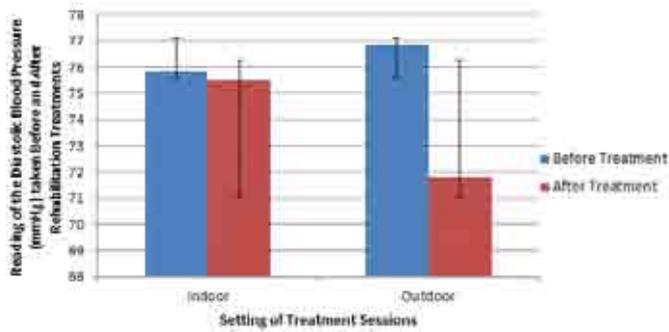


FIGURE 3. The reading of the diastolic blood pressure (mmHg) taken before and after rehabilitation treatments.

Conclusions

Cardiac rehabilitation is important for the cardiac survivors as it has the proven numerous benefits in improving their quality of life. This small experiment may be the starting point for further research in the usage of the GOEs in hospitals. Therefore, more studies should be carried out on the benefits of using GOEs at hospitals and also, on the effects of having rehabilitation treatments in the GOEs on other illness. Hospital staff should also be informed on how the GOEs could be incorporated into the rehabilitation therapy for the patients. The knowledge on the benefits of the GOEs may bridge the gap in deterring under-utilised outdoor spaces at hospitals.

References

- Marcy, S., Garceau, K., & Tomlinson, J. (2012) New York State Benchmark Plan Recommendations. New York State Speech-Language-Hearing Association, Inc., New York Physical Therapy Association, New York State Occupational Therapy Association Inc. Adapted from Fed. Reg. 52530; NAIC Glossary of Health Insurance and Medical Terms: 3.
- Merriam-Webster. (2015). Medical Definition of Systolic Blood Pressure. Medical Dictionary. Accessed on 8th January 2016 at <http://www.merriam-webster.com/medical/systolic%20blood%20pressure>
- Myers, J. (2015). Which Countries have the Most Deaths from Heart Disease? World Economic Forum. Published 2nd. October 2015. Accessed on 15th January 2016. <https://www.weforum.org/agenda/2015>
- Singh, V.N. & Shocken, D.D. (2015). Cardiac Rehabilitation. www.emedicine.medscape.com. Accessed on 15th. January 2016.
- World Health Organisation (2014). Cardiovascular diseases (CVDs). www.who.int/mediacentre/factsheets. Accessed on 15th. January 2016.

The Identification of the 'Nature Index' in Malaysian Landscape

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biodiversity | bird habitat | nature setting | site analysis | sustainable design

The current trend of Malaysia property development promotes natural settings as one of the key attraction that would enhance people's living experience and lifestyle. Nevertheless, throughout the development process, it was a common practice in Malaysia that most of these sites were forced to accommodate and submit to changes due to lack of understanding towards important values that were hidden within the environment. Therefore, a simplified method to identify areas rich with natural characteristic for better living environments and promoting property values was being sought. This paper aims to introduce a technique which could be applied during the site inventory, where areas rich in nature diversity could be identified by using an index or indicator based on landscape characteristics which birds are attracted to. For this purpose, a total of 8 landscape characteristics were short-listed and proceeded for testing. Satellite images from Google map were used for preliminary analysis and ground verification assessment was carried out to confirm the possible match of the landscape characteristics within the study area. Overlay technique was later applied to identify both specific area index and the mean nature index scores. This simple technique intends to bridge the gap between the designers, property developers and local authorities by providing evidence-based design knowledge that could be applied to safeguard natural settings during project development.

Introduction

The recent studies on salutogenic (health creating) effects of the green environment have shown that nature can reduce stress levels, restore powers of concentration and alleviate irritability. Ways to experience visually pleasant physical surroundings which may reduce stress by eliciting positive emotions, sustaining non-vigilant attention, restricting negative thoughts and returning physiological arousal to moderate levels are being sought, particularly by those involved with in the area of built environment all over the world.

In Malaysia, the importance of green environment for healthy lifestyle is getting more attention from the general public. The current property industries are promoting the natural environment in the development as a key selling point to attract potential buyers who are looking for a quality living experience. Therefore, areas rich in natural characteristics are being sought after and highlighted as one of the criteria for new property developments.

The main goal of this experimental study was to highlight to the designers, developers, authorities and to the communities in explaining that maintaining bird habitat and biodiversity is important for health. The study hypothesised that areas rich with natural characteristics may contribute to a better living environment and this knowledge may be the significant factors in promoting up-coming properties. This study intends to identify the landscape characteristics that attract birds which could act as an "Index" for an area rich in nature diversity and to reduce potential disturbance at the site. The paper also intends to provide an evidence-based design knowledge which could be applied to protect the biodiversity of areas to be developed.



FIGURE 1. The study area with 40 x 40m grid cells



FIGURE 2. The total index score map.

NO	TYPE OF LANDSCAPE CHARACTERISTICS	TOTAL CELL	%	RANK
1	structural diversity in vegetation structure	57/123	46.3%	1
2	species diversity in vegetation structure	49/123	39.8%	2
3	long grasses	48/123	39.1%	3
4	natural succession in planting height	43/123	35.0%	4
5	close spacing between trees	40/123	32.5%	5
6	vast space in nature	39/123	31.6%	7
7	physical continuity in space	34/123	27.6%	6
8	the inclusion of water	10/123	8.1%	8

TABLE 1. The landscape characteristics' scores based on total number of cell (x=123).

The idea of using birds' habitat as the guiding rules in order to identify areas lush with natural characters was sparked from the writing of John B. Calhoun (1970) on an article titled 'The Role of Space in Animal Sociology'. Calhoun mentioned that the physical environment has fostered the evolution of other species which have followed along quite a different path but one that similarly precludes any future possibility of cultural evolution for them. Calhoun further explained that research on the behaviour of animals may provide insight into the human condition with regard to either its evolution or its present circumstances. In the book 'Bring back the Bird (Hails et al. 1990), a few design characteristics or settings were listed in which birds were said to be attracted to. A total of eight characteristics were identified, explored and tested in this paper.

Methodology

To conduct the experimental study, a testing site with a total area of 55 acres was selected at the researchers' institution located at the Faculty of Design and Architecture at the Universiti Putra Malaysia (UPM) in Selangor, Malaysia. A map for the study area was obtained from the Google map application and was later divided into 40 meter x 40 meter grid cells (Figure 1). Using this map, preliminary assessment was done for each individual cell in order to identify the

presence of the eight landscape characteristics namely the 1- structural diversity in vegetation structure, 2- species diversity in vegetation structure, 3- long grasses, 4- natural succession in planting height, 5- close spacing between trees, 6- vast space in nature, 7- physical continuity in space and, 8- the inclusion of water. Ground verification assessment was later done to confirm the earlier findings. Photos were taken and crosschecked with the identified landscape characteristics in accordance to the birds' preferred habitats. Each identified characteristics was later assigned with values (1-available, 0-not available). The process was repeated on the map for each of the assigned landscape characteristics. (Figure 1)

The second stage involved the layering process to identify areas high with natural characteristics. This was done by adding each of the landscape characteristics score maps for an individual cell. To further identify the mean index scores, a simple formula was formulated to conduct the analysis. The multiplication values for all landscape characteristics' scores with cell number values will be added and divided with the total cell number thus the mean score will be produced. The calculation can be summarised with the following formula.

Index scores (i) each cell	Total Cell number (40x40m each)	%	Total Index Score
0	13	10.6	0
1	40	32.5	40
2	21	17.1	42
3	11	9	33
4	8	6.5	32
5	7	5.7	35
6	17	13.8	102
7	5	4	35
8	0	0	0
Total	123	100	323
Mean Index Score			2.62

TABLE 2. The mean natural index score for the study area

Nature Index Category	Description of the Site
0.0 to 1.9	LOW in the natural characteristics which may include the minimal presence of vegetation, low or minimal variety in plant species and spacing, low or minimal diversity in the design of the spaces and low or minimal presence of water body
2.0 to 3.9	MODERATE in the natural characteristics which may include the presence of vegetation, limited variety in plant species and spacing, limited diversity in the design of the spaces and low or minimum presence of water body
4.0 to 5.9	HIGH in the natural characteristics which may include abundant vegetation, variety in plant species and spacing, various type of spaces and may have the presence of water body.
6.0 to 8.0	VERY HIGH in the natural characteristics which includes abundant vegetation, variety in species and spacing, various type of spaces and large amount of water body

TABLE 3. Proposed Nature Index Category

Data Analysis and Findings

The first stage of the data analysis involved ranking the landscape characteristics' scores (which were: 1- available, 0-not available) in order to identify the most and least available character based on the total cell number (n=123). Based from the calculation, it can be seen that two landscape characteristics have shown higher percentages which were 'physical continuity in space' (52%) and 'structural diversity in vegetation' (42.3%). In addition, the lowest scores have also been identified which were 'vast space in nature (23.6%) and 'the inclusion of water (8.1%). (Table 1)

The next stage of data analysis involved the layering process for each of the landscape characteristics' maps. The cumulative scores presented in Figure 2 have shown that the maximum index scores for the study area was seven (7) and the lowest was zero (0). The highest two index scores (7) and (6) represents 17.8% from the total study area. This area can be considered as the most potential area for the birds' habitat. On the other hand, index scores (0) and (1) covers more than 43.1% which can be considered extremely unsuitable. (Figure 2)

Meanwhile, the total index scores for the whole area was 323 or 32.8% (Table 2) as compared to the highest possible score (maximum index score was 984). Therefore, the overall mean index score for the study area was 2.62. (Table 2)

As proposed in the description of the nature index in Table 3, the mean index score for the site can be categorised as moderate. In the total index score map, the water body area can be postulated as a significant factor in the birds' habitat distribution at the site. The areas with the lower index score (0-1) were in majority located further away from where the location of the water body was. (Table 3)

Bridging the Gap in the Design Process

There are a number of approaches that can be done to reduce losses in urban areas. One of it is that parks and open spaces should be planned for birds and other wildlife as well as for people. This paper has the intention to highlight these issues and how preserve the biodiversity and at the same highlight the areas rich with natural characteristics to be part of the urban developments.

This technique intends to bridge the gap between the designers, property developers and policy makers by providing evidence-based design knowledge that could be applied to protect the biodiversity during project development. The index is designed as a simple approach and easily downloaded as a tool in the future by landscape architects, architects, developers, planners and policy makers. The 'Nature Index' and the classification level are still in an interim stage. They are currently being developed and undergoing ground testing.

References

- Calhoun, J.B. (1970). The Role of Space in Animal Sociology in: ENVIRONMENT PSYCHOLOGY: MAN AND HIS PHYSICAL SETTING, Proshansky, H.M., Ittelson, W.H. & Rivlin, L.G. (Eds). Holt, Rinehart and Winston, Inc., New York (pg. 195-202).
- Hails, C.J., Kavanagh, M., Kumari, K. & Ishak, A. (1990). BRING BACK THE BIRDS, WWF Projects, Kuala Lumpur.

R-Types – Development of a Typology of Recreationists as a Base for Planning and Design of Nature-Based Recreation Areas

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r-types | recreation | recreation areas | visitor survey | landscape planning

Recreation planning is an important aspect of landscape planning. The population of densely populated urban and peri-urban areas relies on the presence of attractive nature-based landscapes close to nature and open spaces. A central aspect in the planning and design of recreation areas is the inclusion of the needs of the population. Against this background, the aim of the project “R-Types” is to assist landscape architects in planning and designing attractive recreational landscapes. First, a visitor survey will be carried out in five selected test areas in Switzerland. In parallel, an online survey will take place. Secondly, a classification of recreational areas in Switzerland is created on a qualitative basis. This enables specific recreation types to be assigned to each class of recreational areas. Based on this, type-specific measures to protect sensitive natural areas are developed.

Initial Position

Recreation planning is an important aspect of landscape planning. The population of densely populated urban and peri-urban areas relies on the presence of attractive nature-based landscapes close to nature and open spaces (Buchecker et al. 2012). A central aspect in the planning and design of recreation areas is the inclusion of the needs of the population. Motives and expectations of recreationists regarding health, exercise, nature experience and relaxation play an important role (Sijtsma 2012). Another important aspect is the prevention of conflicts among recreation seekers themselves, and with flora and fauna in ecologically sensitive areas (Mönnecke et al. 2006). One option to research would be the demand side, to build a typology of recreation seekers. Such an approach is widely applied in tourism and leisure science, but until now has not been widely applied in landscape planning. Already in the 70s, two landscape architects developed a system of recreationists. Since then, however, the topic remained untouched (Fingerhuth et al. 1973). Against this background, the aim of the project “R-Types” is to assist landscape architects in planning and designing attractive recreational landscapes.

Methodology

First, a visitor survey will be carried out in five test areas in the Swiss cantons of Glarus, St Gallen, Zug and Zurich and in the town of Zurich. The key questions relate to visitor frequency, reasons for visiting, preferences, needs and activities of recreationists. By means of a cluster analysis, a typology of recreationists will be developed on this base of data. This survey will take place between May and August 2016.

In parallel, an online survey will take place. For this survey, the platform <greenmapper> is used in collaboration with the University of Groningen. This is a Google Maps-based map application, which is accessible for everyone via the internet.

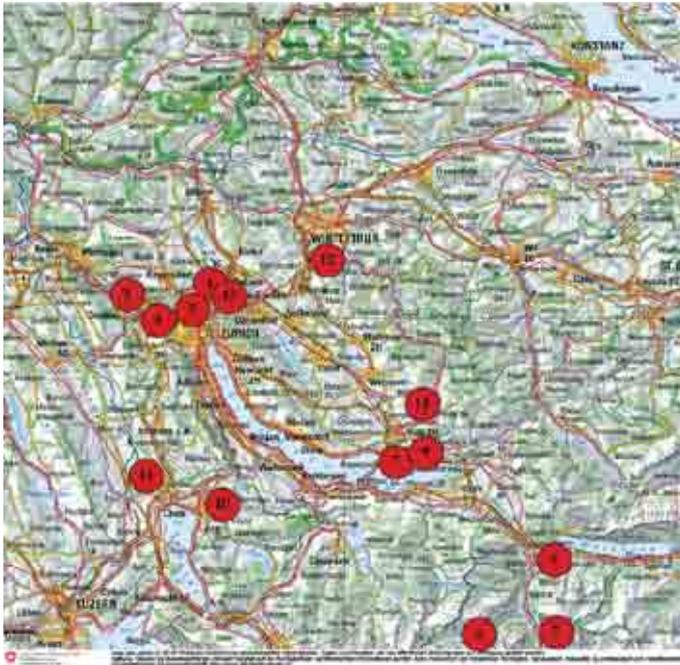


FIGURE 1. Test areas



FIGURE 2. Recreation at the lake of Zurich

The advantage of this tool is that respondents draw their preferred nature-based recreation areas directly on a map and evaluate it by means of a questionnaire. With the combination of geo-referenced data and answers of respondents, a number of spatial analyses can be performed and the results can be presented cartographically (Sijtsma 2012).

Secondly, a classification of recreational areas in Switzerland is created on a qualitative basis. The criteria are landscape character, types of protected areas, accessibility, recreation infrastructures and preferred activities by visitors. This enables specific recreation types to be assigned to each class of recreational areas. Based on this, type-specific measures to protect sensitive natural areas are developed and compiled in a manual for planners.

Expected Results

Recreation types are based on a few distinctive features that are constituted by a class. Distinctions here are often less the actual relationship, but a phenotypic or phenomenological classification by analogous properties. While they may have a similar appearance, they are not necessarily related. Moreover, these characteristics are never equally pronounced among all objects of a class, but they range from the “ideal type” to weak marginal types, so that a clear demarcation is generally not possible. In most cases there are objects whose assignment is contestable, if not impossible. Recreation types are based not only on classic sociodemographic segmentation criteria (such as age, sex, occupation, etc.), but also on particular similar motives (desires, expectations), behaviours, forms of leisure and activities.

Basic Orientations in Recreation

From the point of recreation seekers, the need for silence, but also opportunities for sports and exercise is important. Slow,

contemplative activities on one side and quick activities on the other side often face each other.

Some of the recreationists, show interest for information and knowledge (e.g. nature, culture, history), others have the desire to relax and for leisure.

Together with the interest for individualistic (sports) activities, the need for social and communicative meeting places exists. Recreation areas are important meeting places in public space.

Quality of Recreational Areas

Nature-based recreation areas should on one hand provide recreation seekers the opportunity for contemplation with quietness and wideness, whilst also space for activities (encounter, sports, children's play, etc.). The security and manageability of the recreation area is also important. It is expected, that key factors for attractive green spaces are usability, accessibility and infrastructural facilities.

In nature-based recreation areas, the local population expects unspoilt nature and a landscape with cultivated areas, which also includes natural “wild” elements. Depending on the predominant use in the recreation area, the need for (adapted and landscape-sound) infrastructures (such as walking paths /trails, running tracks, cycle paths / bike trails, benches, fireplaces etc.) is gaining importance.

Information possibilities about nature, culture and landscape with themed trails, leaflets, brochures, audio guides, etc. may not be equally important for all recreation seekers, however there is a segment among recreationists, who especially wish for such information services.

Nature Conservation

Potential conflicts between recreational use and fauna / flora should be minimized with good visitor management, from the perspective of acceptance amongst the local population, soft measures (such as information, products) are preferred to harsh bans. A large proportion of recreation seekers are already quite well aware of the concerns of nature conservation and observe the rules of conduct, where known and realistic.

Many recreational areas include nature conservation objects and are wholly or partly under a statutory protection. For now, this restriction provides an opportunity in the planning of recreational areas, in the sense that authorities have an option to handle regulations (e.g. no dogs allowed, defined beach etc.).

Access to the Recreation Area

From the perspective of those seeking recreation, nature-based recreational areas should be easily accessible, preferably in a walking, and a relatively short distance from the living place. The quality of the road to the recreation area also plays an important role (landscape quality, road crossings etc.).

Well-developed access for non-motorized traffic is important for recreation seekers, beside footpaths, this applies especially to secure and attractive bicycles routes and other rolling means of transportation (separation from the road, secure road crossings, no stairs etc.).

Discussion

In the 1970s, Fingerhut & Schwarze (1973) developed a typology of recreation seekers which was taught at Swiss universities until recently. Based on the initial results of the study, a number of significant differences can be identified:

- New multiform ways of life and lifestyles have emerged. Leisure is today more than just a testing ground of lifestyles in the context of changing values and the new search for identity. Recreational areas as public spaces therefore become design spaces for self-appropriation of the population.
 - The leisure and recreational needs of the population have become more diverse and sophisticated, within each recreational use but also with regard to leisure behaviour in general. This leads to implications with respect to traditional and new recreational demands and their consequences.
 - Population growth and structural densification processes in agglomerations and the associated loss of open spaces lead to a new starting position ("density stress"). Nature-based recreational areas as compensation spaces close to settlements gain strongly increasing importance.
 - Outdoor sports plays and active leisure activities gain increasing importance, keywords are "exercise" and "health". New sporting activities and events emerged, combined with modern sports equipment and technical utilities. Thus, the market for outdoor equipment is of great economic importance.
 - The importance of the time factor has changed. Nature-based recreation areas are now more frequently visited by more people than before, but the duration of stay generally decreased. The closer the recreation area is to the place of residence or work, the more often and shorter are the visits.
- The recreation target groups are changing. The distribution of generations has shifted, the proportion of over-fifties and pensioners has now increased. As well as this the share of recreation seekers with an immigrant background continues to increase, the (cultural) origin of migrants has changed.
 - The forms of mobility have changed, on one hand the level of motorization increased, but on the other hand non-motorized traffic has become more important and new opportunities are created. In many places, the accessibility of recreational areas has been improved with new public transport offers.

In this context, the development of new recreation types will create new opportunities for landscape planning. Planning guidelines as part of the project will make the results applicable in practice.

References

- Buchecker, M., Degenhardt, B., Kienast, F. (2012). The interaction between landscape qualities, residents' outdoor recreation, and their well-being. In: Bauer, N., Mondini, M., Bernasconi, A. (eds). *Landscape and Health: Effects, Potential and Strategies*. Birmensdorf.
- Fingerhuth, C., Hesse, S. Knops, H-G., Schwarze, M. (1973). Arbeitsmethode zur Bewertung der Erholungseignung eines landschaftlichen Angebots für verschiedene Typen von Erholungsuchenden. In: *Landschaft und Stadt*, 5. Jg., 161-171.
- Mönnecke, M., Schubert, B., Wasem, K., Spiess, H., Kümmin, D. (2006). Ansprüche von Naherholungsuchenden und deren Berücksichtigung in verschiedenen Arten von Planungsinstrumenten. Projekt im Rahmen des WSL-Programmes 'Landschaft im Ballungsraum'. Rapperswil, Winterthur.
- Sijtsma, F., Daams, M., Farjon, H., Buijs, A. (2012). Deep feelings around a shallow coast. A spatial analysis of tourism jobs and the attractiveness of nature in the Dutch Wadden area. In: *Ocean & Coastal Management* 68 (2012), 138-148.

Landscapes of Water – How can Mapping in Inundation Areas Create new Planning Tools?

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flooding | hydrology mapping | climate change | planning tools

The effects of climate change in Scandinavia lead to more rain in shorter periods of time, giving water management a central role for future urban planning. With limited resources and in fragile ecosystems, the premise for design is to do minimum intervention to obtain a maximum effect. The priority of the designer is therefore to observe and read nature's own processes, in order to understand where and how to intervene.

At present, representations of watersheds focus on certain aspects, thus, only facilitating some of the opportunities for mediating between urbanisation and natural systems.

This research develops a mapping that combines inputs from hydrology, geology, biology and climatology and focuses on the possibility of retention of water within the landscape. It seeks to bridge the gap between theory and practice through case studies, introducing an expanded reading of the presence of water. The mapping developed in the research suggests a tool for future land-use planning, and gives insight into where and how to intervene.

Research Question

How to map the landscape's water absorption capacity in inundation areas in order to create a tool for land use planning?

This paper is part of an overall research into the development of tools for a water integrated urban planning (see e.g. Shannon et al. 2008). This specific paper looks into the question of the terrain's capacity for water retention within a watershed, in an area of inundation.

Background

An investigation into sustainable land-use planning in Norway carried out by the National Audit Office (NAU 2006) shows that the planning of future land-use frequently does not follow national sustainability targets, in which watercourses are regarded as valuable for biodiversity and recreation. The national guidelines underline that it is of special importance that interventions within the protected rivers and waterways should be avoided, but the survey by NAU shows that there has been increased construction along the rivers from 1985 to 2006. In fact, this increase has happened to the same extent both in protected as well as in non-protected areas.

Existing planning tools guide the project development towards sustainability – for example the “Blue Green factor”, which evaluates how efficient the project is in reducing water run-off and to which extent it introduces vegetation within the urban fabric. This is a useful tool for ecological mitigation, but the fundamental question: is this the right spot to build – is decided within overall land-use regulation. The NAU investigation has shown that there often is a gap within land-use planning, between intentions of sustainability and action. The aim of this paper and the mapping of water absorption capacity is to make explicit the relations between land-use and flooding.



FIGURE 1. The localisation of the case study area of Ellingsrudåsen in the Eastern suburban Oslo. The red line defines the border between the urbanised areas and the protected natural reserve Marka, defined by the height of +220m up to which it was possible to pump the water when Marka was established in 1934.

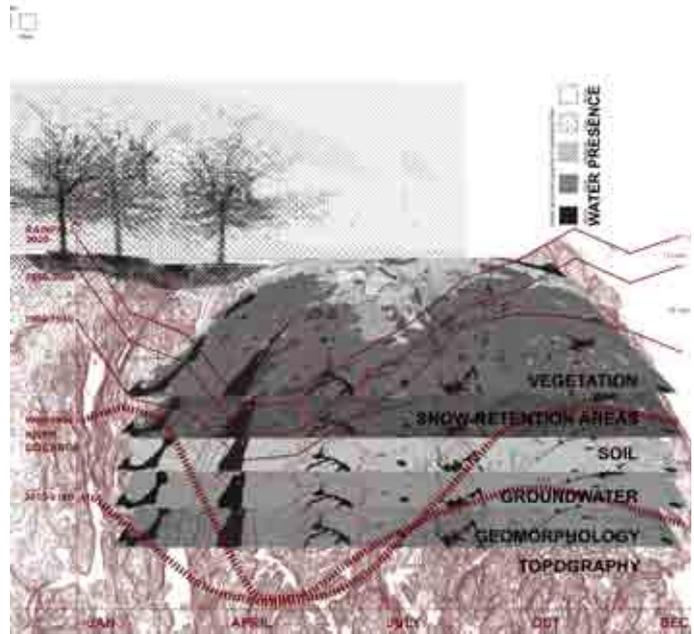


FIGURE 2. Illustration of the layers considered for the water retention capacity of the landscape. The darker the higher capacity of absorption of the water.

Working Methods

The research is done through a case study in order to create an in-depth understanding of a contemporary, context-related question (e.g. Bromley 1986), such as the relation between inundation areas and the built up environment. The case study investigates a contemporary phenomenon (Yin 2013) where the reading of the sequences of change in the landscape gives a part of the answer to:

- How the presence of water can be better visualized?
- How different land uses influences the water logic?
- How the logics of water can inform future planning?

The case study area, Ellingsrudåsen, is chosen as a characteristic example of flood risk and urban pressure, situated between the Oslo city centre and the Gardermoen Airport. Relevant factors affecting water flow are geomorphology, landform, vegetation and climate (Alberti 2008:133), as well as ground water and the retention areas of snow. These are represented as layers that are graded in three absorption levels: high, medium and low.

James Corner comments, in the book *Mappings* edited by Denis Cosgrove on the Agency of Mapping (London 1999 p:213), the need for a revision of mapping practice which can reveal and realize hidden potentials.

The mapping of water as a fluid element that crosses administrative borders asks for a new reading that follows its logics. The delimitation of the case study area, is defined by the greater watershed affecting the presence of water as well as the hidden layers that retains the water.

The main data sources are the Norwegian Water Resources and Energy Directorate (NVE), the Geological Survey of Norway (NGU) and Norwegian Institute of Bio Economy Research (NIBIO).

The mapping is done with GIS, and the collected digital data and its coherence is verified through fieldwork.

Archives are used to identify newspaper articles and reports on flooding in order to identify the frequency and the effects of these water related events.

The mapping of the absorption capacity of the territory is cross-disciplinary, therefore interviews are conducted with experts in disciplines of geomorphology, hydrology, climatology and ecology, in order to verify conclusions.

Interviews with the planning department of the municipality of Lørenskog reveals the potential role of the water sensitive mapping within planning, and how it can reveal the relation between the composition of the landscape and the newly built impervious surfaces, and the flooding that becomes increasingly severe.

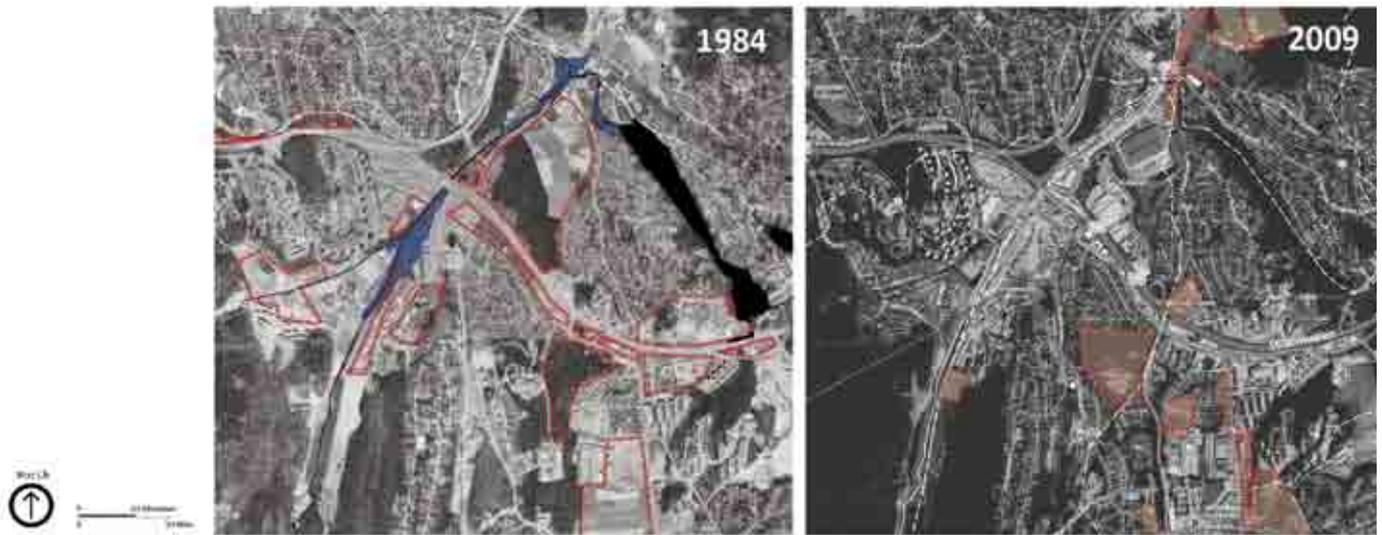


FIGURE 3. Aerial photo of the case study area from 1984 and 2009. The marked areas show how the newly built zones are developed close up to the inundation areas (marked with blue along the normal water level marked in black) and consuming the retention capacity of the agricultural land and the forest nearby. In the photo of 1984 the marked areas correspond to what has been built between 1984 and 2009. In the photo of 2009 the marked areas correspond to what is planned to be built in relation to the municipal plan.

Results

The study shows that even though flood risk is well documented, urban expansion – comprising industry and logistics facilities – has nevertheless occurred over the last thirty years within these areas.

In the specific case study of Ellingsrudåsen the absorption capacity is close to zero, there is a scarcity of ground water capacity due to a ground morphology of rock and a thin earth layer. This means that, in this specific case, vegetation is of extreme importance in order to retain water.

The urban expansion in the case study area has taken place on former woodland, accentuating the flood risk while reducing the area's former absorption capacity. The introduction of new buildings in these areas, not only puts just the buildings at risk but also aggravates the flooding, putting the mobility infrastructure of the area at risk and affecting the adjacent train and road system.

Conclusion

The current planning tool of the “blue green factor” is inspired from the German development of the green factor (Biotopflächenfaktor) and how this has been implemented in Sweden (grönytefaktor in Malmö and Green area factor in Stockholm). The Norwegian model develops the water issue further, but my research reveals that, beyond the focus on water, more factors should be inserted, such as the role of the topography. The inundation at Ellingsrudåsen 2015, was due to the heavy rains that persisted over a long period, where the surrounding natural reserve Marka became saturated and the water reached the low points of the territory.

The mapping of the landscape's water absorption capacity at Ellingsrudåsen make explicit the site specific composition of the landscape that has to be reflected in the land use planning. The superposition of the layers mentioned above, reveals the landscape absorption capacity within flooding areas that should be taken into account in land-use planning within areas of inundation. This is the core component for the development of a future tool, that will be part of the overall PhD research.

References

- Alberti, M., 2008. *Advances in Urban Ecology: Integrating Humans and Ecological Processes in Urban Ecosystems*, 2008 edition. ed. Springer, New York.
- Corner, J., 1999. *The Agency of Mapping: Speculation, Critique and Invention*, in: *Mappings*. Edit. Denis Cosgrove, Reaktion Books, London.
- Plan og bygningsetaten, Oslo Kommune, Bærum Kommune, Dronningalandskap, COWI, C.F. Møller, 2014. *Blågrønn Faktor. Veileder i byggesak*. Hoveddelen.
- Plan- og bygningsloven (PBL), 1994. *Rikspolitiske retningslinjer for vernede vassdrag*.
- Riksrevisjonen, R., 2006. *Riksrevisjonens undersøkelse av bærekraftig arealplanlegging og arealdisponering i Norge*. The National Audit Office (NAU) investigation on Sustainable land-use planning in Norway.
- Shannon, K., De Meulder, B., D'Auria, V., Gosseye, 2008. *Water Urbanism*, UFO1 ed. Sun, Amsterdam.
- Synthesis Report, IPCC, 2014. *Climate Change*.
- Yin, R.K., 2013. *Case Study research: Design and methods*. Sage publications.

People's Preferences for Outdoor Affordances are Relatively Similar Irrespective of Cultural Background

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perception | recreation | restoration | city planning | park management

The research question addressed in the present paper is to what extent preferences for landscape affordances differ between people who have grown up in completely different cultures and landscapes. How universal are preferences for certain sensory dimensions? Two Master's students at SLU Alnarp, who grew up in completely different landscapes (Huanggang, China, and St. Petersburg, Russia, respectively) distributed questionnaires in their home towns, asking respondents about their use of parks and preferences for certain characteristics: serene, wild, lush, spacious, the common, the pleasure garden, festive/centre and culture. Both showed that the availability of characteristics at existing parks varied considerably. However, what people wanted from the parks was very similar despite differences in respondents' cultural background.

The two questionnaire datasets were merged into one dataset (n=309, primarily between 18-35 years of age), enabling us to analyse to what extent similarities in existing qualities and respondents' preferences are significant. The supply of five of the eight characteristics in urban green areas differed significantly. However, the demand for certain qualities in urban green areas differed only for pleasure garden and festive/centre. The demand for all of the other six characteristics was significantly similar.

The respondents in both cities wanted to experience more of five characteristics: serene, wild, the pleasure garden, spacious and lush. These five are assumed to help restore visitors from stress-related symptoms. The explanation may be that the young generation of today is not under-stimulated, but rather over-stimulated.

Background

Preferences for certain landscape qualities are different owing to people's experiences of their own childhood landscapes. However people's need to relax, recreate, play, visit each other and be stimulated are universal. The question was: To what extent are differences or similarities in preferences for landscape affordances significant for people who have grown up in completely different cultures and landscapes? How universal are preferences for certain sensory dimensions?

Two Master's students at SLU Alnarp, who grew up in completely different landscapes in China and Russia, respectively, distributed questionnaires in their own home towns asking respondents about their use of parks and their preferences for certain qualities. The studied cities are Huanggang in Wuhan and St. Petersburg. The questions concerning the supply and demand of park qualities were similar (Wen 2012; Aleksandrova 2013). They focused on characteristics/affordances or perceived sensory dimensions, as defined by Grahn and Stigsdotter (2010). The sensory dimensions are 1) *serene* – where we can hear the sounds of nature; 2) *wild* – where we can be fascinated by untouched nature; 3) *lush, species rich* – where we can experience variation in vegetation and animal life across the seasons; 4) *space* – where we feel like we are entering into another world, a coherent whole without sharp contours, disturbances or signals that demand attention; 5) *common* – where we can engage in common activities; 6) *pleasure garden* – where we, while enclosed and secure, can enjoy a feeling of safety; 7) *festive/centre* – where we can visit with other people, at squares, meeting places and cafeterias/restaurants; 8) *culture* – where we can experience traces of previous generations' lives.

Both studies showed that the availability of perceived sensory dimensions at existing parks varied considerably. However, what people wanted from the parks, expressed as sensory dimensions, was very similar (Skärbäck et al. 2015).

Characteristics	Supply		Demand	
	Percent of what they have		Percent of what they want to have	
	Huanggang	St. Petersburg	Huanggang	St. Petersburg
	Qualities you usually go to?	Is good in St Petersburg?	Most important for you?	Most important for you?
Serene	63*	*22	83	87
Wild	33*	*5	56	58
Lush	18	16	31	35
Space	37	31	59	58
Common	64*	*41	44	46
Pleasure garden	44*	*21	71*	*57
Festive/Centre	42	42	36*	*14
Culture	18*	*42	21	20

** = Significant difference

TABLE 1. Percentage of respondents who reported having the characteristics, as compare with percentage of respondents who expressed their desire to have them.

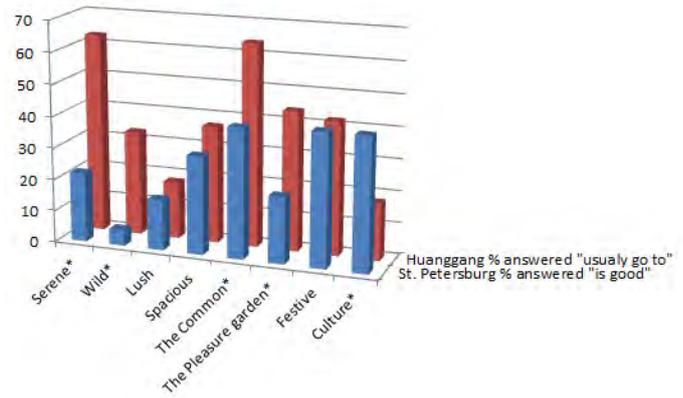


FIGURE 1. Proportion of perceived existing qualities 2011-2012, *= significant difference.

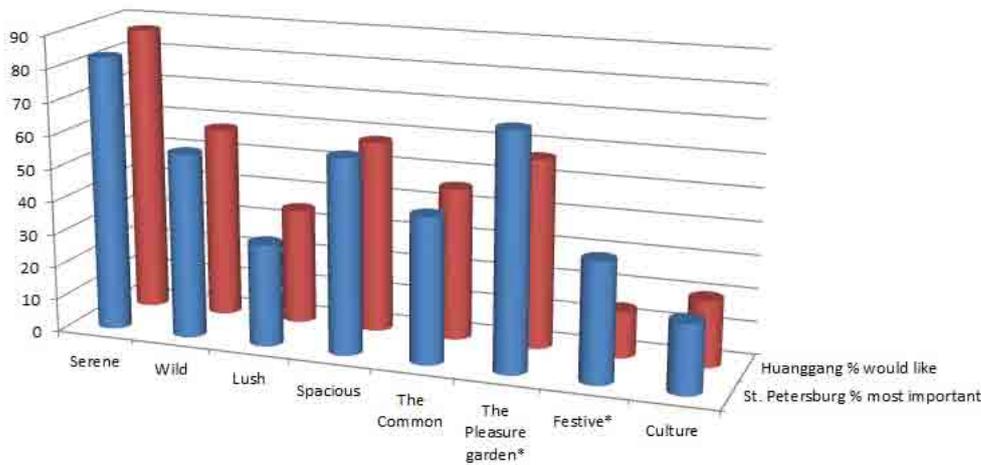


FIGURE 2. Proportion of expressed opinions concerning what is important, what they want to have, *= significant difference.

Results

We have merged the questionnaire data from the two theses into one dataset (n=309 of which 148 are from the Huanggang study and 161 from the St. Petersburg study), enabling us to analyse the entire dataset and compare the existing qualities and the respondents' preferences. Most of the respondents were between 18 and 35 years of age (Huanggang: 84%/St. Petersburg: 89%). Gender was rather equally distributed. The percentage of women was 45% for Huanggang and 62% for St. Petersburg. The results are summarized in Table 1. The results are presented more illustratively in Figure 1 and Figure 2.

As seen from Table 1 and Figure 2, five of the characteristics were perceived to different degrees (significant differences) by the respondents in the two cities (2011 – 2012). However, the demand for characteristics differed significantly only for pleasure garden and festive/centre. The demand for all other six characteristics was significantly similar. In a previous study in Sweden, Grahn and Stigsdotter (2010) showed that serene,

wild, and pleasure garden are significantly correlated with a low level of stress, and the correlation for spacious approached significance.

Figure 2 shows that serene, wild, spacious and pleasure garden are the most prioritized sensory dimensions for both cities, St. Petersburg and Huanggang. Figure 3 shows a measure of balance, as the difference between Figure 1 and Figure 2, simply expressed as Figure 2 minus Figure 1.

The respondents in Huanggang and St. Petersburg wanted to experience more of five characteristics: serene, wild, the pleasure garden, spacious and lush. All of these characteristics are restorative, thus stimulating the parasympathetic nervous system. The respondents did not want more of the festive/centre affordance.

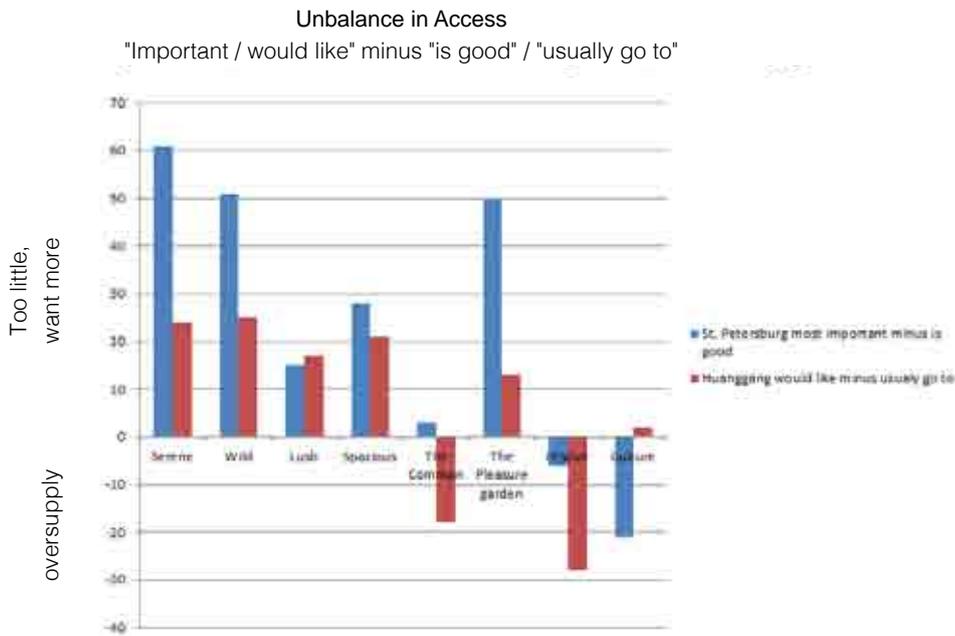


FIGURE 3. Bars point up if there is an underbalance, meaning that the respondents want more of those affordances. In contrast, bars pointing down mean that the respondents do not prioritize having more of those affordances.

Discussion

The affordance festive/centre, in some contexts called social, was negatively correlated with stress reduction (Grahn and Stigsdotter 2010). Note that the respondents were rather young. Some people may expect young people to want more festive and fewer restorative characteristics, assuming that the latter is boring and would not be sufficiently stimulating for young people. However, the explanation may be that the young generation of today is not under-stimulated, but rather over-stimulated. This may be a consequence of rapid IT processing and the global competitive labour market, which are constantly pressuring students, recent graduates and all other working young people to establish a career. The highest levels of stress in Sweden have long been found in the age group 35-44 years. Today, however, the fastest increase in stress appears in the younger age groups, 18-34 years.

This is important, because the predominant opinion and trend today is to densify cities, which often results in loss of open spaces and serenity. Some developers try to argue that quality may be more important than quantity, thus implicitly arguing for giving low priority to the size of open spaces (Grahn 2012). However, studies have shown that large size is one of the most important qualities (Skärbäck et al. 2014).

But stress reduction is not the only reason to defend our open space green qualities. Studies have shown that stays in green environments that afford certain sensory dimensions improve our concentration ability, short-term memory (Ottosson and Grahn 1998), and cause us to show a higher degree of empathy toward the people around us (Grahn 2008). Such qualities would probably cause staff at skilled workplaces, such as university campuses and business parks, to become more cooperative and creative, together, at their workplace. Thus, another economic reason to defend our open space green qualities is to improve real estate qualities for recovery at

workplaces and to increase wellbeing and productivity. Now is the time to hold debates on this in relation to all scales of comprehensive urban planning, particularly because the recent policy of urban densification may be resulting in reduced qualities in the outdoor environment.

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Formas: Green infrastructure for ecological sustainability and human wellbeing
 Swedish University of Agricultural Sciences, SLU

References

- Aleksandrova, S. 2013. Sustainability principles for St. Petersburg landscape with Scandinavian experience in mind Master Thesis, SLU Alnarp, 2013.
- Grahn, P. 2007. Barnet och naturen. Ur Utomhuspedagogik som kunskapskälla, Studentlitteratur. -07.
- Grahn, P. & Stigsdotter, U.K. 2010. The relation between perceived sensory dimensions of urban green space and stress restoration. *Landscape Urban Plan* 94:264-275.
- Kaplan, R. & Kaplan, S. 1989. *The Experience of Nature*. Cambridge.
- Ottosson, J. and Grahn, P., 1998. Utemiljöns betydelse för äldre med stort vårdbehov. Licentiatavhandling för Ottosson, J. *Stad & Land*, nr 155. Alnarp.
- Skärbäck E., Björk J., Stoltz J., Rydell-Andersson K., Grahn P. 2014. Green perception for well-being in dense urban areas - A tool for socioeconomic integration. In: *Densification as a planning strategy*, editors: Madeleine Granvik, Per G. Berg, Anni Vartola, Claus Bech-Danielsen. *Nordic Journal of Architectural Research* No. 2 (2014), Vol. 26.
- Skärbäck E. Wen L., Aleksandrova S., Grahn P. 2015. THE SERENA AND OTHER AFFORDANCES IN DEMANDING CONTEXTS, in: *History of Future*. Editors Maria Ignativa et al. 52nd World Congress of International Federation of Landscape Architects. St. Petersburg, June 2015. Conference paper.
- Wen Lu. 2012. Discussion of "The Eight Characteristics" in Huanggang City Master Thesis, SLU Alnarp 2012.

Putting People First! Exploring How to Improve Public Participation in Planning: Case Studies from Latvia and Estonia

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public participation in planning | decision-making |
facilitation and dialogue | understanding community dynamics

Landscape planning requires the incorporation of stakeholders into the process, but how this is done and how to engage stakeholders in a meaningful way needs careful consideration. Several questions need to be asked: who is engaged, at what stage and how? Despite the message over several years that meetings do not work, there is still a reliance on meetings to inform stakeholders, which rarely engages the people most affected by the plans. When stakeholders do not attend it is often assumed that people do not care about their environment. Understanding stakeholders' decision-making - both the rational and irrational processes - will help planners to engage better with communities. Additionally, using artists and storytellers to help to articulate people's desires and thoughts regarding their environment has the potential to open communication channels between stakeholders and planners leading to greater legitimacy and relevance of landscape planning.

Introduction

Landscapes are a product of the interactions of people who live, work or visit an area on the elements that comprise that landscape (Council of Europe 2000). Even the natural environments, which are perceived to be pristine are impacted by people to some degree (Buller 2004). Invariably, therefore, any planning process will have an influence on people as stakeholders in that process and as such they need to be included in a meaningful way.

How stakeholders are included and at what stage, are crucial questions. How ordinary people, without the knowledge of planning, are incorporated practically into the sometimes lengthy, process requires careful thought and creativity, in order to prevent process fatigue or lack legitimacy (Fox & Murphy 2012). Teaching in landscape planning has to go beyond the nuts and bolts of the planning process and re-imagine putting people at the heart of the process. Building scenarios for people to choose from or factoring in frequent consultation meetings with inhabitants is not enough and may represent "Tokenism" on Arnstein's ladder of citizen participation (Arnstein 1969).

This paper presents some results and reflections arising from a recent study of sense of place in rural Latvia and Estonia. It started from the premise that despite the fact that people care deeply about their landscapes, they are unwilling to spend their time attending meetings. Meetings were described as "a headache" and often it was felt that meetings served no purpose, as people felt the decisions had already been made. The traditional meeting format does not facilitate stakeholder engagement and therefore there needs to be a focus on finding innovative ways to walk people through the process.



FIGURE 1. Artists and rural inhabitants working on depicting their story.

Study Approach and Method

Rural municipalities in Latvia and Estonia were selected for study on Sense of Place and a series of interviews were held in each in order to uncover their attitudes to involvement in local landscape planning decisions. In addition workshops were held with a Latvian NGO, Ūdenzīmes to explore paths for development relevant to their community.

Results and Discussion

Enabling and supporting stakeholders to generate their own plans and allowing them to be intimately involved in the process is both challenging but necessary to produce plans that practically serves the communities. An example comes from Ūdenzīmes, who recognised that physical dereliction at the heart of a community was reinforcing the sense of isolation of inhabitants. They worked with the inhabitants to campaign to have an abandoned and decaying Soviet-era dairy removed from the centre of the village of Kaldabrūna. This action signalled to the inhabitants that change was possible through their own efforts – a turning point. Self-esteem rose and there has been an on-going process of transformation of the locality, through artistic input in terms of creative ideas and workshops. Recently, material from abandoned buildings have been remade into beautiful objects to support the local economy – a useful allegory for inhabitants to demonstrate that even objects perceived as useless can be renewed and made useful again.

Encouraging the use of the creative arts to articulate plans and the various stages of planning aids communication. One of the workshops conducted by one of the authors demonstrated the synergies that could arise by bringing artists together with inhabitants of small villages in Latvia. Workshop attendees were encouraged to tell their stories with the assistance of the artists. This was interpreted in different ways, but it opened up possibilities relevant to the local area. A local legend of a dried up river led to the concept of a festival along the “ūdens ceļš” (river road) incorporating local produce into the theme. An

artist together with a farmer reconceptualised promoting the farm by displaying the farm animal pictures on an oak tree – a significant tree in Latvian culture. Excitement was generated through these synergies that novel ideas were possible even in small communities (Figure. 1). The pictures created by the artists are a visual reminder to the community of the ideas they created and the plans to bring these ideas to fruition can be tracked through visual representations.

There is also a need to understand behaviour and decision-making in communities, both the rational and irrational aspects (Lertzman 2015). As Lertzman (2015:41) argues “research methodologies need to ‘get underneath’ and uncover the often contradictory, inconsistent, irrational, affective and complicated ways in which people engage with our most pressing environmental challenges.” This, she argues, aids better engagement design with the communities and structure the communication with “relevant insight.” This requires taking note of psychosocial techniques for listening to the community, their fears and their hopes, as well as their practical suggestions. The recent rage across the EU demonstrates that communities do not feel listened to and this desperately needs addressing.

Prior to the dairy removal in Kaldabrūna, work to improve the local economy could have been hampered by existing poor self-esteem and feelings of hopelessness. The capacity of the village inhabitants to participate in development planning has been improved through local business generation, creative workshops and an annual hay sculpture festival. These activities have built participatory and collaborative skills, the development of administrative skills through holding workshops and festivals and creative skills have been ignited. Over time the capacity to participate has been increased as people began to feel their voice was important to the direction of the NGO and they had something worthwhile to contribute.

Conclusions

Landscape planners need better skills and should embrace non-normative approaches in situations where public processes are poorly developed and social capital is weak, as in many places in Latvia and Estonia. Better teaching should enable future landscape planners to understand the community dynamics, such as networks and power structures that may aid or inhibit development. As the sense of place study highlighted, gatekeepers can affect the flow of communication in a village. Thus, identifying supportive gatekeepers within the community could be useful as entry points to facilitate communication, or could alert planners to possible opposition or potential for elite capture by those in power.

Teaching could benefit incorporating these various elements of deep listening through the use of psychosocial techniques and communication development through collaboration with artists into curricula. Learning to listen, and opening up communication channels through the use of creative exercises and enabling and supporting inhabitants to articulate and take their own steps in developing the plans that affect their landscapes, will assist future planners to engage better with the communities. As Lertzman suggests “Engagement is about creating contexts for creative, authentic participation”. Therefore, if we start with the supposition that stakeholders are concerned about the landscapes they live in, but the onus is for us as planners to enable people to develop the language and skills to articulate the changes they want, we will take greater care to seek out and involve the stakeholders along the path to creative change in landscapes or sustainable preservation if that is required.

By putting people first the language changes from “How do we overcome apathy or get people to come to meetings?” to “How do we draw out the care and concern for the landscape?” “How do we help local people to articulate their aspirations for the landscape?” Through listening to people, landscape planners will be in a unique position to be able to articulate people’s desires and needs with respect to their landscape in creative and innovative ways.

References

- Arnstein, S.R., 1969. A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), pp.216–224.
- Buller, H., 2004. Where the wild things are: the evolving iconography of rural fauna. *Journal of Rural Studies*, 20(2), pp.131–141. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0743016703000585> [Accessed January 30, 2014].
- Council of Europe, 2000. European landscape convention, Strasbourg. Available at: http://www.coe.int/t/dg4/cultureheritage/heritage/Landscape/Publications/Convention-Txt-Ref_en.pdf.
- Fox, C. & Murphy, P., 2012. Sometimes Less Is Better : Ethics of Public Participation. *Environmental Practice*, 14(3), pp.212–219.
- Lertzman, R., 2015. *Environmental Melancholia*, Hove: Routledge.

Overcoming the Institutional Approach to Protection Through Landscape Modeling

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modelling | protection | landscape vulnerability | landscape sensitivity

In this paper we discuss that interdisciplinary approaches, which simultaneously comprise and adjust methodologies of different disciplines and which deal with landscape directly or indirectly, should be applied in the various spatial analyses. The challenge presented is to overcome the standardized approach to protection in order to achieve integral and generally accepted spatial development. This paper also argues that landscape modelling allows such an interdisciplinary approach, and provides the necessary conditions for the development and protection of existing and potential landscape qualities.

The analysed example of landscape modelling in Croatia posits that the landscape vulnerability models in its scope embrace the values and facts of different disciplines with public values and aspirations, while embedding them into the analytical procedure.

The positive outcome is seen as an improvement of the quality of the final decision of a land use plan. Also, it can be a helpful visualization tool enabling interfacing between experts and general public (Golobič 2005). This paper shows that landscape vulnerability modelling can be used for landscape sensitivity assessments within a landscape character assessment (LCA) of the National Park Krka. Considering its recognized character and the possible changes of its landscape, the inclusion of any additional values can increase the quality of management guidelines.

Introduction

Protection is a very important issue within development planning, incorporating many aspects such as nature, environment, heritage, and (in)directly landscape protection. Considering that landscape is a holistic system (Bell et al. 2012), it is unfeasible to process it directly (Chadwick 1971). The basic issue to solve is whether or not to accept proposal on the change. An approach to such spatial problem solving is regularly based on variety of standards and norms. Such generally accepted endeavours for protection, which must be included in the drafting of every planning document, according to Marušič (2010), represent the standardization approach. Moreover, Marušič (2010) pointed out the possible inadequacy of the standardization approach, specifically from the planning perspective which, in order to be genuine, should be based on optimization. The spatial planning itself should rest on finding the best possible solution, i.e. optimization of decision.

Beside the above mentioned, landscape protection should not solely be based on institutional and standardization premises. This is because many of its permanent and, even more; changing values and particularities can remain hidden. Landscape values and qualities can be standardized only if there is a prior agreement on values and an unconditional trust in the selection criteria (Golobič 2005). This is very rare and difficult to expect.

As we have already argued, the landscape qualities arising from expert and public aspirations should not remain hidden within any level of planning. Instead they must be considered in every step of the evaluation and decision making process. This research emphasizes the role and contribution of landscape modelling within that process.

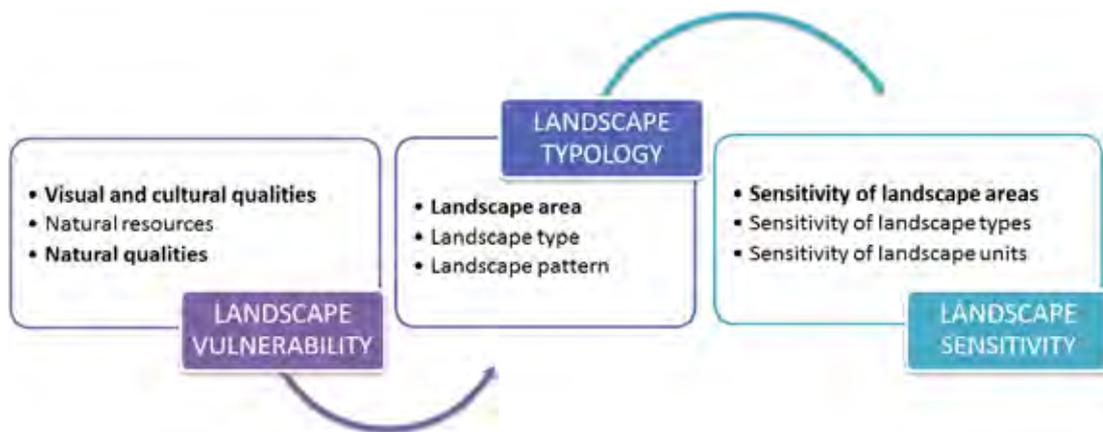


FIGURE 1. Methodological scheme of landscape modelling in LCA

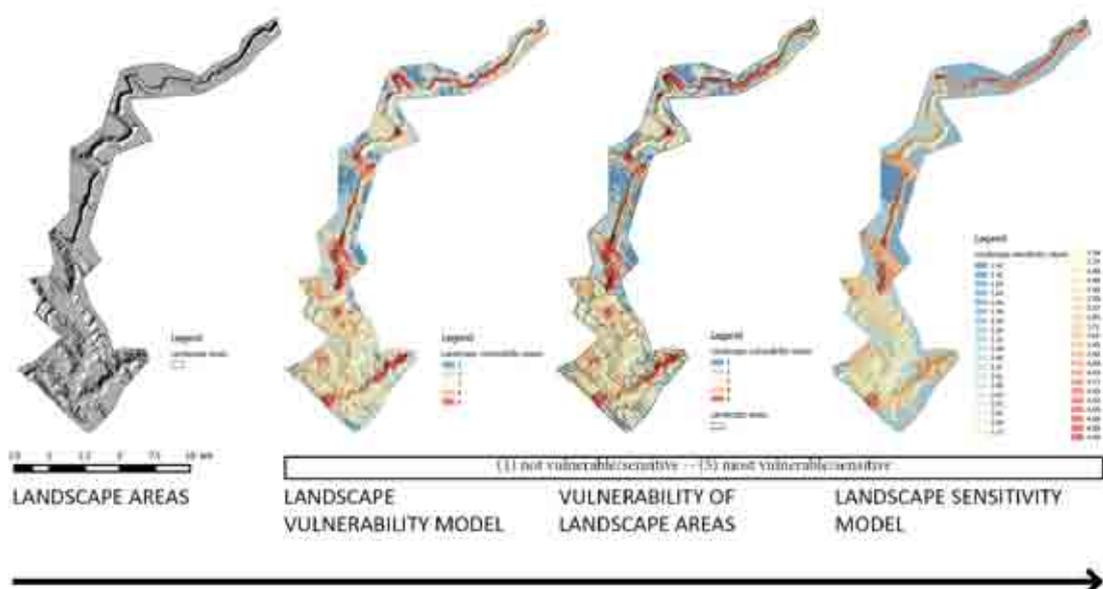


FIGURE 2. Evaluation models

Material and Methods

The first part of the research was based on an extensive literature review. This included different aspects of landscape modelling and evaluation, and possibilities for implementation. The second part, mainly presented in this paper, is aimed to test evaluation approaches in landscape modelling. This was carried out through the case study of the LCA of the National Park Krka in Croatia. The analysed LCA study was based on landscape modelling of vulnerability and landscape typology at the landscape area level (Figure 1). Although only the landscape area level was utilized, the same approach can be applied at any other level of landscape typology units; namely the landscape type and landscape pattern.

The main purpose of the landscape vulnerability assessment was to determine the different expert values of, and in the landscape. The criteria parameters were obtained through the overview and spatial data clustering, which was the source for

the modelling. The models included simulations of landscape qualities: natural, visual, and cultural. Spatial characteristics were presented as matrices through the evaluation of a certain spatial phenomena according to a predetermined scale. Modelling of the landscape vulnerability was made in GIS software (ProVal2000). Vector spatial data was evaluated through evaluation matrices, and raster spatial data was evaluated through buffer distances. The matrices obtained were overlapped using GIS arithmetic functions, which calculated the values of every spatial unit while considering the values of the input data. Also, by using the arithmetic functions for calculating final value, an extra weight can be assigned to a certain spatial attribute. It is important to emphasize that the results derived from this analysis are not all-purpose; they are obtained according to particular developmental needs and specific landscape values and potential.



FIGURE 3. Example of sensitivity evaluation of Babin grad and Manojlovac landscape areas.

Landscape sensitivity was obtained by digitally overlying predetermined landscape units with the landscape vulnerability model. The average vulnerability for every landscape unit was determined by using QuantumGIS software (Figure 2). In order to be taken into consideration for the planning of new management activities, all of the landscape units were classified according to the average vulnerability.

Results and Discussion

The research pointed out five very sensitive landscape areas; Babin grad, Manojlovac, Skradinski buk, Carigrad Bilušića buk and Roški slap. The latter three have already been recognized as significant, and are under very strict protection. In the analysis, the landscape areas Babin grad and Manojlovac (Figure 3) proved to be very vulnerable and sensitive to changes, although they have been recognized as sites of active protection and recreation.

By definition planning is oriented to the uncertain future, so it cannot fully be conceived until it becomes the present (p. 188, Chadwick 1971). Instead facing the inaccessible future, systems can be presented and analysed in the form of models. So, to best predict the future, the challenge in the modelling research is to define optimal level of simplification for certain planning purposes (Deming and Swaffield 2011). Modelling can also be used for the integration of different values into spatial planning and conservation. The knowledge on values is important for the enhancement of spatial and environmental planning and management. (Brown and Brabyn 2012)

In Croatia, modelling is used for landscape vulnerability assessments, which are carried out within strategic development planning, but also within environmental assessment procedures. Landscape sensitivity modelling is part of landscape character assessment (CA/SNH 2014), but LCA can also be based on landscape vulnerability assessment. The core benefit of using the landscape vulnerability assessment is the possibility to include all possible values, whether perceived by experts or the general public. Expert values represent sectoral views and they usually differ given the professional field of working. As such, they should easily be transformed into various criteria. In modelling process, values among different expert groups, and between experts and the general public can be treated and included equally, and then harmonized in planning process.

Conclusion

In this paper we pointed out that all spatial values and qualities, potentially perceived dissimilar by different social groups, can be incorporated into the landscape assessment through modelling process. The landscape character assessment represents the standardization approach itself, because it defines landscape units according to predefined experts' criteria. Even still, it is possible to embed various values and aspirations within the landscape sensitivity and to enable agreement among experts and between experts and general public.

In conclusion, LCA as a tool for direct protection and management of the landscape should not be solely based on predefined norms. Given the landscape is treated as a complex system in which development is assumed to be sustainable, the management guidelines should not result exclusively from set of norms. Furthermore, finding optimal solutions for every spatial problem or demand could be more difficult if based on standardization. Beside, landscape is considered as the best concept for implementation of measures for sustainable development (Benson and Roe 2005). Therefore, using landscape modelling as an optimization approach in the spatial planning process, the development needs of society can be harmonized with protection demands in order to achieve sustainable spatial development.

References

- Bell, S., Sarlöv Herlin, I., Stiles, R. 2012. Exploring the Boundaries of Landscape Architecture. Routledge. London & New York.
- Benson, J.F., Roe, M.H. (eds.) 2005. Landscape and Sustainability. Spon Press is an imprint of the Taylor & Francis Group. London and New York.
- Brown, G., Brabyn, L. 2012. An analysis of the relationships between multiple values and physical landscapes at a regional scale using public participation GIS and landscape character classification. *Landscape and Urban Planning*, 107: 317-331.
- Chadwick, G. 1971. A systems view of planning. Towards a theory of the urban and regional planning process. Pergamon press. Oxford.
- Countryside Agency and Scottish Natural Heritage (CA/SNH) 2014. Landscape Character Assessment: Guidance for England and Scotland. Topic paper 6: Techniques and Criteria for Judging Capacity and Sensitivity (author: Swanwick, C.), Source: <http://publications.naturalengland.org.uk/publication/5601625141936128>.
- Deming, M.E., Swaffield, S. 2011. Landscape Architecture Research; Inquiry, Strategy, Design. John Wiley and Sons. Hoboken, New Jersey.
- Golobič, M. 2005. Visualisation Methods as an Interface between Science and democracy in Spatial Planning, in Buhmann/Paar/Bishop/Lange (Eds.) Trends in Real-Time Landscape Visualization and Participation. 6th International Conference on Information Technologies in Landscape Architecture. Proceedings at Anhalt University of Applied Sciences 2005. Source: http://www.kolleg.loel.hs-anhalt.de/landschaftsinformatik/fileadmin/user_upload/_temp_/2005/2005_Beitraege/004/2005-004.pdf (March 29, 2016).
- Marušič, J. 2010. Landscape planning between standardisation and optimisation. *Landscape* 21. 2010. 41 – 45.
- Steinitz, C. 2011. On Scale and Complexity and the Need for Spatial Analysis. ESRI. ArcNews. Web source: <http://www.esri.com/news/arcnews/spring11/articles/on-scale-and-complexity-and-the-need-for-spatial-analysis.html> (March 30, 2016).

How Can Urban Designers Take Advantage of the Invisibilities when Designing Urban Environments with Local Citizens?

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place-making | co-design | prototyping | research methods |
design-anthropology | involvement

Through this paper, I wish to contribute to discussion by exploring how a design-anthropological and co-design approach not only collects material from the field and for later ideation when designing urban spaces, but also engages citizens involved in urban-design processes. I will argue that bridging the gap is the *translation* of the fieldwork, and of the local invisible connotations of urban spaces, into a powerful tool when involving citizens in urban design – simultaneously *consolidating* the mobilization and empowerment of citizens (in this case, young people) – in the design process.

A small-scale experimental research project in Denmark in 2015 aimed to investigate how co-design methods affected the involvement of citizens in urban planning. This established *the Urban Design Hub* with local stakeholders, young people and me, Laura Winge, as facilitating co-designer.

The project was a collaboration between the municipality of Gribskov, local citizens in Græsted, the Ministry of Housing and Rural Affairs, Co-design Research Centre (CODE) The Royal Danish Academy of Design KADK, and Ramboll (engineering, design and consultancy company). Græsted is a small dormitory town with 3500 inhabitants, two train stations, and a main street with empty shops. The aim of the process was to develop ‘urban spots and coherence’ by involving citizens and integrating people of different ages in the local community.

The Urban Design Hub was a physical space at the local library with 15 young people (aged 12–16 years) as the hosts, whom local stakeholders joined for discussions and development. *The Hub* consisted of co-design workshops, based on five-hour co-creations two to three days per week, from November to December 2015, in collaboration with the local school.

Co-creation is here defined as a participatory workshop addressing a theme in the urban development process. Co-design is understood as a user-participatory design process where citizens and stakeholders are involved in democratic design dialogues: defining the problems in the town and designing solutions or specific designs that address these. The design of urban spaces involves a dialogue with what already exists (Braae 2015). An anthropological understanding of the town, combined with a site-specific analysis of urban spaces, can be the driver when co-designing urban spaces.



FIGURE 1. Co-creation – dialogue – cultural probes



FIGURE 2. Modelling

The Hub was based on a relational atmosphere, using design-anthropological methods both to understand the present and to bridge the gap to the future, using the material collected for ideation and exploring possible future scenarios to access data: ‘ethnographies of the possible’ (Halse 2013).

But how can we bridge the gap, moving from understanding the present based on anthropological fieldwork to a praxis-based urban-design process? How can we bring insights – senses and local narratives – into the co-creations? And could the co-design process be an answer to engaging the young people who participated?

The co-design process revealed from the design-anthropological method ‘cultural probes’ which kickstarted the dialogues: the participants were bringing in samples from their everyday life, describing the urban sites and addressing local issues.

Broken Dreams as a Resource for Urban Design

Mobilizing and engaging young people in the urban-design process was an early gap: they simply did not believe they had an active role to play in developing the town. The city-development process started with local public meetings, but no young people came. CODE challenged the community by commenting on who was *not* present, suggesting how we could set up a design dialogue with young people.

Conversations during the later co-creations showed me that young people had stopped dreaming about spaces of possibility in the town, and did not believe they could influence or contribute to the city. One girl questioned her ability to participate in the design process very directly, asking why she should contribute to the development of the town when everything revolved around escaping it as soon as possible. Another girl questioned whether she was a citizen at all, commenting that she felt the public meetings were not for her, referring to the fact that she could not vote because she was ‘only’ a child (field notes).

The *translation* of local invisible connotations of urban spaces into the design of co-creations was another gap. Bridging the gap between the present understanding of spaces of possibility (or impossibility) and the design of spaces connected to (i.e. visions for) everyday life became a focus in the co-design process.

The co-creations were based on creating a community feeling around urban design. *The Hub* facilitated ongoing democratic design dialogues with local citizens and stakeholders on democratic design, based on co-creations, and exhibited visualizations and models of the suggested urban design. *The Hub* was designed as a citizenship process, understood as a social-design process. I saw it as sharing a community of time and process of ‘growing older together’ (Schutz 1962).

Design Methods in Urban Planning as Empowering Imagination

In the Urban Design Hub, we planned to make the future come alive by testing it with 1:1 prototypes – not simply describing or representing it, but providing real answers (Gatt & Ingold 2013).

The co-design process was based on cultural probes to negotiate (and design) the values, hopes and dreams of participants, who were asked to photograph their town, with the instruction: ‘Picture the best, the worst, and everyday life’. Through this anthropological design method, the collective invisibilities of the town became clear, so that a photograph entitled ‘The Spot Where the Swimming Baths Never Came’ became ‘Landscape of Broken Promises’. As narratives, the broken dreams became physical through the material: a collection of participants’ interpretation of local history. Stories about promises broken by the municipality told not only of disappointed children, but also of young people’s belief that influence and citizenship were for grown-ups. I witnessed how landscapes can have invisible local



FIGURE 3. Meeting with municipality



FIGURE 4. Building prototype

narratives as connotations – that is, the insight that non-visible traces can overshadow potentials (Halse, Brandt, Brendon & Binder 2010).

The photographs were turned into collages that visualized new ideas for urban spaces, and became a catalogue of future urban-design stories. A revitalization of the local park, local events for young people and a children-lead café. The ideas were qualified through negotiations in *the Hub* and translated into mock-ups exhibited at the library, encouraging dialogue with the local community. These ‘ethnographies of the possible’ (Halse 2013) represented a collective interpretation of the findings – a collaborative decision-making process in *the Hub*, designed as a mutual learning situation (Whyte 1979). Bridging the gap by creating *the Hub* also aimed to deepen relationships among former strangers with an investment of time (ibid.). By supporting collaboration with young people – encouraging a feeling of community, going from ‘I’ to being a part of a group – the Hub became a ‘we-project’.

The engagement in co-creation was a direct reaction to the co-design process. Narratives of past and present not only translated into future possibilities, but also engaged participants, encouraging them to believe in their role. For example, when a stakeholder from the municipality visited in order to budget for the later full-size prototyping of the café, the participants were nervous because it felt risky to share their ideas, but the municipality agreed to finance the full-size prototyping. But when the participants later presented their results to the Danish Prime Minister, all nerves were gone, and they were confident and proud of their projects.

Full-size prototyping was the physical manifestation of their interpretation and negotiation of their dreams for the community, so bridging the gap between description and real

application to local society. The focus was on moving forward in line with desires and aspirations, rather than looking back on what was missing, and on the failures of the past (Gatt & Ingold 2013).

The Hub investigated how young people can contribute to urban design, and encouraged the design of new hope. Bridging the gap going from the narrative of ‘nothing is possible’ to empowering local ideas represented a new beginning for the participants. The gap was bridged when their imagined projects were translated into full-size living prototypes – the coming-together of ambitions with materials in real, everyday life (Gatt & Ingold 2013).

Conclusion

Emerging urban spaces provide an opportunity to involve young people as active co-producers of expressions and experiences of cultural heritage. It is possible to engage young people by building a bridge between the understanding of the present use of urban environments and the design of future urban spaces. I see a space of possibility in the *translation* of locational identity into full-size prototyping. The *translation* of fieldwork into design, and the *consolidation* of young people’s engagement, are now part of new narratives in the town: prototyping takes place in real life, contributing to urban space, as living proof that participation matters.

This learning outcome of the research project will be the basis for my PhD project, starting in 2016 and involving young people in co-designing playable urban spaces, through case studies in a regeneration area of Copenhagen. My PhD project will investigate how children’s interpretation of their local spaces, as a context with inscribed meanings, can serve as a tool in the design process. Co-design methods can bridge the gap between present and future – and between citizens and

regeneration plans – by addressing socio-cultural relations, experiences, identities and local values (Otto & Smith 2013). We will not only listen to the local narratives, but also base the prototyping on them, by asking: how would a child-designed city look? How can future urban spaces for children support playability, when children become involved as their co-designers?

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References

- Braae, E., *Beauty Redeemed – Recycling post-industrial landscapes*. 2015. Ikaros Press and Ellen Braae, Risskov and Arkitektens Forlag, Copenhagen, 13–14.
- DiSalvo, C., (2009) 'Design and the Construction of Public'. *Design Issues*.
- Halse, J. *Between Design and Anthropology: Improvising Embodied Interaction*. D.A.: A Transdisciplinary Handbook of Design Anthropology. Frankfurt am Main : Peter Lang Verlagsgruppe, 2013.
- Halse, J., Brandt, E., Brendon, C., Binder, T., Eds. *Rehearsing the future*, Danish Design School Press, 2010.
- Huybrecht, L., Researcher ArcK research group, Faculty of Architecture and Arts, University of Hasselt, Belgium. *Future Fictions Godscheide*. Talk Jun. 10 2015. Codesign Research Centre, KADK.
- Ingold, T. and C. Gatt 2013. From description to correspondence: Anthropology in real time. In *Design Anthropology: Theory and Practice*, eds. W. Gunn, T. Otto and R. Charlotte-Smith. London: Bloomsbury, pp. 139-158.
- Kwon, M., 2004. *One place after another, site-specific art and locational identity*. The MIT Press, Cambridge.
- Otto, T. and Smith, C.R., 2013. *Design Anthropology: A Distinct Style of Knowing*. In: Ed. Gunn, W., Otto, T. and Smith, R. C., *Design Anthropology, theory and practice*. 2013. Bloomsbury Academic, Bloomsbury Publishing Plc. 1–33.
- Schutz, A., 1962. *The Problem of Social Reality*, collected papers I, ed. Nathanson, M., The Hague: Nijhoff. In: Halse, J., Brandt, E., Binder, T., Olander, S., Ed. (2014) *Democratic Design Experiments Codesign Programme*, Danish Design School Press.
- William F. Whyte, 1979, On making the most of Participant Observation, *The American Sociologist*, 14 (1), Feb. 1979, pp. 56-66.

Bringing Landscape Visualization Tools to Practice: Prerequisites for Successful Development Approaches

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visualization tools | planning practice | collaborative development |
prototyping | iterative approaches

Informing landscape planning and design with environmental science is mandatory for securing landscape qualities in the long term. To this end, visualization products can offer powerful means. However, visualization tools appropriate for practice need not only suit the particular planning tasks but also be credible and legitimate to the intended audience. We demonstrate three examples of how visualization tools for different planning issues were developed in collaboration with practice partners, and discuss insights about prerequisites for successful development. Expedient are a joint development of prototypes with practice partners. An implementation of demonstrators can raise the practitioners' awareness and demand for integrating such tools into local planning processes. Targeted training on ethical, technical, and processual aspects is required to transfer the knowledge of state-of-the-art visualization tool development into practice.

1. Introduction

To bridge the gap between environmental science and policy for securing landscape qualities in the long term, is a need that has been called for some time now. Still implementation fails at the scale of local communities where landscape changes actually occur (Opdam et al. 2013). To overcome this shortcoming, more collaborative planning and design approaches are regarded essential. Furthermore, tools supporting the integration of diverse disciplinary and local knowledge as well as social learning at the local landscape scale shall foster developing a shared vision and finding acceptable and effective solutions to adapt the landscape to future needs (Opdam et al. 2013; Opdam et al. 2015). Visualization tools prove useful for supporting a better understanding of planning issues and collaborative processes (Wissen Hayek 2011). However, the visualization products need not only suit the particular planning tasks but also be credible and legitimate to the intended audience (Lovett et al. 2015; Wissen Hayek et al. 2015). In this paper we demonstrate examples from three studies of how such visualization products can be achieved and discuss our insights about prerequisites for successful development of visualization tools.

2. Development of Visualisation Tools - Insights from Three Examples

We show how visualization tools for three different planning issues were developed in collaboration with practice partners. The issues were (1) the designation of watercourse corridors, (2) the prevention of invasive, non-resident plants' (neophytes) distribution, and (3) the planning of wind energy infrastructure. We briefly present the planning contexts, describe the visualization tools' development, and point out the insights discovered with regard to their successful development.



Figure 1: Example of available information in the web-based visualization platform to help in watercourse corridor assignment (left); result of the final visualization approach for neophytes' spreading patterns on the example of Himalayan Balsam (*Impatiens glandulifera*) (middle); interior view of the mobile VisAsim-demonstrator for presenting visual-acoustic simulations of wind parks to the public (right).

A web-based visualization platform was developed to help municipalities of the Canton of Zurich, Switzerland, in collaboratively assigning adequate corridors along watercourses according to the revised Swiss Waters Protection Act (Wissen Hayek et al. 2015). The intended purpose of the platform was to support discussion and balance diverse practice partners' conflicting land use interests in the watercourse corridor areas by providing information on flood protection as well as on ecological and socio-economic aspects. A preliminary as well as an enhanced version of the platform were developed and demonstrated to different partners for evaluating its readiness for practice. The practice partners needed these concrete examples to express their specific demands regarding the tool's functionality and contents. This prototyping approach enabled defining functions and contents which are actually required at the final version, which are now strongly linked to further guidelines for assigning the watercourse areas (Figure 1, left).

The second tool was developed for visualizing the effect of spreading neophytes on the landscape appearance. In order to prevent and combat spreading neophytes the Canton of Zurich has defined measures in the Action Plan 2014-2017 "Invasive Non-Resident Organisms". The purpose of the visualizations was to illustrate the effects of the measures on municipality level. A GIS-based visualization approach was developed that integrates expert knowledge of neophytes' spreading patterns at specific locations for a period of 20 years. This resulted in highly detailed, rather realistic visualizations. These were presented to experts from the cantonal authority on biosecurity and alien species. They tested them for their applicability as information medium in the office and in the field. The visualizations were sufficient for presentation on a screen. However, in the field the experts had difficulties to orientate themselves in the visualizations as the represented landscape section was very different from the human field of view. Furthermore, existing landscape elements were lacking detail, and the approach's cost-effectiveness was not sufficient. Based on this feedback the prototype of an alternative visualization workflow was developed, which met all practice requirements (Figure 1, middle). The practice partners now strive for its practical implementation.

The third tool is a GIS-based visual-acoustic simulation of wind parks (VisAsim) for public information and evaluation (Manyoky et al. 2014). A key problem in the planning of

wind farms is the public acceptance. People living near a site of a proposed wind park would like to receive more detailed information, particularly about the visual impact and the noise generated by the wind turbines. VisAsim shall provide an opportunity for those people to experience future projects. The concept of VisAsim was defined with practice partners, followed by a team of scientists who generated a prototype simulation of an existing wind park. The prototype's suitability for visual and acoustic assessment of the landscape impact was validated by comparing it with recordings of the real wind park. The scientists then presented the validated prototype to practice partners, who agreed with testing its applicability. The scientists developed simulation prototypes of generic landscapes and demonstrated their applicability in an acceptability study. Based on the study results, the practice partners developed ideas for further utilization of the simulations and suggested creating a VisAsim-demonstrator. This was done in the scope of a travelling exhibition on wind energy. The demonstrator (Figure 1, right) awakened broad interest in a practical implementation of VisAsim not only by authorities and wind park developers, but also by the general public.

3. Discussions and Conclusions

The presented examples of three development processes suggest that bringing visualization tools to practice requires an iterative prototyping approach with a strong collaboration of technicians, science and practice partners. We recognized that the practice partners needed concrete examples of the visualization tool to express their specific demands with regard to the tool's functionality and contents as well as the cost effectiveness of the visualization approaches. Furthermore, demonstrating a possible application of these prototypes to planning experts and the broader public can support awareness rising and interest for integrating the tool into local planning processes. Overall, the iterative processes of conceptualizing the tools in strong collaboration with practice partners increased relevance and legitimacy of the tools.

The knowledge of state-of-the-art visualization approaches needs to be integrated into training courses on visualization tools for landscape planning and design. These should not only focus on technical visualization aspects, such as the training of visualization software, or on perceptual effects of the visualization tools due to the chosen level of detail, interactivity, and other characteristics. But also on imparting knowledge

of sound approaches for relevant, credible, and legitimate visualization tools which are equally important, if not even more so. Therefore, the courses should comprise lectures on (1) ethical visualization aspects, (2) practical training exercises implementing 3D modelling applications, and (3) on processual tool development aspects. With regard to these three aspects, the insights gained so far need to be compiled and made accessible in consolidated form, in order to support developing visualization tools that actually fit into planning practice.

References

- Grêt-Regamey, A., Burlando, P., Girot, C., Lin, E.S., Shaad, K., Vollmer, D., 2014. Digital Methods and Collaborative Platforms for Informing Design Values with Science. In: U. Wissen Hayek, P. Fricker and E. Buhmann, eds., Peer reviewed proceedings of Digital Landscape Architecture 2014 at ETH Zurich, Zurich 21-23 May 2014. Berlin: Wichmann, 46-46.
- Lovett, A., Appleton, K., Warren-Kretzschmar, B., von Haaren, C., 2015. Using 3D visualization methods in landscape planning: An evaluation of options and practical issues. *Landscape and Urban Planning*, 142, 85-94. doi:10.1016/j.landurbplan.2015.02.021.
- Manyoky, M., Wissen Hayek, U., Heutschi, K., Pieren, R., Grêt-Regamey, A., 2014. Developing a GIS-Based Visual-Acoustic 3D Simulation for Wind Farm Assessment. *ISPRS International Journal of Geo-Information*, 3, 1: 29-48. doi:10.3390/ijgi3010029.
- Opdam, P., Nassauer, J.I., Wang, Z., Albert, C., Bentrup, G., Castella, J.-C., McAlpine, C., Liu, J., Sheppard, S., Swaffield, S., 2013. Science for action at the local landscape scale. *Landscape Ecology*, 28, 1439-1445. doi: 10.1007/s10980-013-9925-6.
- Opdam, P., Albert, C., Fürst, C., Grêt-Regamey, A., Kleemann, J., Parker, D., La Rosa, D., Schmidt, K., Villamor, G.B., Walz, A., 2015. Ecosystem services for connecting actors – lessons from a symposium. *Change Adaptation Socioecol. Syst.*, 2: 1–7. doi:10.1515/cass-2015-0001.
- Wissen Hayek, U., 2011. Which is the appropriate 3D visualization type for participatory landscape planning workshops? A portfolio of their effectiveness. *Environment and Planning B*, 38: 921-939. doi:10.1068/b36113.
- Wissen Hayek, U., Teich, M., Klein, T.M., Grêt-Regamey, A., 2015. Bringing ecosystem services indicators into spatial planning practice: Lessons from collaborative development of a web-based visualization platform. *Ecological Indicators*, Special Issue on “Developing and Applying Ecosystem Services Indicators in Decision-Support at Various Scales”, 61, 90-99. doi:10.1016/j.ecolind.2015.03.035.

Planning and Design of Urban Green Networks in Stockholm

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graph theory | least-cost-path | species indicators | structural connections

Landscape fragmentation threatens habitat movements, biodiversity and other ecosystem services. To tackle this issue, network analysis based on graph theory has been established as an efficient method. This paper aims at setting a social-ecological network model for the issue of landscape or habitat fragmentation. Graph theory combined with sociotope and biotope maps are introduced to simply visualize network situation through two dimensional maps. The European Crested tit (*Lophophanes cristatus*), European common toad (*Bufo bufo*) and humans, are selected as three species indicators, together with slope, human disturbance and land use maps, to decide the travelling cost from node to node. Least-cost-path analysis is used to create an ideal reference map of green networks. By testing the framework in Stockholm, Sweden, two aspects of network improvement strategies can be addressed. Potential improvement strategies are then introduced at city and local scale. The results show three separate network maps as basic references, and one comprehensive plan for city planners in the future. Then at local scale, two potential improvement routes would be indicated accordingly.

Introduction

Habitat fragmentation is a big threat as a result of land use changes in urbanized areas, harmful consequences of this include biodiversity loss and decline of ecosystem services (Adriaensen et al.). In an attempt to tackle the issue of landscape and habitat fragmentation, landscape connectivity is regarded as a suitable approach from an ecological (Cook Van Lier 1994) and social perspective (Teng et al. 2011). In order to visualize the structural configuration of landscape elements, graph theory is used, which is the graph application through mathematical algorithm, introduced by Bunn et al. (2000). Two indispensable elements of graph theory in representing landscape are nodes and links that can be analogized with the habitats and dispersal in between (Zetterberg et al. 2010).

In this paper, the concept of 'green networks' is used as a concrete analytical framework for studying green and blue linkages, as well as social and ecological connections and integrations. We selected Stockholm, capital city of Sweden and green capital of Europe 2010, as an example to test the framework and provide improvement suggestions for current city plans. The main research questions of this paper are: how can the green network concept provide a comprehensive framework for analysing landscape and habitat fragmentation, and how can it benefit the planning and design of current green-blue spaces within the city.

Variable	Attribute	Crested tit		Common toad		Human	
		Costs	Weight	Costs	Weight	Costs	Weight
Land cover (C _l)	Agriculture	50	0.5	100	0.4	7	0.7
	Coniferous/mixed forest	1		1		9	
	Deciduous forest	10		10		8	
	Other open land ^{*1}	400		3,000		1	
	Water	1,000		10,000		10	
	Closed construction ^{*2}	300		7,000		6	
	Low building	200		1,000		3	
	High building	500		8,500		4	
	Recreational building	600		7,500		2	
	Industrial area	800		8,000		5	
Human disturbance (C _d)	<20 people/ha	1	0.4	1	0.4	1	0.15
	20-40	10		150		2	
	41-60	20		300		4	
	61-90	45		500		6	
	91-120	70		700		8	
	121-180	85		900		9	
	>180	100		1000		10	
Slope (C _s)	0-10m	1	0.1	1	0.2	1	0.15
	11-20	30		300		3	
	21-30	50		500		5	
	31-45	70		700		7	
	45-60	90		900		9	
	60-90	100		1000		10	

TABLE 1. Costs and weights for land cover, human disturbance and slope variables used in the model of green networks in Stockholm.

Method

This paper first searched for crucial habitats of green-blue spaces in Stockholm that are most worthy to protect. In order to propose improvement suggestions for these current situations, a map of ideal network connections was necessary. So the second step was to calculate the effective linkages among the selected habitats. Least-cost-path analysis tool in GIS was then applied using the relative and theoretical number of travelling cost. Based on an optimal corridor map, concrete suggestions of planning and design would be proposed correspondingly.

European crested tit (*Lophophanes cristatus*), European common toad (*Bufo Bufo*) and human being were selected as three species indicators, as referred in the reports of Landscape Ecology Analysis by City of Stockholm. Habitat selection, source habitats (valuable habitats) and determining cost values were based on overlaying two reference maps (biotope and sociotope maps) as well as analysis of scientific literature and local expert assessment. Higher numbers represent high cost of travelling and low suitability for dispersal of organisms. In this study we considered the following factors: land cover (C_l), human disturbance (C_d) and topography slope (C_s) (Table 1). Land cover (C_l) for the three indicator species was estimated in accordance with different land use type (from built areas to forested lands). Human disturbance (C_d) assumes that anthropogenic impedance directly relates to human density and activity. Slope (C_s) is an important factor in crossing,

indicating the relative costs of a terrain's surface represented by DEM (Digital Elevation Model). Transferring between cities to local scale, detailed recommendation were analysed using line density tool. Setting current land use and path density maps as background, an augment plan of green networks could be addressed afterwards.

Results

Based on sociotope and biotope maps which contain the actively recreational and ecological habitat locations of residents and wildlife, a crucial habitat map structure within Stockholm can be identified. According to three species, three separate maps of effective linkages among these habitats are computed. Every map includes 1711 paths, indicating the optimal corridors with highest facilitation and lowest resistance. However for generating a holistic map for three species and their pointing birds and amphibian groups, it is problematic to just merge the three separate ideal maps. And for some paths are shared by three maps together, which would mean they have more important values. Hence we identify path density through the line density tool in ArcGIS and analyses their relative potential utility for a comprehensive map. Higher density levels demarcate high performance and value of potential movement in practical planning and design. In Figure 1 high and medium level density of effective corridors are shown. These areas are going to be crucial dispersal links for wildlife and humans, as these will help more effectively in connecting different parts of

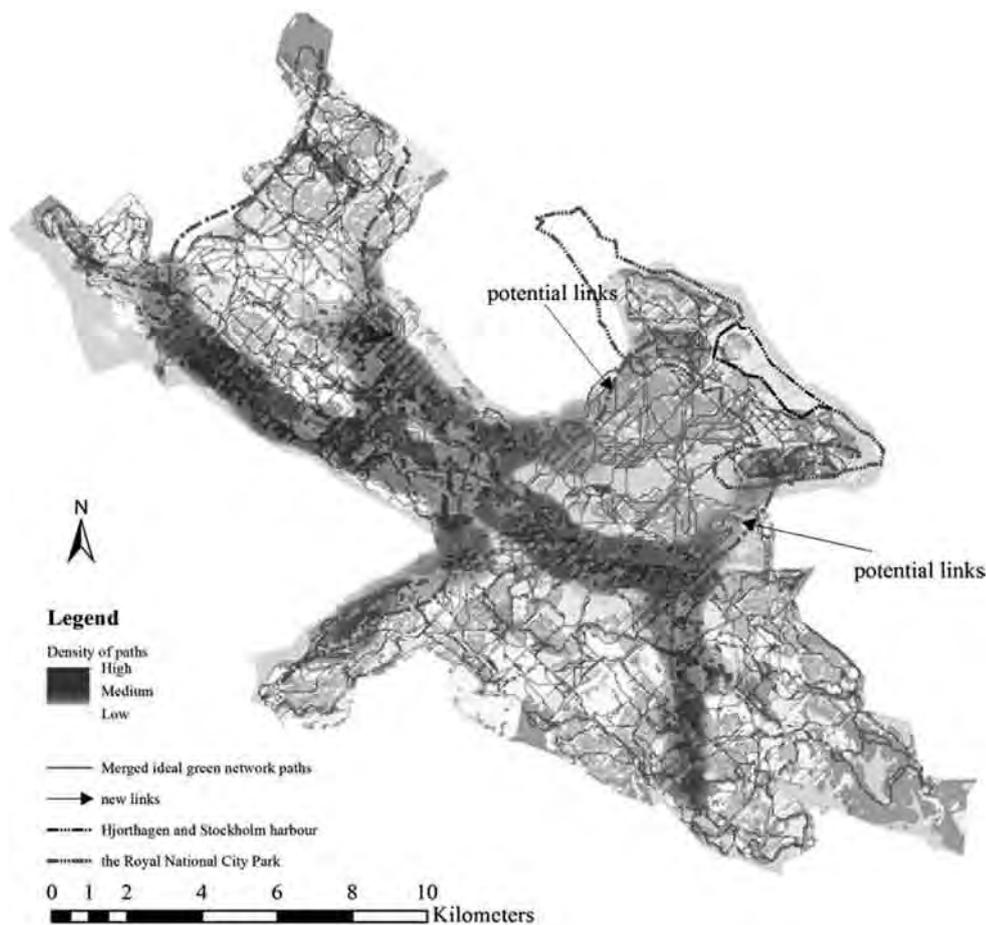


FIGURE 1. Comprehensive green network with density of paths in Stockholm. The more dense the path areas, the higher priority these should be given in urban planning.

Stockholm. It is clear to see that ideal paths of the highest value link the Royal National City Park in the north-eastern part with north-western and southern part of the city.

Zoom in to a selected neighbourhood in Hjorthagen, rerun the LCP analysis, we could offer a suggestion for potential improvement of the local green network. These three locations of ideal paths-corridors can tie together green-blue spaces with developed areas. The length of offered corridors varies from 196 to 566 meters. They incorporate different wildlife habitats and water bodies and should be prioritized by municipal planners.

Discussion

Graph theory has proven to be a valid method into green-blue spaces planning. Its network analysis framework in combination with the corresponding spatial extents of the city can offer an integral approach to planning. One of the major issues of the visualizing network approach in green-blue space planning is choosing nodes. Nodes can then be the habitat patches in the green space layers that provide important functions for wildlife living and reproduction, or they can be fragile patches that need to be protected and preserved in front of urban densification and city's development. Selection of nodes also concerns network users for which species are proposed to use the graphic network. It relates to species indicators as a result of different criteria, such as focal species, umbrella or endangered species, and so forth. Apart from nodes selection, the LCP analysis

needs another layer, namely that of the cost raster. Knappen (1992) proposed using the number to decide the cost of values response to patch accessibility based on simulated dispersers. Some researchers have applied a similar way of simplifying the decision of cost values with different variables (Teng et al. 2011). A variety of factors can affect the dedicated cost values, such as land use, vegetation cover, human activities, elevation, etc. The more elements considered the more accurate or comprehensive cost values can be reached. Setting cost through the LCP model is not only a valuable way to consider ecological and social aspects but also integrates economic feasibility into sustainable green-blue space planning.

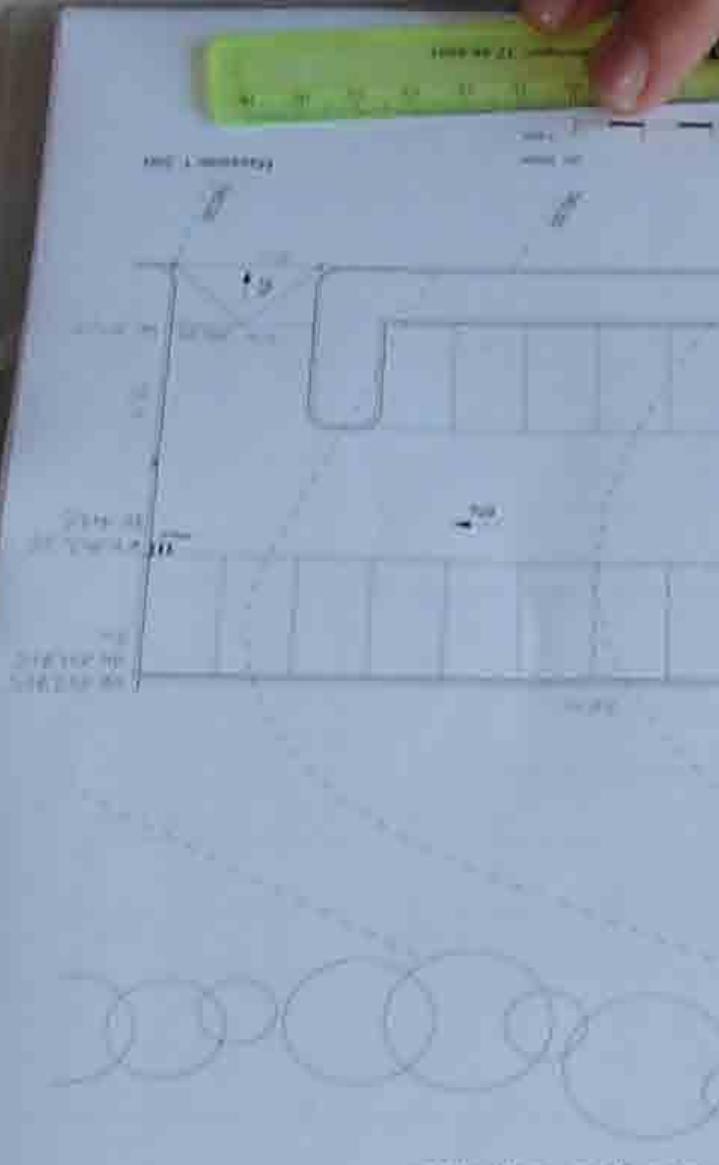
Conclusion

In future research we will apply the framework in more cities to check its operation ability and adjustment possibility. Additionally optimizing the analysing tool never ends, so as to green network framework and the LCP model. Crucial steps in the model – nodes and species selection, cost distance and LCP analysis – can still be optimized further. Different criteria of habitat and network users' selection will definitely lead to distinguished potential corridors and improvement strategies. But zooming in and out between scales would be a major advantage in discussing the planning and design of green network.

References

- Adriaensen, F., Chardon, J. P., De Blust, G., Swinnen, E., Villalba, S., Gulinck, H., and Matthysen, E., 2003. The application of 'least-cost' modelling as a functional landscape model. *Landscape and Urban Planning*, 64(4), 233-247.
- Bunn, A. G., Urban, D. L., Keitt, T., 2000. Landscape connectivity: a conservation application of graph theory, *Journal of environmental management* 59(4), 265-278.
- Cook, E. and Van Lier, H. N., 1994. *Landscape planning and ecological networks* (Vol. 6): Elsevier Science Ltd.
- Knappen, J., 1992. Changing the appearance of math. *EuroTEX*, 92, 212-216.
- Teng, M. J., Wu, C. G., Zhou, Z. X., Lord, E., and Zheng, Z. M., 2011. Multipurpose greenway planning for changing cities: A framework integrating priorities and a least-cost path model. *Landscape and Urban Planning*, 103(1), 1-14.
- Zetterberg, A., Mörtberg, U. M., and Balfors, B., 2010. Making graph theory operational for landscape ecological assessments, planning, and design. *Landscape and Urban Planning*, 95(4), 181-191.

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Es soll, dass das Oberflächenwasser der versiegelten
Gelände, Es darf kein Wasser vom umliegenden Gelände
auf die öffentliche Straße gelangen.
Trennung von 15cm Höhe.

Construction/IT

CONSTRUCTION/IT

SIMON COLWILL

**Time, Design and Construction: Learning
from Change to Built Landscapes Over Time.**
397

SIMON COLWILL

**Digital Communication of Knowledge for
Academic Design-Build Initiatives**
401

ULRICH KIAS

**Scale Matters, but Often Size is Meant !
A Critical Interjection About Scales**
405

JOSÉ MIGUEL LAMEIRAS, PAULO FARINHA-MARQUES

**Design Analysis and Validation of Digital
Terrain Models**
409

ISABEL MARTINHO DA SILVA

**Teaching Materials and Construction @
University of Porto**
413

JAMES A. ROYCE

**Integrating Cross-Discipline Collaboration
into Landscape Architectural Curricula**
417

ROBERTO ROVIRA

**Constructing Identity:
Lessons from the Sky Lounge**
421

ANNA-MARIA VISSILIA, JULIA GEORGI

**Teaching Landscape: Effective Exercises in
Landscape Detailing as Poetic Construction**
425

DANIEL WINTERBOTTOM

**Teaching the Craft of Landscape
Architecture: A Design/Build Approach**
429

DANIEL WINTERBOTTOM, STANKO STERGARŠEK,

IVA RECHNER DIKA

**Forging Innovative International
Partnerships: A Design/Build Collaboration,
Universities of Washington and Zagreb**
433

Time, Design and Construction: Learning from Change to Built Landscapes Over Time.

SIMON COLWILL Technical University Berlin, Germany

landscape construction | time | multi-temporal analysis |
vulnerability | weak points

This paper discusses landscape construction teaching methods and a research project at the TU-Berlin focusing on change to built landscapes through time. The research is based on the hypothesis that it is possible to optimise design, detailing, construction and maintenance techniques by monitoring and evaluating projects at regular intervals after completion. The processes of change highlight deficiencies in detailing, construction and maintenance. The research project is developing a non-destructive monitoring method to "read" these traces of time and pinpoint frequently occurring points of weakness. A low-threshold anticipatory method will then be developed for use during the design and detailing project phase to optimise future landscape projects in terms of their durability and resilience. The construction teaching methods evolving from this research involve the students in on site analysis and evaluations of built elements. Students examine the root causes of change and reflect on interrelations between design, building materials, technical implementation, maintenance and the processes of context-related change over time. These learning techniques enable integrative learning within the fields of landscape design, urbanism, sociology of space, climatology, construction and maintenance.

Through preparing construction seminars at the TU Berlin many landscape projects in and around the city were periodically studied and recorded. These experiences highlighted the diverse processes of change, and the alarming rate at which they occur. This developed into a DFG funded research project as well as construction teaching techniques which focus on this topic.

The research project entitled "Landscape architecture and the time factor: Construction research on the contextual change of built landscape elements and the development of optimisation strategies" is developing a low-threshold and non-destructive monitoring method for identifying frequently occurring points of weakness and patterns of change through field research. Where the causes are not visible or ambiguous, conventional inspection techniques using technical apparatus and scientific analysis are necessary. "Change" refers to the development of characteristic patina which, when unabated, leads to the destructive processes of decay. Points of weakness are areas that due to their design, construction or particularly exposed position are subject to greater levels of stress. Consequently these are more frequently and rapidly subject to detrimental change than other areas.

The main research goals are to:

- Develop a non-destructive field research method for monitoring built landscapes over time
- Identify and analyse the key causes of change
- Develop an optimisation strategy for landscape details
- Define a method for forecasting change
- Disseminate the research findings to practitioners



FIGURE 1. Examples of change to landscape details over time



FIGURE 2. Change to wooden bench in full shade under a tree canopy over 7 years. Above: Year of completion and 1 year later. Below: 7 years after completion.

In order to obtain uniform and comparable research results in terms of climate, culture and contextual conditions, and to achieve the required design, material and constructional bandwidth, the research focuses upon landscape details (e.g. steps, paths, drainage elements, tree grids, seating and walls) in public or semi-public open spaces in Berlin built between 1990 and 2015. Since reunification, a large number of typologically different projects have been planned and implemented. The current often desolate state of many of these projects reflects the reduced resources of the city, a fact that increasingly applies to cities throughout Europe (BMUB 2015, p. 12, 33, 74).

The processes of change are diverse and interrelated; the following key causes for change have been established:

- Contextual factors: e.g. level of exposure, access and circulation, social environment.
- Design and detailing deficiencies: e.g. form, choice of construction, serviceability, competencies of staff.
- Material deficiencies: e.g. suitability of material for the function and location, material quality.
- Implementation deficiencies: e.g. quality of implementation, construction management, competencies of staff.
- Maintenance and repair deficiencies: e.g. too intensive, extensive or incorrect maintenance, competencies of staff and site management.
- Ageing processes/time: e.g. climate and weathering, cultural change.
- User actions: e.g. intensity of use or misuse by people and/or animals.
- Force majeure: e.g. flooding, fire, storm, riot, strike, natural disaster (cf. Kirkwood 1999, 166-177).

In order to react to these diverse processes of change landscape architects need to continue being involved in developing their built works after completion. Contextual factors and ageing processes remain unpredictable factors that need to be thoroughly deliberated during design and detailing. A major cause of accelerated ageing is financial restraints, resulting in a reduction of specification quality as well as construction, maintenance and repair deficiencies. Change

due to human actions throughout the project cycle (e.g. competences of designers, consultants and project managers; skills of construction and maintenance staff; user intensity and behaviour) can be reduced through improved vocational education, continued staff training and improved working practices.

Landscape projects were ideally recorded from their year of completion; subsequent recordings were made each following year. Recordings were also made from older projects which can be evaluated with the aid of reference images from comparable details. To allow for a detailed holistic analysis, the photographic images were taken at three different levels of observation; images showing contextual and spatial interrelationships, images depicting the individual elements, and detailed images zooming in on surfaces. To date, ca. 75,000 photographic detail recordings have been made from ca. 180 projects. The recordings are currently being labelled (e.g. title, location, date, completion date), assigned extensive metadata for the subsequent detailed analysis (context, description, classification, analysis etc.), and stored in a database. The metadata structure has been developed through extensive literature research, comparisons with criteria for international standards, and personal observations.

The database enables a quantitative screening process for the comprehensive data, frequently occurring change and points of weakness can be identified and selected as case studies. Through comparisons between the original state and successive recordings, process-dependent changes become visible. Wettstein (2009: 87-142) defines various discrepancies in project goals, expectations and assessment criteria between landscape architects, construction firms and clients based on interviews with practitioners. We are therefore developing a rigorous qualitative evaluation system based on expert interviews with differing stakeholders and material specialists. An optimisation strategy will then be developed to mitigate weakness and detrimental change.

The research results will form a catalogue of change processes that can be used during the design phase of future projects to forecast change and detect points of weakness by analogy.

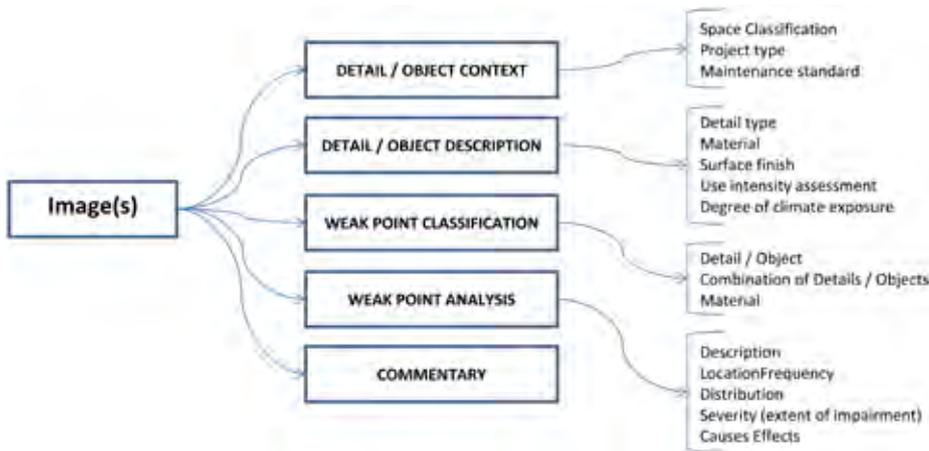


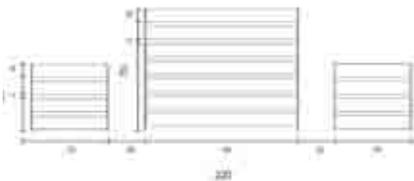
FIGURE 3. Metadata structure for the evaluation database.

KRITIK BAUELEMENT HOLZTISCH

WAS DIESES ELEMENT INNOVATIV MACHT:



- Nachhaltiges Bauelement aus Holz (Kiefer oder Fichte, leider nicht mehr zu erkennen) und Metall
- Element passt sich mit seiner länglichen Form perfekt dem Park an
- integriert sich perfekt in seine Umgebung



Prinzipschnitt (alle Maße in cm)

POSITIVE EIGENSCHAFTEN DES BAUELEMENTES:



- gern genutzter Aufenthaltsort (Versammlungsort, Picknickort, Treffpunkt)
- längliche Holzbalken könnten schnell und leicht gereinigt oder ausgewechselt werden
- Holz ist angenehm als Sitzuntergrund bei warmer und kalter Außentemperatur
- Die Holzauflage ist Nachhaltig (muss aber alle 10 Jahre ausgewechselt werden), der Rahmen aus Metall sehr beständig
- gerade, längliche Form ermöglicht viel Platz für viele Menschen
- Trittgitter unter den Bänken und dem Tisch verhindern das sich Mulden (durch Bewegung der Füße) im Boden bilden

NEGATIVE EIGENSCHAFTEN DES BAUELEMENTES:

- starker Vandalismus zu erkennen (Graffiti, Beschädigung durch Holzbalkenentnahme oder Feuer)
- Quell- und Schwindverhalten des Holzes
- Entstehung von Risse und Haarrisse können zu größeren Splittler führen
- Anfällig auf Pilze, Moose und Insekten
- Unkrautbewuchs unter der Bank und dem Tisch



Holzbalkenentnahme



Brandlöcher und Vandalismus am Holzbalken
Maria Girod (323889)

FIGURE 4. Excerpt from student field research submission. Girod, M. (2015)

However, due to specific climate and cultural factors the results are not directly transferable to other regions.

"Learning is the process whereby knowledge is created through the transformation of experience" (Kolb 1984, p. 38)

The research project is running hand in hand with teaching, allowing students to focus on the core themes of the investigation (e.g. climate and construction, points of weakness, use and misuse) through seminars, workshops and thesis topics.

Many students initially have a "false" image of built landscape which is propagated by images in landscape architecture publications that frequently portray "perfect" projects with flawless materials, taken at the time of completion. The onsite reality check for students a few months, or years later is often disheartening. Teaching methods developing from this research help to counterbalance this by involving Students in onsite surveys, analysis and evaluations of "real" projects after completion. Students experience built landscape as a dynamic evolving system interacting with the natural environment and

patterns of use. The teaching methods follow Kolb's (1984) "Experiential Learning Cycle" model of learning involving four elements: concrete experience (experience/do), reflective observation (review/discuss), abstract conceptualisation (learn) and testing in new situations (plan/apply). For example, a major assignment within our construction seminar for masters students involves students in small groups analysing landscape projects onsite before formulating a response. The assignment is set as a research question, the object of research being "real" landscape projects. Students examine the current condition in relation to the surrounding context and reflect on interrelations between design, building materials, technical implementation, maintenance and the processes of change over time. Comparisons with images in publications at the time of completion, together with project descriptions or reviews enable the students to identify time bound changes to the built landscape, as well as discrepancies between design intentions and the built reality. Teacher support enables the students to "read" and interpret the traces of wear and tear, weathering and succession in order to determine, for example, patterns of use, misuse or maintenance as well as the causes of change. The students then develop optimisation strategies for deterring weakness and vulnerability in future projects within a classroom learning context. These field learning activities are complemented by a series of lectures and seminars focusing on e.g. detail design, materials, construction detailing and the processes of change. The students produce a variety of texts, photo documentations, diagrams, sketches and technical drawings to present their findings allowing for diverse forms of assessment (see Figure 4). This method offers a more integrative approach to teaching landscape construction. Students confront all facets of a project simultaneously, they need to think, discuss and analyse built landscape before formulating multifaceted submission documents.

These research and associated teaching methods treat built landscape projects as research objects, gaining knowledge for, continued optimisation of design, and detailing and maintenance practices through monitoring and evaluating processes of change over time. They represent an exemplary way to combine the synergistic potentials of teaching, research and professional practice. The field-based learning activities provide students with the opportunity to contextualise their learning experience within an academic framework.

References

- Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit -BMUB-, Berlin (Ed.) (2015). Grün in der Stadt - Für eine lebenswerte Zukunft. Grünbuch Stadtgrün. Berlin: Self-published.
- Kirkwood, Niall (1999). The Art of Landscape Detail: Fundamental, Practices, and Case Studies. New York: Wiley.
- Kolb, D. (1984). Experiential learning: Experience as the source of learning and development. Englewood Cliffs, NJ: Prentice-Hall.
- Wettstein, Bettina (2008). Bautechnik in der Landschaftsarchitektur - gestalterische Anforderungen und der Faktor Zeit : eine Untersuchung aktueller Landschaftsarchitektur zwischen Theorie und Praxis. Munich: Utz.

Digital Communication of Knowledge for Academic Design-Build Initiatives

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design-build | network | platform | knowledge transfer | communication

Academic Design-Build Studios engage in diverse projects throughout the world. They are often highly complex and involve numerous stakeholders of different disciplines and cultures. They therefore rely on effective communication between all parties throughout all phases of the project cycle. Digital technology offered by the worldwide web allows new means of communication and for immense amounts of information to be presented and shared. The research consortium European Design-Build Knowledge Network (EDBKN), consisting of a team of academic Design-Build practitioners, is currently developing a web-based platform designbuildXchange (dbXchange.eu) to support Design-Build stakeholders worldwide. A low-threshold, high-tech platform has been created, providing a "toolbox" for supporting projects throughout the project's life. Tools are offered for project presentation, networking, academic research, as well as dialogue and knowledge exchange between all stakeholders. This "knowledge exchange platform" allows projects to support each other by uploading information on research, design, construction details, funding, legal issues, costings, the realities of construction and much more. It will thus become a valuable source of information for all stakeholders throughout the world.

The complexity of today's architectural tasks requires highly qualified employees with both theoretical and practical knowledge and skills. These requirements are often not reflected in academic curricula. The Design-Build teaching methodology bridges this gap by establishing an educational infrastructure that reflects "real life" design processes thus contextualising student learning activities. Students receive a valuable opportunity to work in a team with a real client and realise their own ideas within an academic environment. They gain a deeper understanding of architectural concepts and benefit immensely from increased peer learning (Boud 2001).

Despite the enormous advantages of these teaching methods, there are many problems involved in initiating and running Design-Build projects. In 2011 Geoff Gjertson performed an online survey of 43 faculty members involved in Design-Build education in the US. The results highlighted the following major challenges: "Programme Challenges: The lack of integration of the programs within the curriculum coupled with the lack of acceptance and support from administration and other faculty may lead to the marginalization of Design-Build" and "Faculty Challenges: The stresses upon faculty caused by excessive workloads, multiple roles, and expanding student numbers and project scope threaten structural collapse". Furthermore, legal liability issues "...often require a faculty member to take on the role of architect for records. This factor often forces Design-Build programs to become separate legal entities to shield the university from potential lawsuits" (Gjertson 2012, pp 23-34). New forms of communication are necessary to address the increasing complexity of projects and numerous stakeholders "...all of whom have to communicate with one another in their various languages and with their various backgrounds" (Steiner 2013 pp 152-153).



FIGURE 1. Images from DesignBuild projects: "Malaab El Kobri", Cairo 2015 / Jam Manufactory, San Jerónimo Tecoaatl, Mexico 2012 / Assembly house, Guadalupe Miramar, Mexico 2009 / School, Zaachila, Mexico 2010. Photographs GUC Cairo and CoCoon Berlin

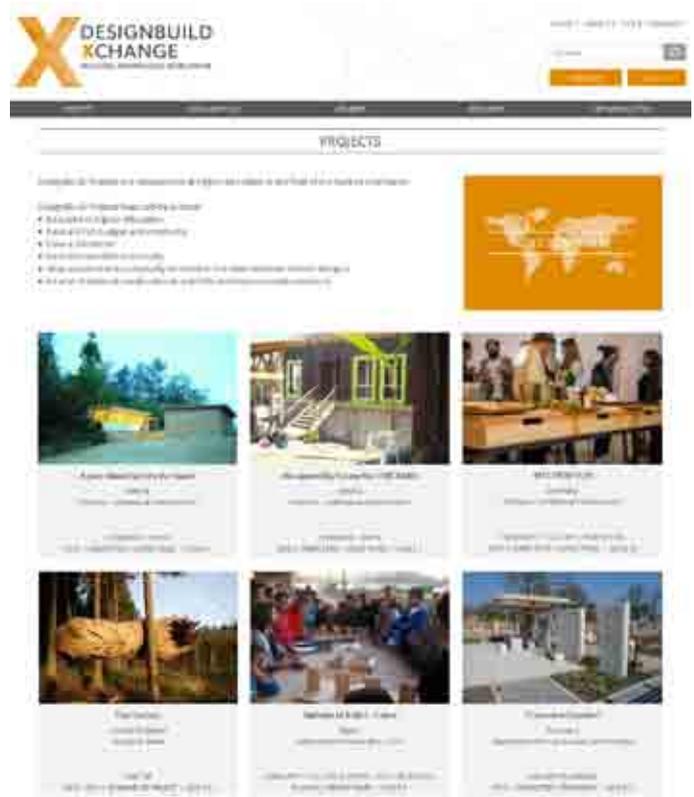


FIGURE 2. Project overview on the designbuildXchange web platform - dbxchange.eu. Retrieved 29. April 2016

In order to respond to these problems a consortium of Design-Build practitioners are developing the web platform designbuildXchange (dbXchange.eu). This EU funded research project is co-ordinated by CoCoon at the Habitat Unit, Technische Universität Berlin with its partners Ass. Archintorno, TU Wien, Dalhousie University and the German University Cairo. The web platform aims to become an everyday workplace providing a "toolbox" for supporting Design-Build Studios, mitigating problems and assisting project workflows, thus strengthening the efficiency and sustainability of Design-Build Studios. All drawings, related research documents, network partners, funding structures, legal facts as well as project results can be presented and made available to others. The responsive design of the platform allows for optimal viewing and interaction on all devices including the growing worldwide audience using mobile phones. By making the works more visible in their entirety and complexity, the platform allows the exchange of knowledge at various levels.

The target groups of the platform are all stakeholders involved in Design-Build activities, including individuals such as teachers, students, researchers, entrepreneurs and craftsmen. It serves local clients and supporting organisations such as NGOs, development agencies, foundations, the construction industry, and international academic exchange services. This diverse variety of platform stakeholders creates a common identity for the academic Design-Build community towards other interested parties (Pawlicki 2014). Registered members can contribute content to the platform by uploading a Personal Profile, posting Project Profiles, adding an Organisation Profile and uploading relevant documents. Members can also take part

in forum discussions, use the Networking Tool and download platform content. Non-registered users have reading rights only and can browse through the entire platform.

The "tools" provided on the platform aim at assisting project development. These were created by analysing the workflows of recent Design-Build Studios run by CoCoon at the TU-Berlin (see Figure 3).

These online "tools" facilitate research, dialogue, presentation and knowledge exchange, supporting projects at each project phase of the project cycle.

1) Preparation Phase

In this phase the integrated Text Search and Guided Search functions offer extensive filters for finding various types of information according to Content Type (member, organisation, project, library document, news and events) and a detailed categorisation with Tags (e.g. construction material or technique; project location; member expertise or profession). For example, Library Documents can be searched to find specific literature, research papers, construction drawings or funding strategies. Members and/or organisations can be searched to set up collaborations with clients, students or craftsmen and vice versa. The Networking Tool is an online noticeboard where members can add a post when searching for cooperation partners, funding, materials or specific knowledge.

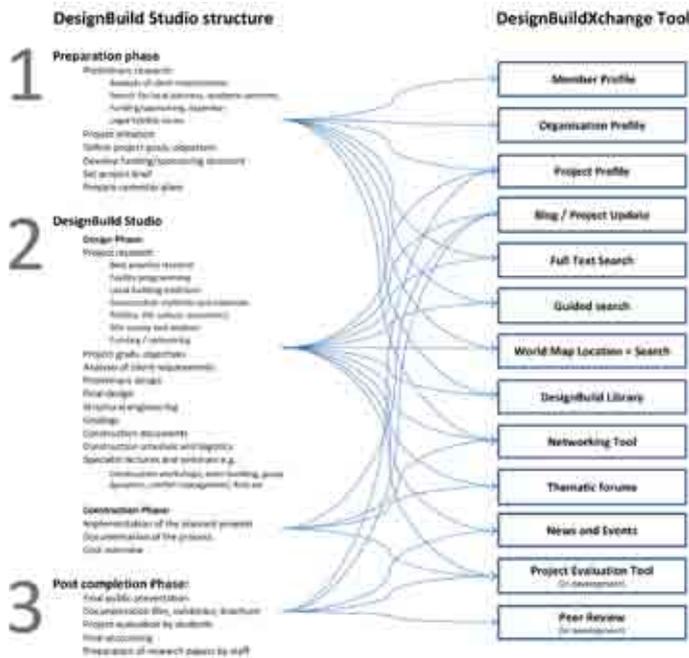


FIGURE 3. Workflow analysis of CoCoon DesignBuild projects in relation to the "Tools" available on the designbuildXchange web platform.



FIGURE 4. Project Profile on the designbuildXchange web platform - dbxchange.eu. Retrieved 29. April 2016

2) Design-Build Studio

Design Phase: Teachers and students can search the platforms database for best practice project examples, allowing an insight into what has already been achieved under similar circumstances (e.g. projects in certain regions or with a certain construction technique). Specific searches for literature, design plans, construction drawings and other documents provide the students with detailed information from the entire project cycle. The Thematic Forum enables project related discussion amongst participants or as a public debate.

In order to publicise the ongoing project a detailed Member, Project and Organisation Profile can be set up. These profile pages are automatically cross-referenced and allow for the full network of project partners to be presented within the platform. The location of projects, members and organisations is shown on the World Map Tool which can also be used as a search engine by scrolling for specific content. The Project Profile acts as a dynamic blog that can be added to or revised throughout the project cycle. It serves as an active means of communicating the status of works towards interested collaboration partners such as funding partners, students and academics (Pawlicki 2014). The project can be fully documented throughout the

project cycle by uploading documents to the platform. Logos of project partners, sponsors or supporters can also be uploaded to honour supporting institutions.

Construction Phase: The project update Blog is of most importance during this phase allowing for regular updates of project progress to be posted.

3) Post Completion Phase

Upon completion of the Design-Build Studio the Project Profile page serves as a detailed means of documentation. All related project documents, design and construction plans, costings, films, presentations and related research can be uploaded. This acts as an important reference for the associated funding organisations, academic administration and faculty members, students and clients. A Project Evaluation tool is currently being developed; this will involve setting specific project goals in the design phase and re-evaluating these goals through differing project stakeholders after project completion.

The platform is being coordinated with partner networks which have differing focuses related to their specific academic environments: the dbX Network (North America) focuses on research and the promotion of academic staff; the Live Projects Network (UK) focuses on project presentations and advocacy for Design-Build; the SEED Network focusing on social, economic, environmental design projects and post occupancy evaluations. These differences are reflected in the front end (the visible webpage) presentation of information on the different platforms, the back end (data access layer) however allows for shared components to be developed between the platforms. As joint ventures, we are currently seeking funding to sustain our platforms, connect our search engines and develop an online peer review system with an online journal. Long term financial support will be sought, for example from industrial partners or through fees for membership, peer review, congresses.

Academic Design-Build projects challenge standard practices for traditional design studios by exposing students to real world situations. We argue that Design-Build teaching methods not only intensify the learning experience but also provide students with holistic qualities that are essential to the profession today. Design-Build Studios however face many challenges at the programme and faculty level (GJERTSON 2011). The designbuildXchange Platform aims to ease faculty challenges by supporting the academic Design-Build community, providing tools for communication, presentation, knowledge transfer and public representation. This will enhance workflows and optimise the efficiency of design build initiatives. At a programme level, the platform provides evidence-based advocacy for the promotion of Design-Build educational practice.

Note

CoCoon – Contextual Construction, is a DesignBuild Studio and research unit at the Technische Universität Berlin. Staff members are Ursula Hartig, Nina Pawlicki and Simon Colwill

References

- BOUD, D. (2001). "Introduction: Making the Move to Peer Learning". In Boud, D., Cohen, Ruth & Sampson, Jane (Ed.). *Peer Learning in Higher Education: Learning From & With Each Other*. London: Kogan Page Ltd, pp 1–17.
- GJERTSON, W.G. (2011). House Divided: Challenges to Design/Build from Within. In 2011 ACSA Fall Conference, Local identities global challenges. ACSA Press, pp 23-34.
- PAWLICKI, N. (2014) High Tech / Low Threshold: Digital Communication in Design-Build Initiatives. In 2014 ACSA Fall Conference, WORKING OUT: thinking while building. ACSA Press, pp 201-208.
- STEINER, D (2013). The Design-Build Movement. ARCH+, Volume 46, Issue 211/212, pp 152-153.

Scale Matters, but Often Size is Meant ! A Critical Interjection About Scales

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large scale | small scale | size | complexity

This presentation aims at bridging a gap of terminological confusion:

Often planning professionals are talking about "large scale projects", when presenting project areas of large dimensions. "Small scale" on the other hand is used in the context of detailed design considerations for small projects. In contrast, "scale" is clearly defined in cartography as a ratio between an object's size in the real world and its representation on a map or model. In the planning disciplines scale is also used in the sense "scale of analysis", differentiating between global, regional or local methods of approach or points of view. An analysis focusing one of these (analytic) scales can of course use maps with different (map) scales. Mixing up these 2 concepts of scale and in both cases using the terms "large" and "small" usually leads to situations of misunderstanding. The proposal to be presented should initiate a step towards an agreement of a clear terminological use of "scale" with different terms or verbal values in the context of map scale and analysis scale. This could probably lead to a new entry in Wikipedia. There are several entries in Wikipedia about the term "scale", but none of them reflects the aspect "scale of analysis".

I rarely joined a scientific meeting – no matter whether national or international – without listening to someone talking about "large scale projects", when presenting a project area of large dimensions. On the other hand the term "small scale" is often used when talking about detailed design considerations for a small project. It didn't even make a difference whether the speaker was a young graduate or a well-known professional or member of the academic community.

My own academic education in landscape architecture and geography happened about 40 years ago. At that time I learned in cartography lectures and exercises the definition of the term scale and how this term has to be used in practice.

Essentially, my lessons learned correspond to a definition I found at [1]: "A map which depicts a small territory is referred to as a large scale map. This is because the area of land being represented by the map has been scaled down less, or in other words, the scale is larger. A large scale map only shows a small area, but it shows it in great detail. A map depicting a large area, such as an entire country, is considered a small scale map. In order to show the entire country, the map must be scaled down until it is much smaller. A small scale map shows more territory, but it is less detailed."

Analogue explanations can be found at [2] & [3].

The scale in this cartographic sense describes a ratio between the size of an object in the real world and its representation on the map or in a model.

In common parlance the term scale is often used in a different sense than in cartography or model building. A term like "large-scale trading" is used, when "sale by the bulk" / "trading with large quantities of goods" is meant. The term "industrial-scale" is often used in the context of industrial technology solutions with big quantities. Recently the Russian President Putin was cited, blaming Turkey for purchasing in bulk oil from the terror organisation ISIS. In this citation the term "industrial-scale" was used. [4]

In the planning disciplines scale is often used in the sense "scale of analysis", differentiating between global, regional or local methods of approach or points of view. An analysis focusing one of these (analytic) scales can of course use maps with different (map) scales.

Mixing up these 2 concepts of scale and in both cases using the terms "large" and "small" usually leads to situations of misunderstanding (e.g. Petschek 2014:69). When talking with colleagues about that dilemma, I mostly see a shrug of the shoulders and hear the appeasement: "Right, but what can we do about that?"

Steinitz (2011) emphasizes the relationship between scale and complexity, when he points out that design decisions change with scale. They are more strategic at global to regional scale, dealing with tactics at some middle scales and really dealing with details at a very local scale. In so far scale, size and complexity have to do with the "lens through which we look at the geographic study area, and the level of detail that we consider important or choose to ignore". (Steinitz 2012:19)

In the ecological sciences dealing with global problems like global warming, the protection of biological diversity and ecosystem management, scale has to do with different perspectives on the application of the concepts of measurement, analysis and inference (Peterson & Parker 1998).

According to Montello (2001) scale primarily concerns space in geography. However the domains of temporal and thematic scale are also important for geographers as well as for planners. Further, Montello (2001:13501) differentiates 3 meanings of scale in the spatial sense: cartographic scale, analysis scale and phenomenon scale. "Analysis scale refers to the size of the unit at which some problem is analysed ... Phenomenon scale refers to the size at which human or physical earth structures or processes exist, regardless of how they are studied or represented."

An example for the phenomenon scale in the context of vegetation studies could be the decision of taking vegetation stands or vegetation regions as objects of research, depending on the respective research question. Another point is the selection of existing data for the analysis of certain phenomena. A Landsat scene e.g. showing per pixel 30x30m of the ground, could be an appropriate data source in order to analyse land use pattern on a regional level, while many phenomena occur at finer resolutions than these data can provide.

As well as this, beyond our focus, there are some other scale dimensions such as (sub-) atomic or interplanetary scales, not relevant for planning considerations.

In the context of watershed management Ziemer (1997:85) gives the following definition of scale levels for analysis:

- Regional (multi-state)
- River basin (1000s of square miles)
- Watershed (20 - 200 square miles)
- Project (< 1 square mile)

Here as well as in many other cases the range of scales is summarized by the use of terminological continua, such as "local to global" or "micro, meso, macro, mega scale".

Another term showing up when talking about scales is "scalability": the ability of systems, e.g. a computer system, an economy or an organisation, to adapt to increased or decreased demands. [5] In this context terms like "up-scaling" and "down-scaling" are also used.

Concerning planning and design aspects, I found i. a. the following terms for levels of scale:

- Garden-design scale
- Site scale
- Town scale
- National scale
- Regional scale
- Watershed scale
- Urban scale
- Suburban scale

The attempt to associate a certain map scale to each of these categories is surely unrewarding.

But when not talking of map scales in the cartographic sense, terms like large and small should not be used in order to avoid the mentioned misunderstandings. Lloyd (2014:2) uses the terms "fine scale" and "coarse scale" instead of large and small.

Nevertheless, the proposal to be presented with this talk should initiate a step towards an agreement of a clear terminological use of "scale" with different terms or verbal values in the context of map scale and analysis scale.

This could probably lead to a new entry in Wikipedia (or another respective platform), discussing this terminological dilemma and presenting a solution. There are already several entries in Wikipedia about the term "scale" [6], but none of them reflects the aspect "scale of analysis".

In addition, a possible solution could also be the use of the term "size" instead of "scale" when simply talking about the dimension of a project area.

From an academic point of view it seems to be essential for me to attain a clear terminology in this context with clear definitions of terms used. That is what we do with lots of PhD thesis and other research work: to supervise our students in debating abstract concepts in order to gain clarity and distinctiveness and avoid misunderstandings.

As professionals we should apply the same principles when using the term scale.

References

- Lloyd, C.D., 2014. Exploring Spatial Scale in Geography. Wiley-Blackwell, 253 pp.
- Montello, D.R., 2001. Scale in Geography. International Encyclopedia of the Social & Behavioral Sciences. Oxford: Pergamon Press, pp 13501 -13504.
- Peterson, D.L., Parker, V.T. (Eds.), 1998. Ecological Scale: Theory and Application (Complexity in Ecological Systems). Columbia University Press.
- Petschek, P., 2014. Grading - Landscaping SMART - 3D Machine Control Systems - Stormwater Management. 2nd edition, revised and expanded. Basel: Birkhäuser, 285 pp.
- Steinitz, C., 2011. On scale and complexity and the need for spatial analysis. ArcNews, Redlands: ESRI Press (<http://www.esri.com/news/arcnews/spring11/articles/on-scale-and-complexity-and-the-need-for-spatial-analysis.html>).
- Steinitz, C., 2012. A framework for Geodesign - Changing Geography by Design. Redlands: ESRI Press, 208 pp.
- [1] <http://www.kidsgeo.com/geography-for-kids/0029-large-and-small-scale-maps.php>
- [2] <https://www.youtube.com/watch?v=Lg08g9w3by0>
- [3] <http://basementgeographer.com/large-scale-maps-vs-small-scale-maps>
- [4] <http://www.globalresearch.ca/vladimir-putin-according-to-russian-intelligence-isis-is-delivering-stolen-oil-to-turkey-on-an-industrial-scale/>
- [5] <http://www.dictionary.com/browse/scalability>
- [6] <http://en.wikipedia.org/wiki/Scale>

Design Analysis and Validation of Digital Terrain Models

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University of Porto, Portugal

digital terrain modelling | design validation | building information models

Due to the widespread adoption of Building Information Models (BIM), design validation is now part of most architectural and engineering projects. Information models aid the designer throughout the design development and implementation stages by presenting design performance simulations and identifying design problems. However what concerns terrain modeling, is that current digital design solutions do not take advantage of the analysis and design validation possibilities introduced by information models. To address this question, the authors conducted a review that included both state of the art digital terrain modeling software and BIM solutions. It was then possible for the authors to identify potential areas for development.

Research focused on three simulation tools that are part of current BIM solutions and could be integrated into digital terrain modeling, wind speed and direction, noise, and insolation. A set of designed landforms was then used to test its design performance according to the three analysis criteria. This research shows their potential uses in the terrain design process.

Introduction

Analysis and design validation have always been part of the creative process, designers have used many techniques to simulate and test their design intentions. An example are Gaudi's tensile structural models (Figure 1) used to calculate axial compression forces and determine column and vault geometries. Modern CAD programs are inspired by these analytical models using similar strategies to create surfaces and make calculations. The use of analysis and simulation is an essential feature starting as early as conceptual design stages (Kane 2005). It is important for designers to quickly develop and get feedback on their designs by regularly comparing design proposals to their predicted impacts (Ervin 2011).

Information Models

Integrating analysis and design validation into the design process and throughout the life cycle of a design, has been one of the main focus of Building Information Models (BIM). The National BIM Standards - United States (2015), define a BIM as a "a digital representation of physical and functional characteristics". Through the creation of a single shared model, analysis and design validation tasks can be performed, offering an early discovery of design errors before construction takes place (Petschek 2012).

In the Architecture, Engineering and Construction industries (AEC), BIM is probably the area with the biggest development and investments in recent years, yet as Goldberg, Holland et al. (2012) say unfortunately for landscape architects "BIM software and standards have been developed for the modelling of buildings - not sites", this prevents the profession from taking full advantage of the makings of BIM.

Digital terrain modelling in current software packages, primarily offer design validation with concerns targeted



FIGURE 1. Gaudi's tensile structural models of Sagrada Família Church, Barcelona. Source: NBS National BIM Report 2015

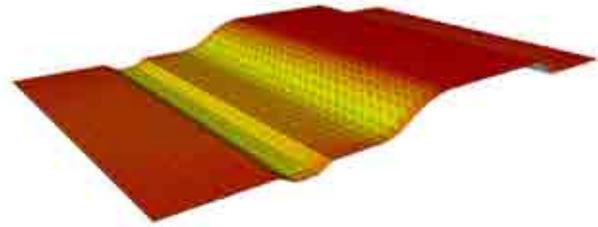


FIGURE 2. Wind tunnel simulation of the effects of landforms in wind speed and direction changes.

towards build elements, such as roads, bridges, walls and sewage systems, however with features concerning earth built forms, there is much potential for improvement. Current solutions provide classic analysis tools such as slope, sun exposure, water drop and watershed, yet grading design analysis and validation possibilities go far beyond simple slope, cut and fill and earthworks. When we look at landscape architecture project's grading solutions it is clear that in all design development stages there is demand for information and design validation.

For large scale planning projects there is a wide set of analytical tools present in the GIS platforms, but landscape planning is not the focus of this research. The focus is on the construction sector's scale, in the development of parks, gardens, plazas and urban areas.

Grading Analysis and Design Validation

Looking at the developments introduced by BIM, through the use of a digital terrain model and cross/referencing it with construction details and design intent in terms of land use or land cover it should be possible to implement tools present in other industries and integrate them into grading design models and use them at any stage of design development. Examples include:

- Assessing the stability of modeled landforms in terms of maximum slope according to the intended use, land cover and construction details.
- Overall design validation by cross referencing data from the entities involved
- Validation of construction details
- Cost simulation
- Water runoff analysis: Identify drainage problems, Retention basins dimensioning, flood simulations
- Wind direction and speed
- Noise
- Insolation

For research purposes this paper will focus solely in the last three variables, let's then look at three variables to see how they were integrated into the grading scheme:

- **Noise:** The 81-acre park near Amsterdam's Schiphol Airport where the modeled landforms are able to reduce the airport noise by 50%. The shapes are inspired by those of the existing plowed fields where by accident it was discovered that ploughed land reduced the noise to the surrounding urban areas (Bull 2014).
- **Wind:** Tejo and Trancão Park, the landforms are modelled to deflect the dominant north-eastern winds, providing comfort to the south facing slopes.
- **Insulation:** Measures the amount of solar energy received. Sun hours availability are key factors in the guidance of planting schemes, a recent example includes the London Olympic Park's planting design (Hitchmough 2016).

Information models could present interesting solutions that could support decision making during the design development stages, as a way to validate how well the proposed landforms perform within any of these the above mentioned criteria. Yet these solutions seem absent from today's digital terrain modeling software. To find a solution one must look into other digital design solutions.

Methods

To address this question, the authors looked at the possibilities introduced by digital simulation packages, to test and propose a wider set of design validation tasks that could be suitable for terrain forms and should be integrated into terrain design software packages. Several digital terrain surfaces, representing of a variety of earth forms were imported into these software packages. Even though they were not primarily designed for handling terrain surfaces, an assessment on their potential use was achievable. It was then possible to test the efficiency of the forms regarding wind speed and direction, noise reduction and insolation.

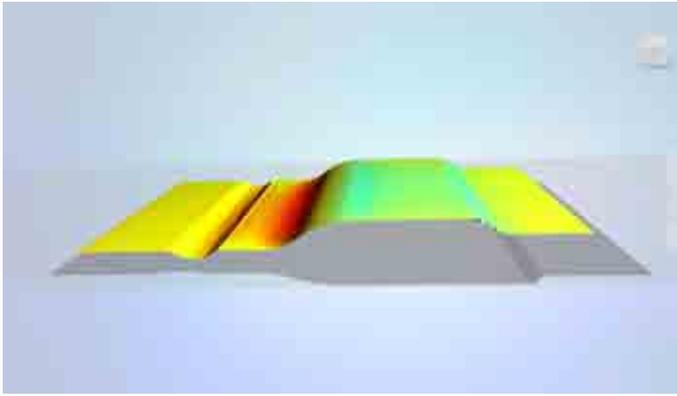


FIGURE 3. Noise attenuation simulation of the effects of designed landforms.

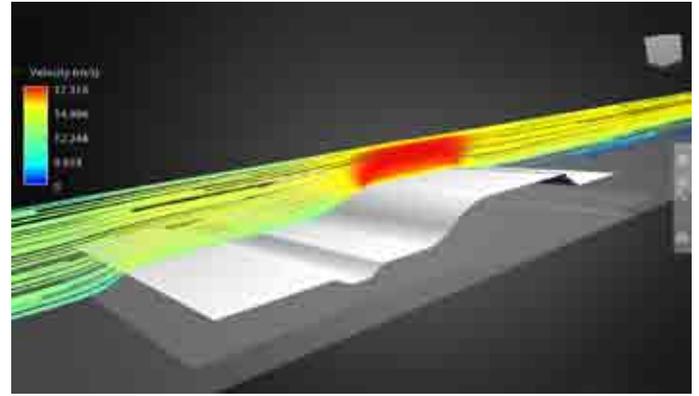


FIGURE 4. Noise attenuation simulation of the effects of designed landforms.

Design Validation

Wind flow and speed: Wind tunnel simulators have been available for many years especially in the automotive industries. In Figure 2 a proposed terrain design surface has been placed into a wind tunnel simulator. The lines in the figure represent wind speed and direction, whereas the colouring of the surface depicts surface pressure.

Noise: Noise simulators are widely used both in terms of building's acoustics assessment and in GIS scale for wind turbines noise propagation assessment. Figure 3 shows the potential uses of this tool at the scale of landscape design scale.

Insolation: There are numerous software's to assess thermal efficiency in buildings, one of the measured parameters is insolation, by assessing the amount of sun energy received by each model face. In Figure 4 these digital tools were used to test the performance of the proposed landforms.

Discussion

The simulations conducted in the three variables show the potential of the digital simulation tools. In order to make more accurate simulations, more data must be placed into the model, for example land cover and vegetation can have a deep impact in both wind speed and noise attenuation. This sets the demand for more specialist tools, which will take in consideration the specifics of grading design.

This research paper addressed three design validation criteria, yet the possibilities extend far beyond that. It is possible to develop software with a set of rules that aid the designer into achieving peak performance of their solutions in terms of efficiency, cost, maintenance, prevention of design errors and conflicts with other specialities. Current terrain modelling software available, does not take advantage of these possibilities. There is an urge for the integration of design validation tools into terrain modelling packages, aiding designers to anticipate and predict the real impacts of their proposal before it is build.

BIM is now the standard for the AEC industry, in countries like Canada and Denmark, BIM software use within the industry is above 70% and is expected to raise above 90% within the next 3 years (Waterhouse, Manning et al. 2015). However, BIM use in Landscape architecture is still at an early stage of adoption,

further developments still need to be made and our design specifics integrated into BIM software solutions.

Conclusions

Information models aid the designer throughout the design development and implementation stages, by presenting design performance simulations and identifying design problems. This research establishes a framework for the integration of three analysis and validation tools (wind, sound and insolation) into the digital design process, thus bridging the gap between design, design validation and construction.

List of software reviewed and used in this research paper: Autodesk civil 3D; Autodesk Revit; Autodesk Flow Design; Trimble Sketchup (With Noise3D Online Calculation extension); Vectorworks Landmark; RhinoTerrain; Soundplan; Autodesk Vasari.

References

- Bull, G. (2014). "Ridge and furrow." Landscape - The Journal of the Landscape Institute Spring 2014.
- Ervin, S. M. (2011). A system for GeoDesign. Digital Landscape Architecture 2011, Anhalt University of Applied Science.
- Goldberg, D. E., et al. (2012). GIS + BIM = Integrated Project Delivery @ Penn State, DLA.
- Hitchmough, J. (2016). "The Olympic Gardens." Retrieved 10 April, 2016, from <http://www.landscape.dept.shef.ac.uk/james-hitchmough/olympic-gardens.html>.
- Kane, A. (2005). Contemporary Architecture and the Digital Design Process. P. Szalapaj, Elsevier/Architectural Press.
- Petschek, P. (2012). LandscapingSMART. Digital Landscape Architecture 2012, Anhalt University of Applied Sciences.
- States, N. B. S.-U. (2015). "FREQUENTLY ASKED QUESTIONS ABOUT THE NATIONAL BIM STANDARD-UNITED STATES." Retrieved 10 April, 2016, from <https://www.nationalbimstandard.org/faqs-faq1>.
- Waterhouse, R., et al. (2015). NBS National BIM Report, RIBA Enterprises Ltd.

Teaching Materials and Construction @ University of Porto

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landscape design | landscape architecture | construction techniques |
hard landscape | landscape teaching

This paper describes the teaching of Materials and Construction in the First Cycle in Landscape Architecture at the University of Porto, and its relation with landscape design teaching.

Materials and Construction, Planting Design, and Management Techniques are the three technical pillars of landscape design teaching. Although an integrated teaching approach is adopted, there are three courses dedicated exclusively to the teaching of these technical competences.

The teaching of Materials and Construction includes grading, surface drainage, fill and cut calculation, construction materials, and construction detailing of pavements and other built structures. Knowledge is acquired in lectures, field trips, fieldwork, and studio classes. Teaching is initiated in the first year, but most competences are acquired in the second year's Construction Techniques studio. In this course, students are required to develop the technical drawings and construction detailing of projects they have developed in the first year studios. This strategy aims to promote continuity and integration in the teaching process, namely between design and construction.

Construction competences are consolidated in the third and final year with the development of a medium scale landscape project since its initial conceptual phase until the production of all the technical construction drawings.

Introduction

The teaching of landscape architecture at the University of Porto, both at the Bachelor and Master levels, is oriented to the formation of professional practitioners. Both cycles aim to provide students with design and technical competences, bridging the gap between the academic and professional world. The teaching of technical competences is grounded on three areas of knowledge: materials and construction, planting design, and management techniques.

Despite the existence of specific courses for each of the three technical areas, teaching follows an integrative and continuous approach, with technical competences also being acquired and consolidated in general landscape design studios (FCUP 2006).

While most material and construction competences are acquired during the first cycle in Landscape Architecture (Bachelor), knowledge on this theme is expanded and consolidated during the second cycle (Master).

SEMESTER 1	SEMESTER 3	SEMESTER 5
Free Hand Drawing	Urbanism	Agriculture I
Studio: Introduction to Landscape Design I	Biogeography	Techniques in Green Space Management
Elements of Geology	Studio: Construction Techniques	Studio: Landscape Design I
Mathematics	Pedology and Hydrology	Forest Biology
Biology of Plants	Free Option	Free Option
SEMESTER 2	SEMESTER 4	SEMESTER 6
Free Hand Drawing	Urbanism	Agriculture II
Plant Diversity	Art History	Studio: Green Space Management
Ecology	Methods in Geological Cartography	Studio: Landscape Design II
Studio: Introduction to Landscape Design II	Plant Ecophysiology	Studio: Introduction to Landscape Planning
Free Option	Studio: Plants in the Urban Landscape	Architecture History

Landscape Design Course

FIGURE 1. Structure of the study programme of the First Cycle in Landscape Architecture at the University of Porto.

Teaching Landscape Design @ University of Porto

The teaching of landscape design starts in the first year of the first cycle with two introductory studios, one in each semester (Figure 1). 'Introduction to Landscape Design I' provides skills in spatial organization, graphic design and communication, and 3D model construction. In this studio, students are asked to conceptualize four imaginary gardens (contour garden, vegetation garden, built structures garden, and single family garden) and represent them in a 3D model.

In 'Introduction to Landscape Design II' students start to work with real case studies. They are asked to present a new design for two small gardens in the city of Porto. These exercises aim to expand and consolidate the knowledge in spatial organization acquired in 'Introduction to Landscape Design I' and provide skills in site analysis. Representation of the proposal includes both graphical pieces (conceptual plan, master plan, vistas) and a 3D model.

The second year studios aim to convey competences in two of the three technical pillars of landscape design: materials and construction ('Construction Techniques'), and Planting Design ('Plants in the Urban Landscape') (Figure 1). To promote continuity in landscape design learning, in these courses students are asked to produce the construction drawings (plantation plans and hard landscape plans) for the proposals they have developed in the landscape design introductory studios.

The third year design studios aim to consolidate the acquired knowledge in landscape design with the development of a full project (proposal + construction drawings + construction specifications) for a medium scale garden in the city of Porto. In the first semester ('Landscape Design I'), students are required to do the site analysis and produce a new design for the garden.

In the second semester ('Landscape Design II'), they are asked to develop the technical drawings of their proposal.

In the third year curricula two courses are also included dedicated to the teaching of the third technical pillar of landscape design: Management Techniques ('Techniques in Green Space Management' and 'Green Space Management') (Figure 1).

Teaching Materials and Construction @ University of Porto

The teaching of materials and construction starts in 'Introduction to Landscape Design I' (Figure 2). In this course students are required to design and build a 3D analogic model for three conceptual gardens, being allowed to use, in each of them, only one landscape element (landform, vegetation, and built structures). The landform garden introduces students to design with contour lines and to terrain grading. Similarly, the built structures garden introduces students to landscape design with hard landscape elements.

To design with contours and overcome slope constraints are main goals of the fourth exercise of 'Introduction to Landscape Design I'. For the single-family garden exercise, students are required to build a handicap accessible residential garden, in a 20x30m plot with a homogeneous 8% slope. This task requires the creation of flat areas for house implantation and recreation activities, and the design of pathways with 6% slope. Additional requirements are a balance between fill and cut, the minimization of retaining walls, and the maintenance of the original slope in plot limits.

The acquisition of materials and construction competences continues in 'Introduction to Landscape Design II'. Prior to their proposal for the two gardens, students are required to

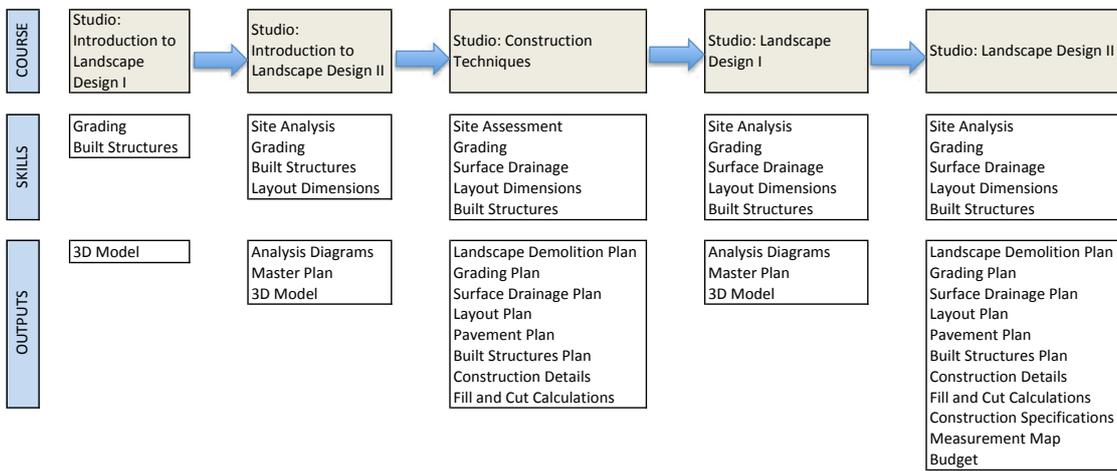


FIGURE 2. Materials and Construction study plan at the University of Porto.



FIGURE 3. 3D Models for a 11% slope garden (Largo do Ouro).

undertake an analysis of the site including the assessment of vegetation and built elements (pavements, curbs, walls, stairs). Assessment of built elements includes identification of the building material, and evaluation of condition and potential to be reused or recycled. This assessment will inform the proposal by determining which existing built elements to maintain or relocate within the site.

While the first exercise concerns the proposal for a flat garden, the second exercise concerns a proposal for a garden with an 11% slope. This latter exercise aims to add and consolidate skills in grading and designing with contours (Figure 3).

The core of materials and construction competences are acquired in 'Construction Techniques'. The curriculum of this course includes site assessment, grading, fill and cut calculations, surface drainage, layout dimensioning, materials and construction detailing of built structures (pavements, retaining walls, walls, stairs, etc.). Knowledge is acquired in lectures, field trips, fieldwork, and studio work.

In this studio, students are required to develop the hard landscape construction drawings for the proposals they have developed in 'Introduction to Landscape Design I'

(single-family garden) and 'Introduction to Landscape Design II'. For each garden they should develop the demolition plan, the grading plan and corresponding fill and cut calculations by the grid method and by the section method, the surface drainage plan, the layout plan, the pavement plan, the built structures plan, and the necessary construction details (Figure 2).

Field trips to landscape construction sites are an important teaching method in this course as they allow students to observe the materials and the construction techniques of hard landscapes in situ. Guided field trips to built areas are also useful, as they allow the observation and identification of construction materials, the observation and measurement of built elements dimensions, and the identification of maintenance problems.

JARDIM DO MORRO



L&AP Licenciatura em Arquitetura Paisagista | Faculdade de Ciências, Universidade do Porto
 Ano letivo 2013/2014 - 1º Semestre | PROJECTO DE ESPAÇOS EXTERIORES | Ana Catarina Teixeira

FIGURE 4. Proposal for medium size garden (Jardim do Morro)

In the third year, all the acquired competences in landscape design are called to produce a proposal and the corresponding construction drawings for a medium size garden in the city of Porto (Figure 4). In 'Landscape Design I', students do the site analysis and produce a proposal for the garden. In 'Landscape Design II', they develop all the construction drawings (hard landscape plans, plantation plans, and maintenance plan) for project implementation, and the corresponding construction specifications, measurements, and budgeting. Both courses aim to consolidate and integrate knowledge in design development and in the three technical pillars of landscape design.

Conclusions

Materials and construction is one of the three technical pillars of landscape design teaching at the University of Porto. Teaching of this subject follows an integrated and continuous approach throughout the First Cycle in Landscape Architecture. Materials and construction competences are acquired gradually both in landscape design studios and on a specific course ('Construction Techniques'). Third year landscape design studios promote the integration and consolidation of all the acquired conceptual and technical competences.

In a recent survey, the majority of University of Porto Landscape Architecture graduates classified their academic education as very good. When asked to provide suggestions

to improve the curricula of materials and construction, they mentioned the need to obtain competences in irrigation, and to strength the competences in budgeting. Alumni also brought up the need for a closer contact with the practice of landscape construction activities, namely through the introduction of a hands-in exercise or course.

Some of these suggestions have already been introduced in the new bachelor's study plan starting in 2016/2017. However, strategies ought to be found to bridge the identified gap between theory and practice in hard landscape construction.

References

FCUP, 2016. 'First Degree in Landscape Architecture. Study Plan' (website), https://sigarra.up.pt/fcup/en/CUR_GERAL.CUR_PLANOS_ESTUDOS_VIEW?pv_plano_id=3179&pv_ano_lectivo=2015&pv_tipo_cur_sigla=L&pv_origem=CUR, accessed 30 April 2016.

Integrating Cross-Discipline Collaboration into Landscape Architectural Curricula

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cross-discipline collaboration for landscape architects |
teaching multidisciplinary collaboration in academic settings |
landscape architectural construction pedagogy

As a result of the global sustainability movement greater collaboration between landscape architects and related design professionals is an increasing necessity. As educators how can we prepare students for this aspect of professional practice which is so critical in achieving sustainable practices? How can we expand landscape architectural curricula to integrate elements of cross discipline collaboration which require an understanding of other design professions and the construction process?

One method is to implement a programme-wide approach, utilizing both technical classes and studios, to demonstrate the role of landscape architects in the modern design process, where the scope of work interacts highly with other design professionals and the construction process. By combining a series of lectures, guest speakers, site visits, integrated design studios and competition opportunities the aspects of cross discipline collaboration can be integrated within the overall programme.

As educators it is our challenge to advance the content of landscape architectural curricula in order to empower a new generation with the skills to engage design teams within a complex design process which will address environmental and sustainability issues of the future.

Introduction

The many facets of cross-discipline collaboration bridge between the interactions with allied design professionals, detailing of specific design solutions and facilitation of the design process within an integrated design team. Given its complexity it cannot be addressed comprehensively in a single class but needs to be addressed programme-wide and integrated into several courses within the overall curriculum. The integration of cross-discipline collaboration into landscape architectural curricula will enable students to gain an understanding of the design process, content of construction documents and project manuals, and of the construction process itself. This layer of information is a critical next step in landscape architectural pedagogy.

Methods Construction Classes

Within construction classes the topic can be incorporated through lectures, guest speakers, and a review of construction documents and design details from relevant case studies. The initial lecture should introduce an overview of the topic and present a suitable project in which the instructor has either been directly involved or has intimate knowledge. The instructor must have detailed knowledge of the design process for that specific project in order to relay the relevant information which pertains directly to the cross-disciplinary aspect.

Once the instructor has identified a suitable project on which they were either the primary landscape architect or have access to the designer and the relevant drawings, specific examples or components of the design can be highlighted to demonstrate the multidisciplinary aspects.



FIGURE 1



FIGURE 2

FIGURE 1. Landscape over structure construction detail

FIGURE 2. Integrated design process diagram

These should be presented to illustrate both the design concepts, goal of the proposed solution and the design coordination between disciplines (Figure 1). Since cross-discipline collaboration relates to the interaction between designers it is critical to provide the following:

- Background of the design problem
- Intent of the proposed solution
- Steps required to facilitate coordination
- Design professions related to the proposed solution

To demonstrate the documentation process a review of selected construction details is recommended in order to highlight specific constructability considerations, material selection and design intent. With the rapid development of new materials and construction technology detailing for sustainable landscape designs and the knowledge required to implement specialized details is essential.

Guest Speakers

The next method to introduce the process of cross-discipline collaboration is to have speakers and lecturers from related professions. Arranging a series of guest lectures from allied professions including architecture, engineering, ecology, urban planning and policy makers can provide an important perspective on how other professions engage with landscape architects and how their expertise can complement the overall design process. These lectures can be scheduled to coincide with relevant site visits, case studies or exercises which support the lecture topic. This provides another perspective on the design process with information on how to engage other design professionals. (Figure 2)

Case Studies

Once the design intent and coordination process have been illustrated, a relevant case study project should be selected. Ideally this is a local project under construction where the students can be brought to the site for review and discussion. In conjunction with a review of the construction documents this is a highly illustrative method to help students understand the construction process, application of details and study of the built product. If a project under construction is not available a completed project is still a very helpful tool to explain the process of design-coordination- documentation-implementation. This will reinforce student comprehension by assisting in visualization of the material presented in class, understanding the built form and performance of implemented solutions.

Role of Landscape Architects in the Design Process

Another facet of integrating cross-discipline collaboration is to advocate for the role of landscape architects as proactive facilitators. This can be illustrated through diagrams which demonstrate the various design professions that are involved in developing integrated design solutions and the respective responsibilities. For landscape architects to become integrated team members it is essential for students to understand how to facilitate the design process, propose sustainable design solutions with integrated design elements and create documents which are based on an understanding of the construction process.

Since most design students are visual learners an effective teaching method is the use of diagrams to illustrate the complex details and design considerations typical of sustainable landscape design solutions. These diagrams serve to abstract the process and assist students in visualizing the design intent and associated design responses. In conjunction the coordination process can be explained to highlight the steps required to present the proposed solutions to the design team and respective professions including architecture, climate specialists and civil/mechanical/structural engineers.



FIGURE 3. Integrated design studio student project

Utilization of Climate Data

The integration of climate data, whether regional analysis for resiliency planning or microclimates on a site scale, also require high levels of cross-discipline coordination and can be illustrated to students through this process. Although this level of design discussion and construction complexity can be challenging for students, the topics can often be motivational for students to learn about innovative works, see the application of details to build work and broaden the scope of construction classes.

Integrated Design Studios

Another strategy to incorporate cross-discipline collaboration teaching is through an integrated studio teaming landscape architecture/urban landscape students with architecture/urban design/urban planning students. The students are composed into teams with members from each school/discipline and provided a semester project which requires each of them to collectively analyze design problems, diagram processes and programme, and develop proposed design solutions as a team. At Northeastern this was addressed through LARC 5120 Comprehensive Design Studio (Professors Michelle Laboy, Scott Bishop, David Fannon) (Figure 3).

Student Competitions

Another opportunity to expose students to cross-discipline collaboration is through student competitions. At Northeastern a multi-disciplinary student team of civil engineers, landscape architects and a sustainable building system student was assembled to participate in a competition sponsored by the US Environmental Protection Agency (EPA) for stormwater design on college campuses. Mentored by professors Professors Michelle Laboy, Ed Beighly and Annalise Onnis-Hayden students were provided the opportunity to gain a broader understanding of approaching complex problems through an integrated design team and the facilitation of the cross-disciplinary process. The Northeastern student team earned an honorable mention in the competition. (Figure 4)

Observations and Recommendations

The introduction of the cross disciplinary collaboration process can become an essential component in advancing landscape architectural construction pedagogy. Formal research such as surveys and comparative test results have yet to be performed to document results but anecdotal evidence suggests students gained a better understanding of the collaborative design process and the technical aspects of detailing solutions which require input from multiple disciplines. The exercises helped the students gain a better understanding of other professional expertise, respect for input from various team members and informed them about qualitative design approaches.



FIGURE 4. EPA Storm water competition student team entry

By incorporating the topic into both technical classes and studios the areas of technical detailing, design process and implementation can be addressed. This can be accomplished by organizing a programme-wide combination of technical lectures, allied design professional guest speakers, site visits, integrated design studios with multidisciplinary teams and competition opportunities. This approach is instrumental to emphasize the critical aspect of cross-discipline collaboration and the methods applied in today's design practice. As educators we prepare students for these new challenges which will be critical to achieving sustainable practices in the future.

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 Student Team: Jackson Plumlee, Jean Piero Arguello Ardagna, Kseniya Nagornova

Northeastern University, Boston, Massachusetts, USA
 EPA Campus Stormwater Management Competition
 Professors: Michelle Laboy, Ed Beighly and Annalise Onnis-Hayden
 Student team: Aaron Barbosa, Gregory Coyle (Civil Engineering); Jacob Abhishek (Sustainable Building Systems); Sean Kline, Sally Li, Molly McNally, Shane Sullivan (Landscape Architecture); and Traver Normandi (Environmental Studies & Economics)

Constructing Identity: Lessons from the Sky Lounge

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courtyard | landscape | sculpture | Miami | redesign

The construction of the Sky Lounge at Florida International University aspired to transform one of this young university's older buildings into one of its most vibrant public spaces. In the process, it has become an important model for campus transformation and teaching. The Sky Lounge creates a safe, accessible space that promotes interaction and advances a sense of community and livability on campus. Designed by a practicing landscape architect faculty who led the project and engaged over twenty students in its realization, the Sky Lounge has since been voted as one of the most beautiful spots on campus and now serves as an important pedagogical tool for existing design students, as well as a valuable recruiting tool. It uses over 3,000 air plants, suspended from light metal nets overhead, in addition to large custom-designed circular benches that provide a place to relax and take in the sky above, the blue glass underfoot, and the flowering vines that cover the surrounding walls. Until the redesign, the courtyard lacked any amenities. The reinvention of this university courtyard has helped elevate the university's expectations of its open spaces and how it sees them as a key to rethinking the institution's identity.

The redesign of the Deuxième Maison building courtyard at Florida International University aspired to transform the interior of one of this young university's older structures into one of its most vibrant public spaces. In the process, it has become an important model for campus renewal and teaching that espouses basic landscape architectural principles and responsibilities such as promoting human interaction and involvement, and maximizing quality of life (Fleming, Honor, Pevsner 1999: 328-330). As part of a university-wide initiative to look at the most promising places on campus to make a big, transformative impact, the Sky Lounge courtyard sought to accomplish the overarching university goal of creating safe, accessible spaces that promote interaction and that advance a sense of community and livability on campus.

The design takes advantage of the brutalist building's dramatic four-story tall interior space and uses over 3,000 air plants suspended from light metal nets overhead, in addition to large custom-designed circular benches that provide a place to relax and take in the sky above, the blue glass underfoot, and the flowering vines that cover the surrounding walls. Designed by Roberto Rovira, a practicing landscape architecture faculty at FIU's Landscape Architecture + Environmental and Urban Design Department who led the project and engaged over twenty students in its realization, the Sky Lounge has since been voted as "one of the most beautiful spots on campus" and has been prominently featured in leading industry publications such as Landscape Architecture Magazine ("Backstory: Epiphyte Club", February 2014). The courtyard has since served as an important pedagogical tool for existing design students, as well as a valuable recruiting tool for prospective programme candidates who don't always understand the creative potential of landscape architecture as a discipline that transcends horticultural knowledge and is capable of engaging design, art, and ecological agendas broadly.

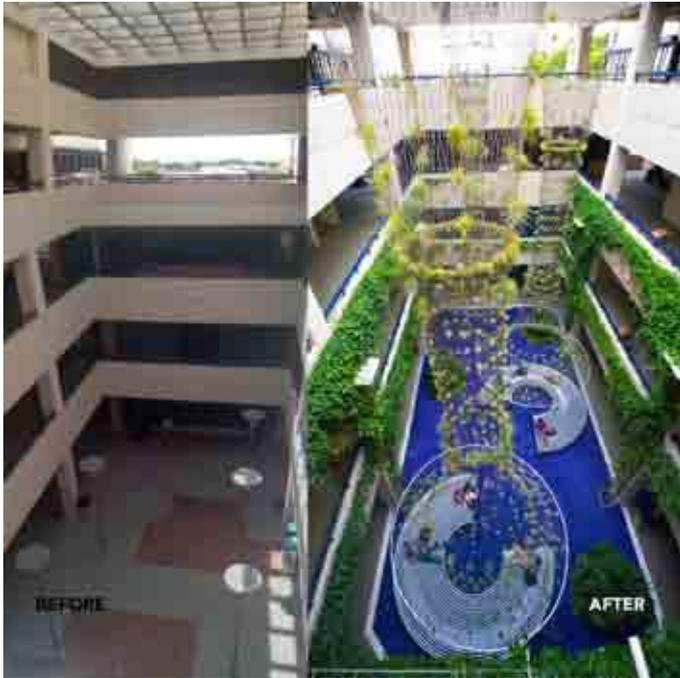


FIGURE 1. Before and After: As the second building constructed at Florida International University's young campus, the Deuxième Maison was built in 1973 in the style of "brutalism." Before the redesign, the courtyard served mostly as a walk-through space and offered limited seating and amenities. The newly designed space known today as the "Sky Lounge" comfortably accommodates a high volume of students, faculty and staff.



FIGURE 2. Custom Designed Bench: Various bench profiles were tested prior to fabricating the large, circular, powder-coated aluminum benches. The final 'lounge chair profile' was subsequently swept 270° in plan to create a versatile bench that allows for multiple postures.

Until the redesign, the courtyard had been a relatively empty walkthrough space, lacking any amenities despite the high volume of more than 13,000 students, faculty, and staff who use it every semester (Figure 1). Although mindful of the constraints of existing infrastructure underground, which include shallow fire mains and drainage lines, the design is bold in its unconventional use of materials ranging from recycled blue glass for the floor and thousands of air plants overhead. The overarching goal to create a safe, accessible space that promoted interaction and that advanced a sense of community and livability on campus was accomplished via a flexible design that serves for quiet study, conversation, contemplation, gathering and occasional presentations within the until-then underutilized 1750 sf courtyard. By rethinking the role of this indoor/outdoor university space, the Sky Lounge has helped expand the expectations of university open spaces and provided a means with which to reinterpret the possibilities of its older infrastructure.

In the space's new configuration, large, circular, powder-coated aluminum benches that were custom-designed for this project sit (Figure 2) on top of the recycled, pervious, ADA-accessible crushed blue glass flooring and are surrounded by hanging 'Sky Blue' vines (*Thunbergia grandiflora*) and 'Bridal Bouquet' (*Stephanotis floribunda*), Boston ferns (*Nephrolepis exaltata*), and lady palms (*Rhapis Excelsa*). Overhead, three braided-steel mesh nets (Figure 3) support seven species of 3,000 air plants (*Tillandsia*), which require no soil to thrive (Figure 4). *Tillandsia*, a type of bromeliad also known as epiphytes or "air plants," absorb ambient humidity and benefit from an irrigation system that saturates them with a cloud-like mist twice a week. As in the natural environment, a few specimens fall to the

ground on an ongoing basis (especially after severe storms), but in the case of the Sky Lounge, rather than remaining on the forest floor, the plants get picked up and sometimes get replanted onto the adjoining wall trellis by passers-by, while others get taken home as souvenirs that expand the footprint of the original installation.

Since its inauguration, the Sky Lounge has become a regular favourite in social media and has been prominently featured in numerous university marketing materials ranging from its general website and the cover of its graduate school annual report, to full page spreads in the main university news magazine, which reaches over 165,000 alumni and many more members of the university community. The project provided an example of how it was possible to rethink existing building infrastructure without assuming that the only solution was to entirely demolish and rebuild. Its heavy use since its opening, which has been in stark contrast to the emptiness of the space before the redesign, also demonstrated the value of a creative landscape architectural solution that looked nothing like other spaces on campus or in Miami, and cost slightly more than half of the cost per square foot of the average construction budget for a campus building at the time (\$140/sf vs. \$250/sf). As a relatively young institution which has grown to become one of the ten largest public universities in the United States and the largest in awarding bachelor's and master's degrees to Hispanic Students, the university sees itself and its South Florida context as an important laboratory for learning and as a solution centre for the region. The Sky Lounge demonstrates the role of innovative landscape architecture in realizing this vision and in helping construct the university's ever-growing, emergent identity.



FIGURE 3. Sky View: The nets above take advantage of the space's dramatic four-story height to frame the sky.



FIGURE 4. Air Plants / Tillandsia Overhead: Although the swaying mesh structures occupy a large volume in the space, they provide relatively unobstructed views through a network of epiphytes, also known as "air plants," that bloom at different times of year.

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References

Fleming, John, Hugh Honour, and Nikolaus Pevsner. 1998. *The Penguin dictionary of architecture and landscape architecture*. London, England: Penguin Books.

Teaching Landscape: Effective Exercises in Landscape Detailing as Poetic Construction

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landscape detail | tectonic theory | function | constructability | aesthetics

Landscape details are a significant language in design through which landscape spaces are realized. The subject of landscape detail is usually regarded as an issue separated from the conception of landscape design. Such a view identifies landscape detail either as the practical outcome of landscape design decisions in order to fulfill functional requirements, or as a decorative element to embellish the landscape design scheme. Design techniques for generating landscape detail form have rarely been considered to be a subject for academic study and research. Coherent, cohesive and critical discourse about tectonics, the nature of landscape construction, may provide the framework in which ideas about landscape construction can be collected and arranged, enabling landscape architects to develop landscape details as integral component of the landscape design process itself and masterfully articulate them when translating initial design concepts into built works. As landscape educators, we address this issue to our students and explore the role of landscape detail in shaping landscapes through a series of effective exercises in design studios, landscape construction courses and landscape architectural theory courses that urge them to examine the close relationship of landscape details to the landscape design process itself, interrelating structure and materials and translating design ideas into built reality.

Introduction

Despite architecture's influence in the profession of landscape architecture, despite the combination of theory and construction inherent to landscape architecture, a tectonic theory of landscape architecture that bridges the gap between theory and constructed landscapes remains undeveloped (Frampton 1995). The subject of landscape detail has been treated in landscape writings, publications and textbooks in various ways. Usually, it is regarded as an issue separated from the conception of landscape design. Such a view identifies landscape detail either as the practical outcome of landscape design decisions in order to fulfil functional requirements, or as a decorative element to embellish the landscape design scheme. Moreover, design ways of generating landscape detail form have rarely been considered to be a subject for academic study and research (Hutton 2013). Coherent, cohesive and critical discourse about tectonics, the nature of landscape construction, may provide the framework in which ideas about landscape construction can be collected and arranged, enabling landscape architects to develop landscape details as integral component of the landscape design process itself and masterfully articulate them when translating initial design concepts into built works (Kirkwood 1999).

This paper explores the use of effective exercises in landscape detailing as poetic construction in teaching landscape architecture associated with scholarship in theoretical discourse as well as building practice. The purpose of this paper is to summarize lessons learned from implementing tectonic-enhanced teaching in landscape architecture courses. The lessons are documented as challenges and opportunities based on the last two-years' assessment study of teaching landscape courses based on an enhanced perception of tectonics as a means to realize design studio projects as well as comprehend past and contemporary landscapes beyond their aesthetic



FIGURE 1. Landscape design as an outcome of well-designed and executed landscape details: Capturing the water movement.



FIGURE 2. A series of landscape detailing such as terraces and ramps, walls and steps to shape space and support human activities becomes major part of the design concept at studio work.

values. This paper aims to inform landscape architecture educators realize the opportunities when landscape construction processes are introduced to landscape teaching, and provide suggestions for bridging the gap between theory and constructability.

Materials and Methods

As landscape educators, we explore the role of landscape detail in shaping landscapes through a series of effective exercises in design studios, landscape construction courses and landscape architectural theory courses that urge them to examine the close relationship of landscape details to the landscape design process itself, interrelating structure and materials and translating design ideas into built reality. We propose an integrated design of teaching that is based on constructability as a poetic expression of landscape design. This approach includes materials, methods of construction and aesthetics as a unified whole that is part of design studio projects as well as theoretical and technological courses in landscape architecture intended to bring about the poetics of materials and detailing as the major component in landscape design. It features a series of lectures, seminars and site visits that introduce students to the role of traditional as well as innovative materials and methods of construction in landscape architecture as an integral part of the design concept. Therefore, during the studio work students are guided to explore the use of different materials, sizes, textures and patterns in shaping their landscape schemes and formulate their concepts according to the selected materials and detailing and vice versa.

Teaching Landscape Detailing as Poetic Construction

Landscape details are the means to realize landscapes. There is an indispensable interdependence between space, materials and landscape details which organize it and make it tangible. In such a relationship the materials not only express and develop in the best possible way their characteristics, but they also provide better movement of people in the landscape and a substantial contact between people and the materials of the landscape. Every combination and arrangement of materials results in landscape details which intensify the strength and clarity of expression of each material and produces specific qualities

and sensations in the space (rhythm, movement, and dynamic interrelationships).

Therefore, the proposed of the teaching revolves around ways to explore the role of landscape detail in shaping landscapes through an examination of its relationship to the landscape design process. In particular, it attempts to demonstrate the significance of landscape details in translating design ideas into built reality. We consider the process of developing landscape details as an integral part of the landscape design process itself, interrelating structure and materials, bridging the gap between utopian landscapes and projects that could be constructed. Such a teaching approach, seems to be an interesting teaching tool for landscape architecture students who understand landscape design as an outcome of well-designed and executed landscape details that express the times, the process, the passion and the care bestowed upon any work of landscape architecture.

(Figure 1)

Landscape architects realize landscape spaces in the same way an architect articulates the volumes of the buildings: mainly by the use of materials in all possible combinations. In landscape, we drop the structural shell and the volume is defined by a) Earth, paving, water and plants (the main stuff of any landscape scheme) and b) Structural elements (such as fences, shelters, terraces, levels, steps, vertical elements, roof shelters, and lighting effects) add more interest and richness and are equally important landscape details.

In our teaching agenda we consider earth as a dynamic and plastic element which undergoes constant change and development and may result to a series of interesting landscape detail elements such as terraces and ramps, walls and steps to shape space and support human activities (Figure 2). As for water, it has a number of forms that may result in a number of landscape details depending on certain situations. Whatever its type, water is a plastic element in the landscape, a landscape detail which functions as a primary component in the organization of space. Moreover, as a landscape detail material, plants are the best definers of spaces. In landscapes, they may create interspatial vistas through which landscapes are experienced. Lastly, structural elements are considered equally



FIGURE 3. Structural elements are considered equally important in enhancing the quality of the landscape experience.



FIGURE 4. A tectonic approach towards design may be defined as holistic since it is simultaneously moving from concept to detail, from detail to landscape, landscape to detail.

important in enhancing the quality of the landscape experience (Figure 3).

When landscape details are brought together, the result is landscapes that are interactive with time and in which the creation of livable and lyrically experienced spaces is celebrated. Creating landscape details several issues are addressed such as dimension, scale, proportion, selection of materials, assembly, placement, and careful weighting of the landscape design parts. A number of issues are considered such as the relationship of surface, pattern, and the form layout of the ground plane. A tectonic approach towards design may be defined as holistic since it is simultaneously moving from concept to detail, from detail to landscape, landscape to detail. (Figure 4)

Conclusions

Landscape details are a significant language of design through which landscape spaces are realized in response to specific concerns arising from site, climate and functional requirements. Elements and materials are assembled, formed, and shaped in direct and simple ways, offering at the same time visual and tactile richness. The interrelationship between detail and design is significant in process of conceiving landscape space and form. It is therefore important to reconsider the role of landscape detail within the field of landscape architecture. Landscape design is an outcome of well-designed and executed landscape details. Details are the lasting fingerprints that express the times, the process, the passion and the care bestowed upon any work of landscape architecture. Such a teaching approach tempts to bridge the gap between design concepts and constructability as well as to elevate materials to a poetic dimension that goes beyond the necessary fulfillment of functional requirements or decorative components of a landscape design scheme.

References

- Frampton, K., Cava, J. (ed.) 1995. *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture*. Cambridge Massachusetts, London: MIT Press.
- Hutton, J. 2013. Substance and Structure I: The Material Culture of Landscape Architecture. *Harvard Design Magazine* 36, 116-223.
- Kirkwood, N. 1999. *The Art of Landscape Detail: Fundamentals, Practices, and Case Studies*. New York: John Wiley & Sons.

Teaching the Craft of Landscape Architecture: A Design/Build Approach

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craft | design/build | material expression | education | service

The role of craft and craftsmanship, often ignored in most landscape architecture curricula, creates a gap between design and the art of making. Construction courses focus on material composition, structural properties and communication (construction documentation) ignoring the traditions of Downing and others who felt craft symbolized the values communities hoped to embody. How a material is rendered, carved or cut, assembled, bolted or jointed, or finished, weathered or painted conveys meaning, references and symbology. Interesting and powerful work is and has come from those who identify as makers - Andrew Goldsworthy, Isamu Noguchi and Richard Serra and those who explore not only the visual but also the sensory tactile qualities of material.

As architect Pallasmaa offers, "In the experience of art, a peculiar exchange takes place; I lend my emotions and associations to a space and the space lends me its atmosphere, which entices and emanates my perceptions and thoughts." He later observes that "In creative work, both the artist and craftsman are directly engaged with their bodies and their existential experiences rather than focusing on an external and objectified problem." Pallasmaa, (2012) How can we address the many pressing social and ecological challenges we face and create projects that probe the deep spiritual and existential questions through craft and material expression and bridge the gap between art and science.

The community design/build model of teaching achieves several objectives:

- Uses experiential learning to make the concepts of building and craft more accessible than is possible using the traditional lecture/classroom model.
- Provides tangible amenities for the partnering communities
- Encourages hands on exploration of craft using traditional and digital tools.
- Celebrates the culture(s) of the communities served.

In this reflective paper, the author will describe the evolving goals, objectives and successes of this 20 year old programme, critique its shortcomings and challenges and discuss why it is important to the landscape architecture curricula and the mission of higher education.



FIGURE 1. Shade structures at the Rab Psychiatric Hospital. The stone walls are an important cultural symbol on the Adriatic islands and were requested by the community.



FIGURE 2. The seating was designed to accommodate differing ways of seating, lying and gathering and allow for patients to choose the best option for them at that time.

Introduction

“I think the introductory construction courses helped me to understand the general concepts and materials behind our designs. The design/build classes helped bring it all together, and it stretched each concept further. Scheduling, cost estimates, suppliers and availability can’t be learned in the classroom very easily. The classes build upon each other, which was extremely helpful in holistic understanding.” Third year BLA student

Landscape architecture education embraces a gamut of learning, from design theory to environmental psychology, ecology and construction technology. As faculties adjust course offerings to keep current with relevant research in their specialties and with changing digital technologies, students find fewer opportunities to practice and learn the craft of building. The University of Washington design/build teaching model meets this challenge by immersing its graduating class each year in designing and building a community amenity. In so doing, we hone skills introduced in the curriculum, and provide both service learning, and a community participatory design experience. The learning model fundamentally integrates design and construction. Each intention, of conceptualizing and making is considered continually from both points of view. Many projects have focused on sustainable design, therapeutic gardens and children’s environments. Students work with specific marginalized communities unfamiliar to them, and they awaken to difficult social justice issues. Students witness the ethics and implications of their actions and interventions as they assess whose needs are being overtly addressed. Students take on multiple and changing roles, and in the context of these broader goals students are taught the specific skills of project management, participatory community design processes, design and construction, graphic and verbal communication.

The valuable components of design/build in a landscape architectural education:

- Application and Experimentation
- Critical Reflection
- Complex collaboration and community service
- Self-directed education and responsibility

Professor Iain Robertson defines higher education in two ways. Firstly “higher education” is teaching the KSA’s (knowledge, skills and abilities) and secondly, “higher education” is an exploratory pursuit that develops and integrates a student’s skills, abilities, attitudes and experiences. Practitioners seek students with “the abilities to think originally and creatively; to understand and empathize with sites; to weave together disparate and sometimes conflicting views, desires, and the needs of the clients and communities, to work on teams and to trust and use their own insights and experience.” (Winterbottom 2002; Bennet 1998)

Educator Ernest Boyer suggests that scholarship should address the social crises of the day through real life application, therefore education will become more relevant and opportunities for applied study and scholarship better integrated into the classroom. He states: “Given these realities, the conviction is growing that the vision of service that once so energized the nation’s campuses must be given a new legitimacy. Can we define scholarship in ways that respond more adequately to the urgent new realities both within the academy and beyond?”



FIGURE 3. Workshops on craft techniques, safety and tool use are held during the working day and industry consultants often come to the site to offer demonstrations.



FIGURE 4. The building process is collaborative and uses ingenuity such as the home made tampers to compact the gravel.

In the design/build model, students acknowledge that the craft of building is the integral component from conceptual design through project implementation. The practicality of building, of responding to community needs under financial and time constraints challenges students to be intentional and creative in all integrated endeavours. Students test and refine their skills of communication within an interdisciplinary network of participants, for example, of occupational therapists, industrial designers and medical staff. To address increasingly complex needs, students base their designs on evidence not on the hypothetical. The act of building brings the "higher education" approach to the groundwork of problem solving and design. The community is engaged through charrettes, participatory discussions and group visioning exercises, to achieve a user responsive design. Students work closely with material suppliers, specialty contractors and fabricators, and they collaborate with other academic departments and host universities.

In 1995 the University of Washington's Department of Landscape Architecture adopted the design/build teaching model for their BLA capstone studio. Each year a design/build 6 credit project is completed locally in Seattle. It is also offered as an international study abroad programme with projects completed in Guatemala, Japan, Bosnia and Herzegovina and Croatia. The programme welcomes projects with communities that are underserved in professional practice. Thus students have worked in high-risk environments with communities impacted by violence, intense poverty, trauma and stigmatization.

Course organization

The design/build programme is intensive and is structured around four objectives:

1. Immersion and cross cultural exchange and awareness.
2. Participatory community design.
3. Building, material investigation and craft.
4. Travel with purpose: to gain a deeper understanding of the environmental and cultural phenomenon of the country.

Constraints

"It's great to see how our design translates, and to see all the stages in-between. Products, price, and availability have informed and changed our original design, but our main concept has held strong. This testifies to the importance of having a strong design concept." Second year BLA student

The problems and constraints of the design/build model arise chiefly from liability, time management and assessing the scope of work. Liability dictates the types, locations and construction methods of potential projects. Time management and scope of work requires that the design aligns with available resources and with the students' own skill level of crafting.

Time is compressed in the design/build studio and requires a team collaborative approach with a focus on efficiency and production processes. Tasks are shared and led by a rotating management team which coordinates the community design process, drafting and detailing, permitting, cost estimating, material acquisition, construction and as built drawings.

On a deadline, students must make design decisions quickly and for many this is a challenge leading to frustration. It is a big learning experience for many students, who are challenged to deal with the pragmatics that are fundamental to the project.

The design/build is offered in the last quarter of the programme when many students are transitioning from academia into the profession.

A Design/Build programme requires professors experienced in design and building, skills not typical among academics. The long held mind-set that building is a trade not a profession is in part to blame. Similarly there is a lack of support in many universities for research stemming from design/technology.

Conclusion

“I always find design/build more instructive due to hands on experience. The result is less ill-conceived, realistic, thoughtful design.” Third year BLA student

In academic programs there is a renewed interest in service learning linking the expertise sought in academia with the needs of local communities. This educational model of design/build synthesizes these two mandates placed upon faculty: teaching and public service.

How can landscape architecture departments introduce design/build studios as a part of their departmental curriculum and hire capable faculty, offer the time needed to lead these projects and ensure they will get promotions in committing to this teaching model? The first step is a discussion of the goals with faculty to establish their support. There will need to be adequate allotments of time and resources, certainly greater than a lecture class requires, and even greater than a typical studio. Another challenge involves the commonly used criteria for academic promotions, in which research and teaching is combined to produce publishable papers. The design/build model requires more student contact hours, leaving less time for writing. For design/build professors, the essential skills are in design, construction, and community process and project management. Faculties can be paired to combine these skills.

References

- Bennet, Paul 1998, *Approaching It Hands-On*. Landscape Architecture.
- Boyer, Ernest 1990, *Scholarship Reconsidered*. The Carnegie Foundation for the Advancement of Teaching.
- Carpenter William J. 1997, *Learning by Building*, Design and Construction in Architectural Education. New York: Van Nostrand Reinhold.
- Downing, A.J. (1950) *A Treatise on the Theory and Practice of Landscape Gardening: Adapted to North America; with a View to the Improvement of Country Residences*, George P. Putnam.
- Elvin, George 1993, *ParkStadt Workshop: Integrating Design and Construction in Architectural Education*. ACAS Press.
- Forsyth, Lu and McGirr, 1999 *Inside the Service Learning Studio in Urban Design*.
- Goldworthy, Andy (1990) *A Collaboration with Nature*. Harry N. Abrams Inc.
- Palasmaa, Juhani (2012) *The Eyes of the Skin*. John Wiley and Sons.
- Quayle, Moura and Douglas Patterson 1989, *Techniques for Encouraging Reflection in Design*. Journal of Architectural Education.
- Rybczynski, Witold 1999, *A Clearing in the Distance*. Scribner.
- Sennett, Richard (2008) *The Craftsman*. Yale University Press.
- Thompson, William 1996, *Building to Learn*. Landscape Architecture.
- Winterbottom, Daniel 2002, *Building as a Model for Learning Landscape Journal*.

Forging Innovative International Partnerships: A Design/Build Collaboration, Universities of Washington and Zagreb

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cross-cultural | design/build | education

Inter-cultural collaboration between universities are frequently encouraged by academic administrators but when these revolve around non- traditional learning models such as design/build, the process is increasingly complicated. Challenges arise, including different curricula goals, teaching/learning styles, course objectives, evaluation criteria, student expectations and classroom culture. In this 2015 case study, landscape architecture students and professors from the University of Washington and Zagreb collaborated to design and build a student-centered project on the Zagreb campus to increase sociability and well-being and promote ownership among students, staff and professors.

Learning by doing, ranks as one of the most successful teaching modalities when assessed for student comprehension and retention. 1. Incorporated into several landscape architecture programs in the United States, design/build is less common in Europe. 2. This represents the fourth collaboration between the University of Washington and the University of Zagreb. The highly visible project elicited a range of responses from landscape architecture professors and other non-LA professors and the administrators. Participating students evaluated the experience as highly rewarding for both advancing their knowledge base per construction, and for understanding design in the context of intercultural exchanges.

The authors will use the assessments and reflective papers of the participating students and their own personal reflections to describe the challenges they faced, with means to address cultural differences and the lessons learned.

Design & Build?

The design/build teaching/learning model integrates theoretical and practical knowledge within a multidisciplinary education context and offers innovative opportunities to reengage our students in creative problem solving by reconnecting them with the craft of building.

Experience-based learning through teamwork

In our design/build students are led, in a highly compressed timeframe, through the step-by-step process of design and construction. Beginning with a participatory design process, students understand community needs and challenges, complete spatial analysis, divide into intercollegiate teams and through a competitive process create multiple conceptual designs. These designs are vetted and synthesized with the community and a preferred alternative is created from which construction documents, cost and material estimates are completed, and the project constructed. This process guided our 4 weeks studio (Figure 1), with limited funds, materials, tools and technologies.

Based on student statements, the process can, at times be frustrating and daunting because they are compelled to articulate their ideas, defend their design concepts and mediate differences within their teams. To achieve a working, productive relationship, their ego's must be contained as they assume differing leadership and supportive roles while making rapid, timely group decisions to complete the design on time.

Through the studio, students understand and gain comfort with tools and construction procedures, and so increases their self-confidence as they transition into practice. In this process of craft making, mistakes are allowed and even encouraged as a means to support the exploration of material properties and methods including wood joinery, steel fabrication and timber framing. The student testimonies convey a satisfaction with



FIGURE 1. Design/Build process (week 1&2- design process/presentation, week 3&4- construction)

the process: “the beauty of teamwork”, as it was “personally transformative and enriching”, “an eye opening experience”, “great pleasure and honor” and “priceless experience” (Brochure Design&Build Rab 2013). Without exception students valued the social component and the friendships they had forged.

Through our programme we address specific community needs making the programme “socially relevant and ‘real’” (Papanek 1973). Through their participation, students gain a tangible awareness of those who are marginalized and/or stigmatized and gain a greater sense of empathy and awareness of their diminished social status and complex needs.

Multicultural knowledge exchange

Critical to our programme is multiculturalism. The multicultural American team with students from USA, China, Japan and Russia came to Croatia with little knowledge of the Croatian environment or culture. The Croatian and Slovenian students were participating in a new unfamiliar form of learning, in classes conducted exclusively in English. Familiarizing the American students with the specific expressions of the local culture (e.g. dry stone-wall construction) is both educational and challenging and yet through this exchange students see their work and education through differing lens, an important perspective for professional practice’s that are becoming increasingly global and diverse.

The Zagreb 2015 Workshop

In 2013 under the leadership of Prof. Winterbottom and Luka Jelušić, a former Zagreb landscape architecture student, and participation of Zagreb professors, Rechner Dika and Stergaršek, the collaboration between our Universities began with 16 Croatian students collaborating with 14 University of Washington students during a four-week studio. During this period students and professors lived and worked in a psychiatric hospital, and in collaboration with patients and staff designed and built a therapeutic garden. This inspiring experience became the catalyst for further collaborations between the universities and the hospital and a more intensive collaboration resulted with other therapeutic gardens in 2014 and 2015. (Figure 2)

The 2015 Zagreb workshop offered an opportunity to publically demonstrate the value and benefits of design/build learning on the Zagreb campus. Dika and Stergaršek have been lobbying for the inclusion of design/build into landscape architecture curriculum as a successful interdisciplinary service-learning model for the previous three years. The University of Zagreb, organized and funded this three-way collaboration with the Universities of Washington and Ljubljana.



FIGURE 2. Psychiatric hospital Rab Therapeutic gardens (2012-2015)

This workshop differed from past collaborations as the University of Zagreb partners obtained funds, acquired materials and tools, and managed the project and administrators. The University culture worried about the quality of the product, legitimacy of the construction and attention it would receive among other staff and students on the campus, was initially, quite suspicious of the pedagogy of design/build. The public access and alternative teaching/learning format created an energy that other professors found both strange and engaging. Many non landscape architecture professors were quite interested in the process and finished product. Many members of industry donated services, coming to the studio and construction site to engage with the students and offer their expertise.

Support from the city also materialized as the Zagreb campus is located in the protected area of the Maksimir Park, and any intervention is under the supervision of the City Institute for the Conservation of Cultural and Natural Heritage. The Institute showed a great understanding for the value and importance of the workshop and through the intensive communication with the professors devised a mode to simplify and expedite the procedures for obtaining the approval and directive supervision, so the workshop could comprehensively take place in its timewise extremely compressed form.

The campus lacked student centered places and this project served as a catalyst to reactivate the campus. Using input from the students this project was designed, built (Figure 3) and used by students and based on recent observations is immensely popular, being used all day in diverse ways (Figure 4). It's still not clear that it is being embraced by the administration.

Challenges of the Collaboration in a Various Educational Systems Situation

To understand the complex process of establishing the inter-cultural design/build collaborative, the significant distinctions between the two educational systems must be understood. The University of Washington Design/Build programme is offered each year as a required capstone studio and is presented internationally whenever possible. The students receive a total of 12 credits incorporating three standardized courses. The international programme comprises undergraduate, graduate and non-matriculated students from landscape architecture, architecture, anthropology, fine arts and other fields. The programme fee covers student costs, faculty salaries and in country travel.

This teaching model is less common in Croatia and when implemented, is structured as a less formal academic or informal volunteer model (e.g. "summer school of architecture" Motovun), offered elsewhere in the country. Participation is



FIGURE 3. Design/Build Zagreb 2015 result

FIGURE 4. Space being used by students

often extracurricular (diploma supplement), or extra credits are "awarded" through student/teacher initiatives. Croatian education is largely state funded and system funding for alternative learning models is not provided. Supported by the recent Bologna reforms, mobility between related faculties/schools is rare, and has only been partially achieved within the School of Landscape Architecture that was established as an intercollegiate study model.

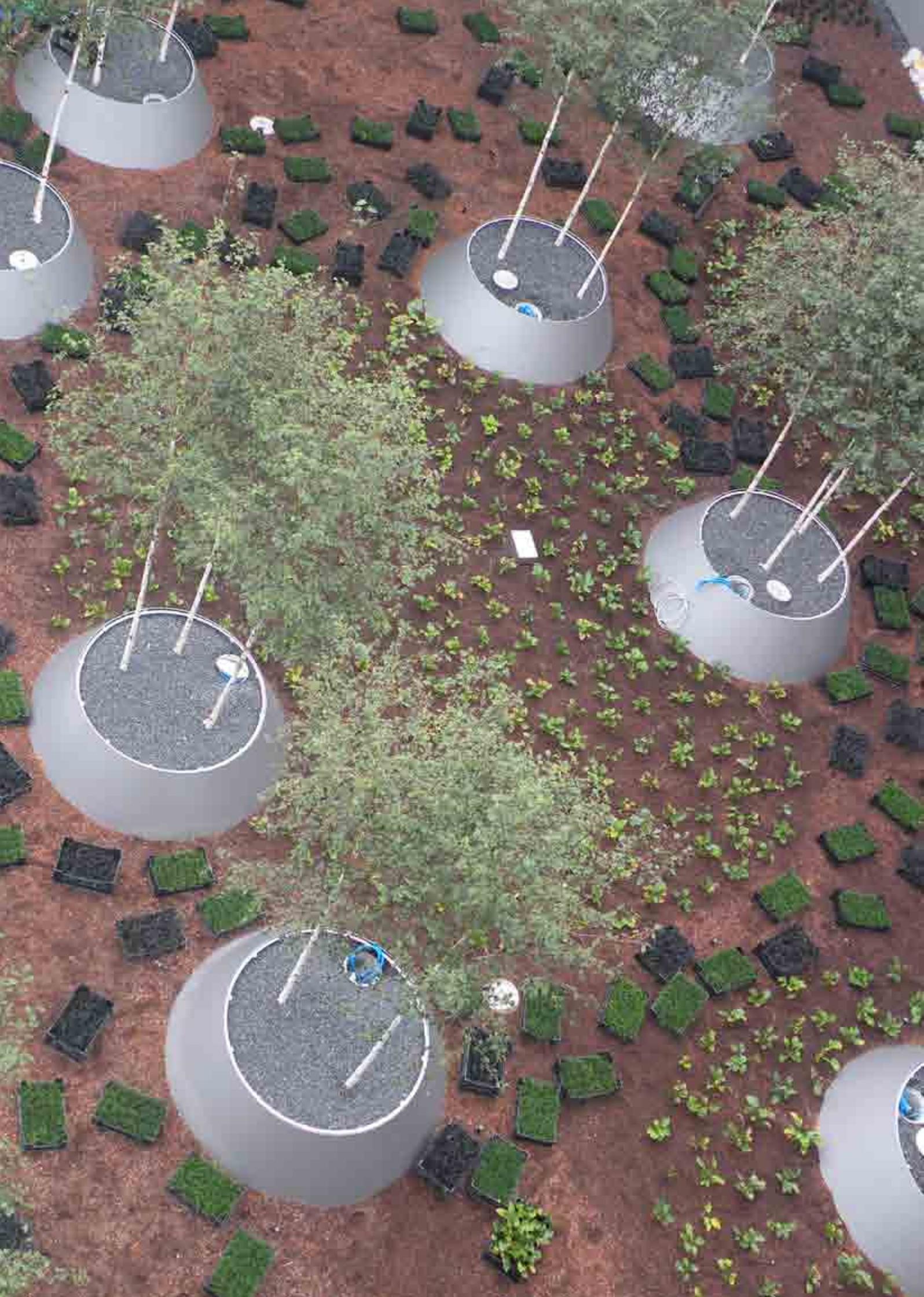
The concept of therapeutic gardens has a long history in Croatia but in a current modern context is relatively rare and not seen as foci of the landscape architecture profession in Eastern Europe. The partnering professors embraced the idea but the support within the landscape architecture department was tentative and its purpose within the Zagreb campus was not wholly embraced. The realm of therapeutic gardens is a rapidly emerging area of practice in the US and while challenging the hope is that this project will engage interest in therapeutic landscapes within the Croatian profession community

These pedagogical distinctions, compiled with differing resource and financial conditions, represent significant challenges and shifting terrain upon which this unique partnership has been forged largely through personal, non-institutional contacts and mutual confidence, establishing a posteriori without a formalized procedure. Implementing the Design&Build programme (in English) through the regular curriculum of the School of Landscape Architecture in Zagreb is an unfulfilled ambition and its future is difficult to predict.

References

- Brochure Design&Build Rab 2013 (2014): International landscape architecture student workshop, Stanko Stergaršek and Iva Rechner Dika (ed.), School of landscape architecture Faculty of Agriculture, University of Zagreb; Department of Landscape Architecture, College of Built Environments, University of Washington, Seattle; Psychiatric hospital Rab, ISBN 978-953-7878-19-1, pp 32-33.
- Papanek, V. (1972): Design for the real world, Thames and Hudson Ltd, London.

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Plant Design

PLANTING DESIGN

MICK ABBOTT, KATE BLACKBURNE,

JACKY BOWRING, CHARLOTTE MURPHY

Fractal Planting: Reorganising Forest, Farming and Cultural Landscape in Canterbury, Aotearoa New Zealand**443**

ZUZANA AMBROŽOVÁ

Thematic Gardens as a Presentation of the Results of Research and Artistic Activities**447**

GABRIËLLE BARTELSE, MARNIX TAVENIER

The Art of Planting in Landscape Design**451**

SWANTJE DUTHWEILER

Playful and Active Research-Based Learning in Planting Design?**457**

PAULO FARINHA-MARQUES, CLÁUDIA FERNANDES

A Multi-Method Approach to Teach Planting Design in a Post-Bologna Era**461**

PAULO FARINHA-MARQUES, CLÁUDIA FERNANDES,

FILIPA GUILHERME

Experimental Design and Maintenance of FCUP "Wild Garden": Researching and Learning Urban Nature**465**

IAN FISHER, ANN SHARROCK

Hart Island – A New Cultural Dimension Through Ecological Recovery**469**

NATHAN HEAVERS

Integrating Agroforestry Practices Within the Springsbury Arboretum**473**

MARK KRIEGER, VIOLA THIEL

Urban Tree Concepts in a Changing Climate: A Practical Instrument for Specific Implementation in Swiss Cities**477**

NORBERT KÜHN

Opportunities and Risks Using Exotic Species in Planting Design – How Should We Present Non-Native Plants Within Teaching?**481**

CORNELIA MÜLLER, ALMUTH BENNETT, DOROTHEE

REHR, KRISTINA GRIESE

Garden of Retirement Dementia, Katharina-von-Bora-Haus – International Ulmer Prize**2013****485**

IZABELA MYSZKA-STĄPÓR, BEATA J. GAWRYSZEWSKA

'Plant Templates' in Garden Design and Planting Plan Teaching**489**

SABINE PLENK, PAUL NEUNINGER

Natural Planting Design and Public Open Space – Lessons from Applied Research in Lower Austria**493**

OUTI TAHVONEN

Urban Vegetation for Bioretention in Cold Climates – A Short Interval Flooding Test in Finland**497**

CATARINA PATOILLO TEIXEIRA, CLÁUDIA FERNANDES

Adaptive Planting Design. Vegetation as Tool to Solve (Existing) Problems**501**

MARTIN VAN DEN TOORN

Origins and Contemporary Use of Planting Design in Landscape Architecture**505**

EWA ZARAŚ-JANUSZKIEWICZ, BEATA FORMAL-PIENIAK,

BARBARA ŻARSKA

The Street Raingardens – Students' Research for Urban Street Areas Solution on Example of Łomianki**509**

Fractal Planting: Reorganising Forest, Farming and Cultural Landscape in Canterbury, Aotearoa New Zealand

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indigenous planting | native species | fractals | Māori | cultural landscape

Designing planting begs many questions, including how to relate to the physical setting, the cultural context, and to the practice of planting and how the planter can find affinity with the plants and their placement. We explored these questions in a project for Ngai Tahu Farming, a dairy development owned by one of Aotearoa New Zealand's Maori tribes. The development is located on the Canterbury Plains, an extensive area of 750,000 hectares which is characterised by an almost complete supplanting of the indigenous flora by introduced crops, exotic production forests, and grazing land. It is estimated that only about 500 hectares of native vegetation remains, a mere 0.06% of cover (Pratt 1999). Using the underlying principle of fractals we developed a planting strategy which speaks to a range of temporal and spatial scales. Fractals and fractal patches are self-similar patterns that replicate across scales (Dramstad et al, 1996). This mechanism drove the form and content of the planting at the farm scale, extending right down to a fractal ordering of the over 750,000 plants, which cover 350 hectares of the 7600 hectare development. Currently being implemented, the all indigenous plantings, are in marked contrast to the monocultural exotic shelter belts that dominate the plains. The design expands indigenous plants beyond their usual place in gardens and reserves, to take on functional roles including shelter for animals, a native timber resource for future generations, and a corridor for native birds to travel from the South Island's back country over the sparsely vegetated Plains to Banks Peninsula. The form of the shelter belts at the regional and also farm scale, the species selection, and the planting sequences all resonate strongly with underlying Maori cultural forms, and suggest a new signature to this area that communicates culture, farming practices, and landscape health.

Introduction

Planting design is a potent dimension of landscape architectural practice. Bound up in the practice of tree planting are an inter-generational temporal perspective and a place-sensitive approach to landscape. These factors of long term vision and local distinctiveness resonate with the values of Māori, emphasising that the type and form of planting was a core component to this project for Ngai Tahu Farming, a dairy development owned by one of Aotearoa New Zealand's Māori tribes.

Context

Dairy production has been a fundamental component of Aotearoa New Zealand's economy since the early days of European colonisation in the mid-nineteenth century. Milk, butter and cheese exports tethered the country to the motherland, England, for over a century, and more recently have been key products for trading with a range of international partners. Dairy farms traditionally had an aesthetic of tidy green pastures surrounded by monocultural hedges, known as shelterbelts. It is estimated that only about 500 hectares of native vegetation remains, a mere 0.06% of cover (Pratt 1999). With the expansion of dairy farming into areas not traditionally suited to dairying, mechanised irrigation has created a different kind of landscape aesthetic. The large centre pivot and travelling irrigators require an unimpeded passage through the landscape, meaning that hedges and trees are often removed in areas of dairy conversion.

The impact of dairy conversion is especially dramatic on the Canterbury Plains, on the east coast of the South Island – an area traditionally in grain and sheep farming, with a cultural landscape characterised by a remarkable pattern of evergreen hedges defining a patchwork of fields. The shelterbelts extended for a combined length of nearly 300,000km, and protected the

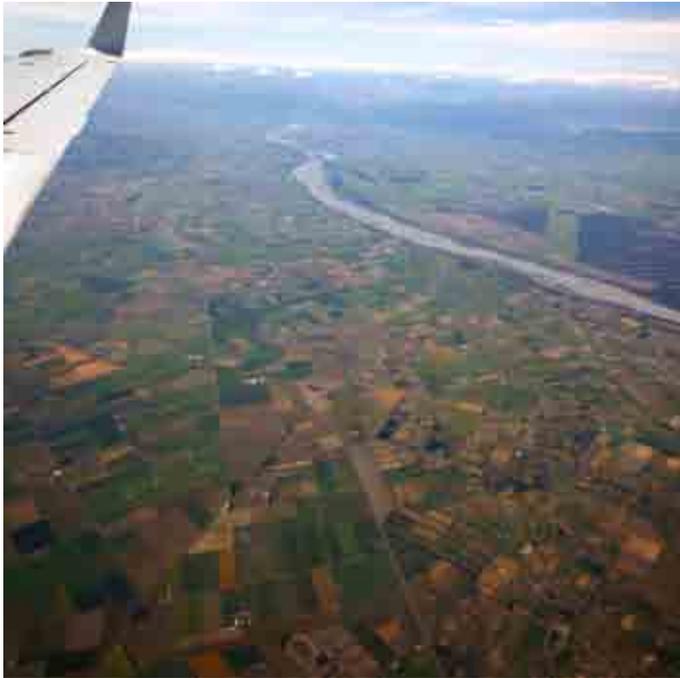


FIGURE 1. Aerial view of the northern Canterbury Plains, South Island, New Zealand. The river is the Ashley River or Rakahuri. Photo by Andrew Cooper (CC BY 3.0).



FIGURE 2. Planting concept and expression – Typology. Image: DesignLab, School of Landscape Architecture, Lincoln University.

fields from the strong and drying winds of the Plains (Price 1993). Shelterbelt species include the exotics Monterey Pine (*Pinus radiata*), Monterey Cypress (*Cupressus macrocarpa*) and Gorse (*Ulex europaeus*), and the 750,000 hectares of the Canterbury Plains is characterised by an almost complete supplanting of the indigenous flora by introduced crops, exotic production forests, and grazing land. It is estimated that only about 500 hectares of native vegetation remains, a mere 0.06% of cover (Pratt 1999). While a distinctive visual landscape – especially seen from the air (Figure 1) – it is lacking in biodiversity, providing few resources for native fauna, and is not only monocultural in plant species, but also in the cultural history it represents.

Ngai Tahu Farming

Ngai Tahu Eyrewell Farm is an industrial scale dairying development, covering 7600 hectares. As a dairy conversion irrigation is required, and will utilise centre pivots. Rather than the conversion to dairying contributing to further loss of vegetation on the plains, the vision is to take advantage of the irrigation to support endemic forestry. The opportunity for planting is site-wide, meaning that the landscape architectural contribution transcends the often limited role of ‘organising’ a site through master planning, or window dressing to provide amenity at the public interface. The Ngai Tahu Farming proposal involves planting at a scale where meaningful difference can occur, adding to biodiversity and providing an environment for native birds moving across the Canterbury Plains.

The fusion of dairying and forestry is an innovative approach that inverts the negative perceptions of dairying as ‘dirty’ farming that is also responsible for the loss of vegetation. Instead, through leveraging off the patterns set up by pivot

irrigators – including the ‘left over’ pockets between the circular areas – a shift in biodiversity is possible. This will mean a gain of 5% biodiversity on productive land – a considerable shift, given that for many such industrial agricultural landscapes biodiversity is almost completely absent. The 5% gain represents a material contribution, even on productive land, to the 17% goal for 2020 under the Aichi protocol (Convention on Biological Diversity no date).

Further, the planting framework that is interwoven through the entire site presents a reworking of the cultural landscape. Transforming the plains landscape from the limited agricultural palette of grains and sheep means also a shifting language of landscape, and a transition from the nostalgic monocultural hedge landscape to one which is vibrant and representative of a diversifying cultural presence. The proposal is one which provides the background for a provenance story, a refreshing perspective of ‘eating pure’ that counters the often negative connotations of industrial agriculture. It also does not suggest a static condition. Land use is a fluid condition, and the Ngai Tahu Farming landscape is designed to be flexible and provide a foundation from which to negotiate possible futures. A decline in dairying might lead to one of the circular areas becoming instead a residential development to support the growing cities and towns of the Plains.

Fractals

Using the principle of fractals we developed a planting strategy which speaks to a range of temporal and spatial scales. Fractals and fractal patches are self-similar patterns that replicate across scales (Dramstad et al 1996). This mechanism drove the form and content of the planting at the farm scale, extending right down to a fractal ordering of the over 750,000 plants, which cover 350 hectares of the 7600 hectare development.

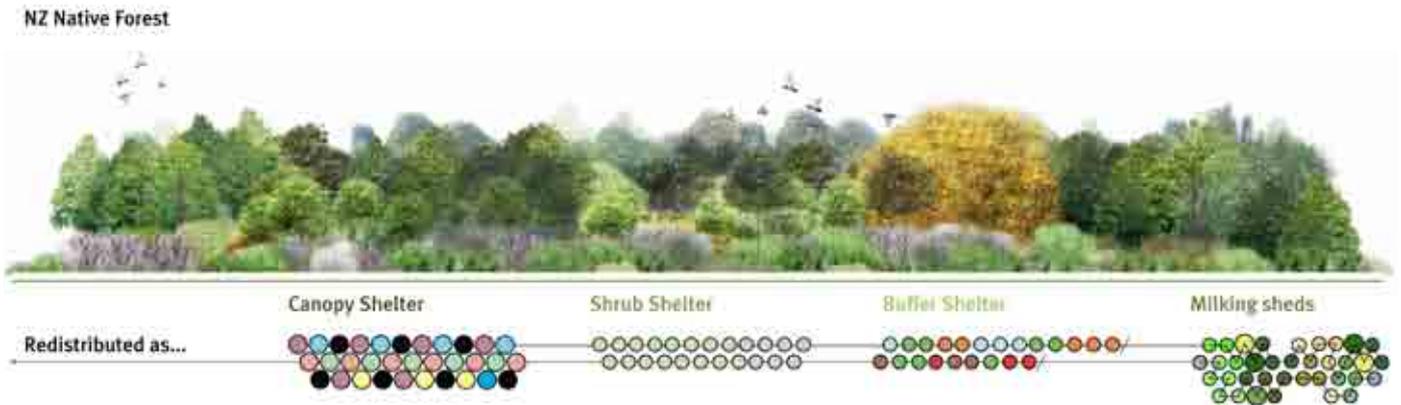


FIGURE 3. Fractal planting as seen from the air. Image: DesignLab, School of Landscape Architecture, Lincoln University.



FIGURE 4. The Ngai Tahu Farming project is located in the centre of the image, illustrating how it provides part of a connective 'bridge' for native birds to cross from the Southern Alps to the top to Banks Peninsula at the bottom of the image – across the 'desert' of the Canterbury Plains. Image: DesignLab, School of Landscape Architecture, Lincoln University.

At the plant scale, species are arranged in a rhythmical sequence. In this way meaning is created, allowing monitoring of successful or struggling species by farmers in their everyday stewardship. Twin colonnades of totara dominate the primary shelterbelt network, supported by kowhai, tarata, houhere, kohuhu and kapuka (Figure 2). At the farm scale of the pivot irrigators, patterning responds to the dominant north easterly and southerly winds and sun direction. The native plantings provide shelter for stock, and a native timber resource for future generations. Planting is set based on long range forecasts so prevailing drying winds can be avoided in the first two months. The story of Canterbury's braided rivers travelling across the plains is reinforced through development-scale patterning, which in time might operate as the project's visual gateway for people flying into Christchurch (Figure 3). And then at the expansive scale of the landscape, the proposed network

provides a primary corridor for native birds to travel from the South Island's back country over the sparsely vegetated plains to Banks Peninsula (Figure 4).

Conclusion

The planting design for the Ngai Tahu Farming development approaches the shift to dairying in an innovative way. The irrigation required to support dairying is seized as an opportunity to create a long term vegetative framework and provide the amenity needs of the development. The native planting expands the biodiversity of the Canterbury Plains, and operates as a habitat for native birds and insects. At the wider scale it becomes a vivid image of a new landscape, especially when seen from the air, and will be the key corridor for native birds travelling between Banks Peninsula and the Southern Alps.

References

- Convention on Biological Diversity, No Date, Aichi Biodiversity Targets.
[https://www.cbd.int/\\$p/targets/](https://www.cbd.int/$p/targets/) accessed 27 April 2016.
- Dramstad, W.; Olson, J. D; Forman, R.T.T., 1996. Landscape Ecology Principles in Landscape Architecture and Land-Use Planning. Island Press.
- Pratt, C., 1999. Factors affecting the establishment, growth and survival of native woody plant communities on the Canterbury Plains, New Zealand. Unpublished MSc thesis, Lincoln University, New Zealand.
- Price, L.W., 1993. Hedges and Shelterbelts on the Canterbury Plains, New Zealand: Transformation of an Antipodean landscape. *Annals of the Association of American Geographers*, 83(1): 119-140.

Thematic Gardens as a Presentation of the Results of Research and Artistic Activities

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thematic gardens | landscape architecture | education

The best way to teach landscape architects how to design plants and gardens is to have lessons directly in a place which has a high artistic value and which can very well present innovative approaches to the creation and maintenance of vegetation. Czech landscape architects are taught in the Lednice-Valtice Area (UNESCO site), which is a unique cultural landscape, maintained and created by the Liechtenstein family for over 300 years. Therefore, the Faculty of Horticulture of the Mendel University in Brno has chosen Lednice as its headquarters. Thematic gardens in Lednice form a new functional and artistic whole within this historically shaped and composed landscape and thus continue the tradition of garden art and landscape architecture, which have shaped the garden here for centuries as a phenomenon of the quality of human life in the context of European education, humanist tradition and culture. Out of the 33 proposed topics/ thematic gardens, 11 were implemented in 2015, together creating a comprehensive and clearly readable image of contemporary creative possibilities. They are not only an extensive collection of garden plants, but also a good example of their combinations and relations emerging from their artistic and ecological grouping. Earlier, a representative academic garden was created; it has become a very successful project and triggered the development of the entire university campus. Additionally, it has substantially raised the society's cultural awareness of the contemporary landscape architecture. The paper comprehensively introduces the entire university project, whose scope, educational potential and innovative approach has no parallel in Central Europe.

The Faculty of Horticulture, Mendel University in Brno, headquartered in Lednice, provides the only study of landscape architecture in the Czech Republic that is fully recognized by the Czech Chamber of Architects. The location of the faculty is not random. Lednice with its château and landscape park is a part of the well-known Lednice-Valtice Area (UNESCO site) and thus offers a unique setting for the study. The artificial landscape in this area follows from the economy and natural conditions of the land existing for 300 years under the administration of the House of Liechtenstein. The history of gardening education in Lednice goes back to the end of the 19th century, when the Higher Fruit-Gardening School (Höhere Obst-Gartenbauschule) was established there. It was the first high school with graduation of this type in the entire former Austro-Hungarian Empire. On the Liechtenstein initiative, also scientific institutions were supported there (e.g. The Duke John of Liechtenstein's Department of Plant Cultivation of J. G. Mendel in Lednice in Moravia). The Department of Horticulture of Mendel University was moved from Brno to Lednice in 1952 and a separate faculty was established on its basis in 1985. In the last five years there has been an intensive development of the entire faculty campus, in cooperation with the staff of the Department of Garden Design and Landscape Architecture. The campus is gaining an original form and a high educational and aesthetic value, which builds on the historic efforts to improve the environment to live and work in this area. In 2011, the first to open was the so-called "Academic Garden", which represents the heart of the entire faculty campus. It is a unique space for active and passive recreation and especially a representative setting of the faculty where festivals, exhibitions and study-related ceremonies can be held. It is a place where students can discuss important issues of the field, the individual garden elements, compositional principles, etc. It is a place where students can stay and be literally in touch with the



FIGURE 1. The Academic Garden is the first implement project and the heart of the entire campus

plants. In the framework of the compulsory practical training, students have to directly participate in the care of this space and thus gain an even stronger relationship with the place and the plants. The composition of the space is based on the impression formed by the complex collection of plants - from solitary specimen trees, shrubs and the ground-covering level, an exceptional collection of climbers, to flowers of all colours and production groups. Flowers in the garden are applied in different types of beds. Thus they become an illustration of an artistically conceived garden detail for students and garden visitors, complementing the Lednice-Valtice Complex by the smallest-scale perspective of the opportunities offered by the field of landscape architecture and garden design. The main communication ring covered with a metal structure for climbers logically links all the entrances and frames the central element of the garden – a recessed bowling green.

At the second stage of the faculty campus reconstruction, the first eleven thematic gardens (out of the 33 proposed) were established; they have been designed as separate functional, spatial and compositional units presenting the results of experimental, research and artistic activities of all the faculty departments to the wide public. The project is called "Labyrinth of Nature and Paradise of Gardens FH MENDELU, Lednice". It creates a comprehensive and clearly readable image of the contemporary creative possibilities and limits of the individual compositional elements and garden principles, related new techniques, technologies and media. The thematic gardens are not only an extensive collection of garden plant assortments, but above all an illustration of their combinations and relations emerging from their artistic, architectural and environmental grouping. The composition uses classic elements of the formal garden. The regular grids of trees are interweaved with quadratic forms of closed spatial units for the individual presented topics (Damec, Wilhelmová 2009).

Thematic Gardens (Damec, Wilhelmová 2009)

1 - The Silver Garden – Mediterranean

It is designed as an educational exposition of plant usage - perennials, shrubs, and trees, whose common denominator is grey to silver colour, the Mediterranean origin and the ability to grow in the gardens under Central European weather conditions. The garden is designed as a simple labyrinth, from the outside and above resembling a diamond set in the lawn. As the visitors pass through, they perceive the classic details of famous flower gardens, commemorating the inter-war epoch – the epoch of their greatest fame.

2 – The Classic English Flower Garden

It is designed as an educational exposition for the basic understanding of the artistic and ecological grouping of plants, typical of the period of the classic flower garden at the turn of the 20th century. It is established in a limited area as a mixed flower bed and a plant bordure around, a central area of lawn and a typical plant highlight in the middle.

3 – The Garden of Peonies, Irises and Hibiscus

This is an exposition of one of the most popular groups of garden plants, attractive for their unique visual and symbolic properties throughout the history of garden art, for almost 2000 years. The main area of the lawn has rhythmically located islands of flower beds, presenting the range of herbal and woody peonies, always supplemented by a hibiscus grafted to a high stem. Each bed is bordered by uniformly coloured irises of selected groups.

4 – The Garden of Grasses and Steppe Communities

Grasses and steppe communities are special representatives of the contemporary global garden. Their dynamic properties are also supported by the overall artistic concept of the exposition, which works with the contrasts of sharp shapes of the areas and the organic curves delimiting the locations of the particular caespitose species of grasses. The exhibition includes a region-characteristic steppe community.



FIGURE 2. The overall situation - 11 thematic gardens which arise in the Lednice-Valtice Area on the land of the Faculty of Horticulture in Lednice (author of visualization: Viktor Filipi)



FIGURE 3. The visualization of the thematic gardens, introduced to the public in 2015 (author of visualization: Viktor Filipi)

5 - The Garden of Penumbras and Green Shades – Rhododendrons, Hydrangeas, Ferns, Woody Undergrowth - Mosses

The central part of this garden is roofed with an adjustable shade-providing element, which has primarily a utilitarian function but also serves as an architectural element creating the atmosphere of this space.

6 - The Purpose-Built Garden

The garden is conceived as a multifunctional space designed for social and educational activities of the faculty (short-term installations, exhibitions, art experiments etc.).

7 - The Water Garden - Pool and Wetland

This garden presents a pool and wetland in their stylized and abstracted forms with details typical of animate and inanimate nature - aquatic plants, stones, animals, and natural materials composed in ecological and artistic contexts. The central motif of the garden area is a pool lined with a wooden grate designed for walking. Circular containers with an assortment of aquatic plants are rhythmically placed in the perimeter lawn.

8 - The Garden of Colours

Appropriate plant groups are represented here by the contemporarily used product ranges, convincingly showing the topic of the colours in plant metamorphoses.

9 - The Kitchen Garden

An exposition of a current topic, related to the quality of life, lifestyle, healthy nutrition and cooking. Typical parts of the kitchen garden, such as fruit tree espaliers, hotbeds, compost, asparagus furrow, vineyard, mixed vegetable beds, beds of flowers for cutting, herbs, aromatic plants in mixed and elevated beds, three fruit trees with standard stems, shelters for the summer kitchen and workshops on the topic, are composed into a pleasant unit of small scale and mild expression inducing peace and calmness of the classic kitchen garden known from the history of garden art, perceived in the unity of the useful and the beautiful.

10 - The White Garden

The spatial composition is based on the historic principle of the labyrinth; an arbour crept over with white plants is located in its spiral centre, forming the end and the climax of the wandering in the white world of garden plants.



FIGURE 4. The initiation of the establishment of the thematic gardens in autumn 2015 (author of photos: Viktor Filip)

11 – Rosarium – The Rose Garden

The central structure - the arbour - presents creeping roses in square beds, shrub roses and hybrid tea roses, as well as ground-covering ones in the bordure. The atmosphere of the rose garden is centrally supported by an element of spilling water, inducing a creative atmosphere in which flower design and flower arranging workshops are held.

The entire Labyrinth of Nature and Paradise of Gardens is undoubtedly an artistic achievement, bringing significant new solutions, although it presents traditional thematic garden segments that can be seen throughout the world (Tulln, Mainau, etc.). The authors, Jiří Damec and Dana Wilhemová, have been lecturers and heads of the Department of Garden Design and Landscape Architecture for many years, which brings another value to the campus design – a mark of the generation, the footprint of this active creative couple. After a number of successful and award-winning projects throughout

the Czech Republic they are finally presented directly at their Alma mater. The entire campus gains an appropriate intellectual content, which emphasises the ideological nature of a landscape architect's creation. The metaphorical reach to the history of the Lednice-Valtice Area culturing makes this place respectful of the local values and at the same time a contemporary ambition to build a magnificent complex with an unforgettable spatial vision reflecting the state-of-the-art of the current society.

References

Damec, J., Wilhemová: The Accompanying Report on the Documentation for Area Management, 2009.

<http://lva.dibpro.com/>

<http://zf.mendelu.cz/en/>

<http://www.taxonweb.cz/taxon-objects/19>

The Art of Planting in Landscape Design

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planting design | education method | representation |
design vocabulary | living organisms

Landscape architecture is about, trees, shrubs, perennials, vegetation, seasons, soils, smell, texture and the play of all these elements together. It was William Kent during the romantic period who saw landscape design as designing a scenery in which every element, organism or human was part of the play (Hunt 1996).

In order to be able to write a play like this it is important to have the knowledge about plants, their needs and characteristics, how they grow and change throughout the seasons and over time.

After some time of neglect, this aspect of landscape design is getting more attention recently due to landscape architects such as Piet Oudolf, Penelope Hobhouse, Gilles Clement and Günther Vogt. It is becoming an important aspect in landscape architecture education.

At Wageningen University landscape architecture students get courses on designing with plants in their second year: Planting, Construction & Representation I & II. This combination of subjects in the course aims to teach and train students in visual thinking in which planting forms the most expressive and dynamic instrument. According to Kathryn Moore, visual thinking is a method to demystify the process of designing. She states: The existence of visual thinking is taken for granted and is a given starting point in nearly all discussions about drawing and creativity....Engaging a sensory mode of thinking, particularly the visual, is seen as an essential way of dealing with many of the so-called subjective aspects of design. (Moore 2010). Therefore, we argue students will only be able to design with plants, when they understand the appearance, meaning and value of plants in designs. They need to observe plants and become aware of their changing appearance and meanings in different contexts, and they need to be able to visualise this.

To establish all of the above, the planting design assessments are linked to real life assignments. In the interactive learning approach, students get familiar with the interaction between data-design-observation-sketching-references-seasonal aspects. The courses result in: a study of perception (sketches and drawings) the development of knowledge (planting matrix) and the application of different species (planting plan, section, seasonal scheme). The course outcomes show how visual thinking helps to (re)establish the knowledge on planting in order to be able to make landscape designs in which plants are the 'actors in the play'.

Conclusion

Good and sustainable landscape design is predominantly specified by the use of plants and their characteristics. As the famous Dutch landscape architect Piet Oudolf states: Plants are the actors in the scenery called landscape architecture in every new design; they can play a different role (Conran 2009). It is therefore that we claim that designing with plants is the artistically refining of a landscape design and is therefore an art on itself which need to be thoroughly taught.



FIGURE 1. Example of freehand drawing

For some reasons the knowledge about plants or botanic has been diminished in the field of landscape architecture. The knowledge of designing with plants is since decades neglected within the academic education. Plant knowledge is experiential knowledge (in former days the so called applied knowledge on planting in the academic education). It is about craftsmanship, which is may be difficult in an academic environment.

In the Netherlands, designing with plants is developed as knowledge field by growers and designers like Mien Ruys, Piet Oudolf, Henk Gerritsen and Jacqueline van der Kloet. The development of knowledge about the application of plants in designs or designing with plants, has mostly been happening outside the academic world. Generations of students in landscape architecture have not been educated in designing with plants. The preparation of planting plans and designing with plants has become a specialism. Designing with plants is outsourced by international famous landscape architects and experts like Piet Oudolf or Jacqueline van der Kloet. This is remarkable because landscape architecture is about designing with living organisms like plants! However due to the work of specialists as Piet Oudolf, Penelope Hobhouse, Gilles Clement, Günther Vogt, more attention is payed to the use and knowledge on plants in landscape design.

At Wageningen University students of landscape architecture receive courses on planting design in their second year. These courses are: Planting, Construction & Representation I & II. This combination of subjects in the course is to teach and train students in visual thinking, so they will be able to create a scenery based on designing with planting but most of all to show students in landscape architecture that there is a very tight relationship between theory and practice. It is therefore that the writers are convinced that the knowledge about planting and its application as a practice should also be necessary part of the academic curriculum of landscape architecture.

Designing is not a blackbox. It is possible to learn to design in all its artistic dimensions. Designing is not only a talent a person has or about skills which can be trained and learned. Designing is knowledge gained by experts. Knowledge about designing with plants is often seen as experimental knowledge.

Genuine good knowledge on planting design is learned by practice and by doing it in a systematic way! To be able to do so it is necessary that tools are provided.

In the two course Planting, Construction and Representation, students are provided by the above mentioned tools. During the courses they learn about the aesthetic and botanical knowledge of planting in order to be able to design with plants.

The aim of the courses are to unlock the knowledge field of planting design for the landscape architecture students, by showing and teaching them the meaning of a successful planting design. This education starts specific by teaching the students to observe and perceive by drawing and sketching. Apart from teaching the basic skills in visual expressiveness and representation, the aim is to develop a personal signature.

The next level in the course is to develop the knowledge behind the 'image': how is the composition of the planting design built up in spatial and technical sense, which planting concept has been used, in which way has the choice of the species been influenced by the context of the location, what is the expression of the planting in the design, etc.

The last step and test phase in the courses is to apply the learned knowledge and skills in a design assignment. This assignment will be the test case to see if the students are able to use both theory and practice in their planting design.

To establish the above explained during these courses the assessments for planting design are directly linked to real time design assignments as: rural area and the urban object.

Composition of the Courses

Planting Construction and Representation I

In this first course, the emphasis is on drawing skills and plant knowledge. During this course the importance of designing with plants is explained and taught by six themes on the use and meaning of plants and planting design. These six themes are the pillars of the course. The six themes are:

1. Looking at Planting: Perceiving and Visualising

To be able to apply and implement planting in designs, it is a necessity to develop knowledge on planting. Gaining this knowledge starts with looking, perceiving the characteristics

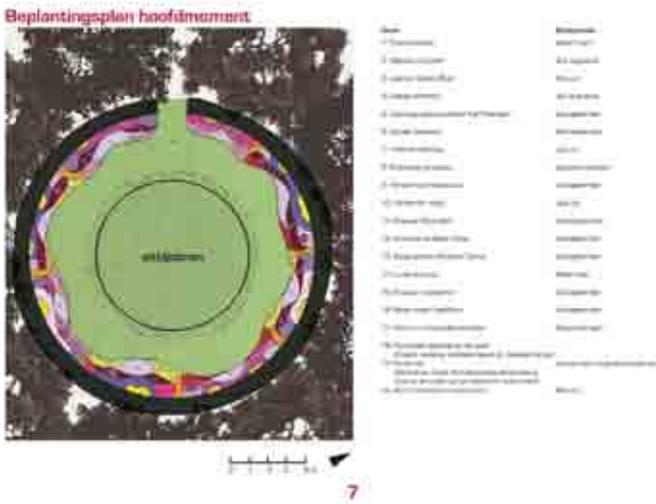


FIGURE 2. Example of digital visualisation

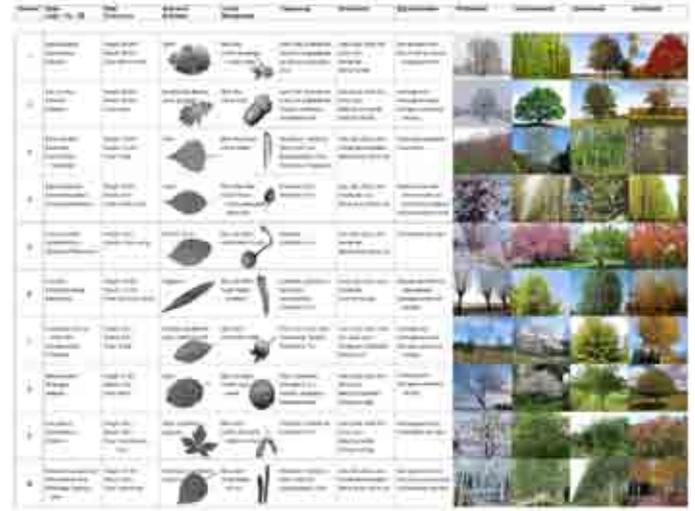


FIGURE 3. Planting matrix

and appearances of planting during the four seasons. The traditional knowledge on perceiving is trained to the students by drawing by hand. The parole during the drawing training is: Looking through drawing / drawing by looking; thinking by drawing / drawing through thinking. By the implementation of freehand drawing in the course, drawing becomes a second nature. It results in a personal design signature of the student, also by describing planting implementation in detail, perspective, view and birds-eye view (Figure 1 - example of freehand drawing). The digital part of the course teaches students to order and digital visualise in a ground plan, the application of planting or planting design with different technics in dimension and scale (Figure 2 - example of digital visualisation).

2. Planting as Field of Knowledge: Collecting and Ordering the Knowledge of Planting Characteristics

By formulating a planting matrix the student learns to systematically order gained knowledge and characteristics on planting in five spatial units: trees, shrubs, hedges, perennials and bulbs. The system of the planting matrix is an orderings frame in which leaf & crown; flowering period, habitus (soil/groundwater), structure, dimension, seasonal dynamics during a year, and the concentration of plants are being brought together in a clarifying planting table (Figure 3-planting matrix). To get to know the planting characteristics, it requires to compose unique references of applications where the practice of the specie on a specific place is being known. In search for the above mentioned references, students are asked to draw and photograph the application of planting in their own environment and in two botanical gardens at Wageningen. In the second year students on landscape architecture realise their own personal planting matrix (the planting top 100) in which the classified is judged by preparedness and possibilities for application. This planting matrix is the start of a unique collection of planting knowledge, which will be elaborated during their study and the professional work after finishing the study.

3. Planting Through a Year (the Four Seasons)/Seasonal Aspects

Planting as living organism manifests itself through the year by the four seasons. Every season has its own atmosphere and appearance for planting. During the course students will learn to think on space and time by visualising the planting plan through the seasons. This helps the students to gain more insight in the seasonal dynamics of planting. They learn to perceive the highlights of the seasonal experience, to observe the continuous planting-structures (trees, hedges, shrubs) and to name the variable (bulbs) and most dynamic elements (perennials).

4. Planting & Context of the Location

The application of planting as a pillar for the design requires understanding of the context and location. In the field of landscape architecture, the environment as context is always present. Students are trained to perceive, observe, design and visualise the horizon of the design. This horizon is the border of the location and the place where the (estate) design is connected in the landscape and manifests itself. In designing these horizons, students are trained to use planting as a tool and to think about the effect of this tool.



FIGURE 6. The drawing sketches show the strong development in perceiving.

Deepening of the Design Through the Planting Design

The planting concept does not stand alone but is the elaboration of the overall design. By the selection of species and the chosen combination of plants, the expressiveness of the design is created. Students learn to develop their planting concept by the aimed design intervention: which mood/atmosphere do you want to express, what scale should be used, what is the effect of the planting on the desired space, how is it possible to define the aesthetically peaks during the season? The planting concept will be tested in visualisations, cross-sections and a ground-plan.

Conditions of the Location

Students learn to do research on the local conditions in order to be able to create a promising planting selection. For a successful planting design, the local conditions are the important criteria for selection.

Results

Perceiving

The drawing sketches show the strong development in perceiving of the students. Drawing starts with observing, analysing of structures, contrast, form and proportion, the effect of light and characteristics, capturing in a sketch.

Sketch-studies are about details, objects, places and landscapes. The motive of sketching is: observing becomes perceiving.

Knowledge Development

The result of the study for the planting matrix is the fact that it is possible to define that students are able to systematically order and elaborate their knowledge on planting. The matrix is a memory tool to order the knowledge on planting by characteristics and seasonal qualities. Therefore the matrix becomes an image memory for specific landscapes.

Planting Design

The planting designs of the students show how students become more elegant and specific in their choices and application of planting. During course the competence on creating a collection is developed. In the second course it is possible to see that the ability to visualise and communicate the planting design is increased. The work is more specific on the concept.

The work of the second course also shows that students are able to differentiate the aesthetically and convincing species, size of the group and link this directly at the planting design.

Section

The section and ground-plan shows the structure of the design, the scale and effect of the planting. In course one the sections are schematic in course two the species are shown.

Seasonal

The visuals on the seasonal aspects are specifically used to communicate the content of the planting design. In course one this is schematic, in course two specific seasonal images are visualised.

Context

Designing means becoming aware of the context, location. The students learn to become aware of the impact of their design, by the creation of bird-eye perspectives and sections of the design. They also need to carefully design the border of the location in order to learn to implement the design in its environment.

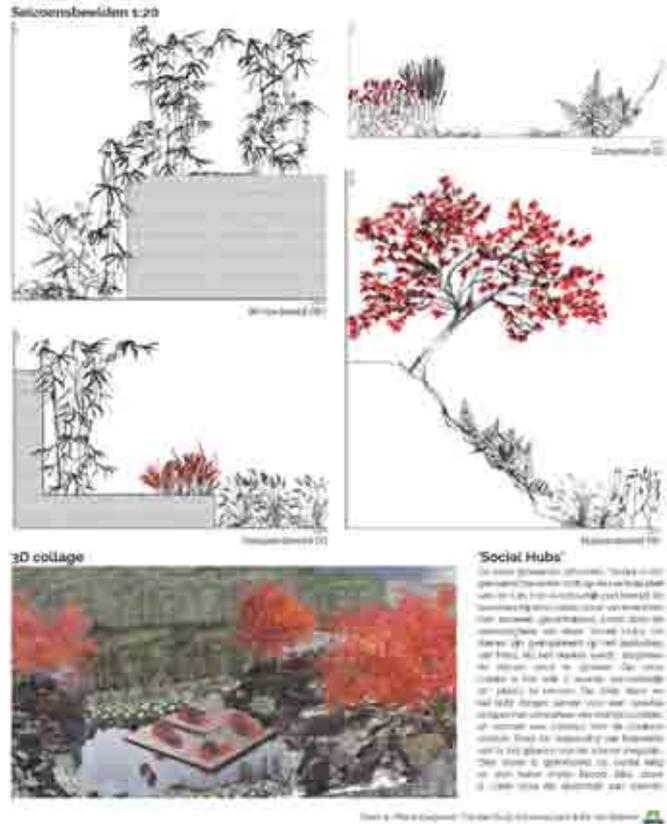


FIGURE 7. The drawing sketches show the strong development in perceiving

FIGURE 8. The section and ground-plan shows the structure of the design

Conclusion

The conditions for a good and sustainable landscape design are specified by the use of plants and its characteristics. Planting design in landscape architecture is the poetical scenery on which the play of landscape architecture is played. It is therefore that the writers of the article are claiming that designing with plants is the artistically refining of a landscape design and is therefore an art on itself which need to be thoroughly taught to understand the art of planting in design.

The course Planting Construction and Representation I & II has the learning goals: the development of a systematically ordered knowledge of planting and the basic skills in visualising and representation of a planting design by the appliance of all sorts of species. The development of the perceptivity of the students is realised by sketch studies: looking becomes perceiving. The planting design is the refining of the total design. By training students in designing with plants, students get experience in the appliance of their knowledge and skills in planting design. In both courses a solid base is elaborated to develop a personal signature and artistic expression in designing with plants. The method of learning (interaction between data/design/observation/sketching/references/seasonal aspects) is the basic fundament for designing with plants. In the results of this learning method the students work reflecting their progress in making poetic landscapes, based on their experience of design with plants.

References

- Designe, M. "Intermediate Natures", Birkhauser, Basel 2009.
- Hobhouse, P. & Harpur, J. "Penelope Hobhouse's Natural Planting", Henry Holt & Co; 1 Amer ed edition, 1997.
- Hunt, John Dixon, "Garden and Grove: The Italian Renaissance Garden in the English Imagination, 1600–1750", London, Dent; London and Philadelphia, 1986; 1996.
- Kloet, J., van der, "Garten-Design/Tuinen van nu", Forte Groen, 2014.
- Moore, K, "Overlooking the Visual: Demystifying the Art of Design", Abingdon and New York: Routledge, 2010.
- Oudolf, P. & Kingsbury, N. "Landscapes in Landscapes", The Monacelli Press, 2011.
- Oudolf, P. & Kingsbury, N. "Designing with plants", Conran, 2009.
- Vogt, G. "Miniature and Panorama", Lars Müller Publishers, 2006.

Playful and Active Research-Based Learning in Planting Design?

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designing with plants | plant knowledge | digital technologies |
playful learning | research-based learning | gamification

Designing with plants is an important part of the education in landscape architecture. For the majority of students acquiring plant knowledge appears to be very challenging. This paper discusses new ways of teaching plant knowledge and the importance of new digital technologies in teaching and learning. Would it be possible to motivate students by using tools they are already familiar with and feel comfortable to use: the digital network? How can continuous learning outcomes be achieved? Could digital support help to get students working closer with real plants?

Problem

The trend of using e-learning as a teaching tool is now rapidly expanding into education. Although e-learning is very popular, there is minimal research on these kinds of learning environments. For the majority of students of the landscape architecture acquiring plant knowledge appears to be very challenging. Would it be possible to motivate students to learn plant knowledge by using tools they are already familiar with and feel comfortable to use: the digital network? Could digital support help to get students working closer with real plants? In the following, three teaching methods introducing playful learning of species knowledge, developed at the HSWT in cooperation with the TUM, will be presented, these methods are supported by a plant app as a learning device and have been introduced and successfully tested in teaching at our universities.

Design Process and Use of Plants

Designing with plants has to be seen in a broader context – teaching in landscape architecture aims for a combination of conceptual knowledge (creative- artistic thinking) and detailed plant knowledge (specific and practical thinking). Different parts of the brain are involved, switching between creative phases with a freely associative, highly cross-linked mindset and (concrete) practical / applied phases with a clearly structured and converging way of thinking. "Landscape design encompasses recognizing and enhancing natural conditions" defined Karl Plomin (Plomin 1977: 165).

Hence, the ability to "read" a site and its conditions including the existing vegetation is crucial as it informs the entire design process and the decision to which extend the proposal will be responsive to these specific conditions.



FIGURE 1. Identification of plants



FIGURE 2. Identification of plants

According to Karl Plomin, 3 important steps are to be distinguished in a successful design process: 1. Topogram: short chart of the most important site conditions (*requires scientific skills and specific knowledge of plants*), 2. Selection of characteristic species and varieties as structural basic modules (*requires specific knowledge of plants*), 3. Overall scenic / pictorial concept (*requires creative thinking*). From today's perspective one additional step could be added: 4. Dynamic development and maintenance plan (*requires specific knowledge of plants*).

Learning Strategies in Planting Design?

Learning is a complex process. A crucial part of the learning process is the ability of remembering and applying information. Learning is more than just the storage of information; it also includes the perception of the learning environment, the link to own experiences and the recognition of rules and patterns. The learning technique of memorizing often ignores a more profound understanding of the inner complexity of the learning contents; therefore, it can only be a first, but still important step in teaching landscape architecture to accumulate plant knowledge. Similar to learning vocabulary, the basis for memorizing is frequent repetition. There are effective learning techniques, such as memory aid (mnemonic, rhyme, scheme or

graphics), Keyword method (abstract and unknown material is converted into easily imaginable pictures) or the Loci method (e.g. memorising by walking across the campus with chains of associations at fixed locations). Generally deep impressions, the conscious and concentrated perception of plants or active experimentation with the newly acquired knowledge about them are the most intense forms of learning. In active teaching often there is not enough time and space to meet this objective. It is important that students continue to learn independently. In this phase, a digital learning technology can be useful to increase the learning motivation and to overcome internal resistances.

In contrast to the professional education of landscape gardeners, landscape architects do not only need to acquire skills in species identification, but also knowledge that goes beyond the individual plant. Landscape architects focus on dynamic systems and the development of plant and plant associations, on competition amongst species, and on stress or disturbance rather than on pictorial planting schemes only. Concerning digital learning support, it must be questioned, both methodically and critically, if the digital learning modules only cover content that can be equally well represented in paper form (script) or whether all the possibilities of interactive

eLearning are utilised. In this context, Reichert and Hartmann coined the term "interpassive learning materials" (Reichert, R.; Hartmann, W. 2004: 1590). Learning through discovering is much more effective than passive looking at information.

Playful and Active Research-Based Learning in Planting Design?

Playing is the most creative way of learning and has the greatest potential for learning motivation. The game is the most original form of learning for humans and all higher developed animals; it is not goal-oriented and leads to self-directed and self-dependent learning. In this form of the learning experience emotions are the most important factor of the memory. The role of humour should also not be underestimated.

In the field of informatics, there are already numerous experiences in using games in teaching and learning. In 2014-15 a collaboration between the University of Applied Sciences Weihenstephan-Triesdorf and the Technical University of Munich/Department of Applied Software Technology developed ideas for a playful teaching and learning methodology.

The team consisted of Prof. Dr. Swantje Duthweiler (head), the students Anet Scherling and Jacob Hüppauff (content conception) both HSWT, and Prof. Bernd Brügge from the TUM supported by the PhD student Barbara Reichart and a team of 12 international Master students (software development).

Learning with the help of game-apps offers students the opportunity to learn anywhere.

The anticipation of using games as learning devices can help to overcome potential barriers and transforms repetition into a positive experience by using reward systems. Serious games can be played in single player mode but are particularly effective if it is possible to establish virtual learning communities and to compete with other teams. It is important to align the app tool with mobile devices and 1:1 computing.

Scenario 1: "Quiz duel app"

As a single- or multiplayer it is possible to learn about plants with playful questions in a form of "quiz duel". Image maps, site conditions, instructions for use and maintenance concepts - everything can be rephrased into exciting questions. The player starts with simple questions and progresses towards a higher level. In the case of wrong answers, questions are repeated frequently. On request, there is also an overall ranking at the end of the course and users can invite selected students for competition. It would be of particular educational value to compile and develop the contents of the app in cooperation with the students / users via an input mask.

Scenario 2: "Geocaching species search"

Students will no longer be confronted with lists of species that they need to learn by heart, but only with the geographical coordinates of plants. These must be found on the university grounds or in urban green spaces. When located QR code based supplementary questions need to be answered. The independent exploration of previously unknown species can

be supported by the additional task for the students to take records and photos of the plant species. These can be uploaded onto a file box, and, as a social component, these files can be shared between multiple users and thus be mutually checked and enhanced.

Scenario 3: "Blended learning"

To support the e-learning it is possible to integrate quiz app-lessons in the educational concept. In this connection there will be several possibilities to combine presence teaching with e-learning. It is possible to enrich a presence teaching with digital exercises, with plant tests with TED-live-polls (e.g. to check the foreknowledge), or teaching with interactive group work. Additionally the pedagogical strategy "Just in time-teaching" (JiTT) can be recommended. It is suitable to give feedback between lecture hall activities and work that students do at home (for example Quiz duel app or geocaching species search).

Outlook

In summary, it can be emphasised that there is a huge potential for eLearning as a support tool in teaching and learning at university level, which has hardly been tapped so far. The main obstacle is the lack of the necessary infrastructure. However, designing with plants requires contact with the real plants which must not be neglected in education. It still remains indispensable for acquiring plant knowledge.

References

- Duthweiler, Swantje, Die Kunst des Pflanzens, in: Gartenpraxis, 7 / 2006.
- Plomin, Karl, Der vollendete Garten, Stuttgart, 1977.
- Reichert, R.; Hartmann, W., On the Learning in E-Learning. In: Proceedings of EDMEDIA 2004: World Conference on Education Multimedia, Hypermedia and Telecommunications. Lugano, Schweiz: AACE, 2004, S. 1590-1595.

A Multi-Method Approach to Teach Planting Design in a Post-Bologna Era

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teaching and learning | landscape units | outdoor sessions | analogic models

The Bologna process reduced teaching contact hours on planting design course units in the Landscape Architecture programs at the University of Porto. Such change called for a different approach, focused on a more active participation of the students in the learning process. This article describes a plant learning and design methodology adopted for the 2nd year in the bachelor of Landscape Architecture at the Faculty of Science, University of Porto. The process develops sequentially as follows: step 1) outdoor sessions in parks and gardens stimulating direct plant identification in close and distant positions; step 2) planting design of a private garden in a residential urban context; and step 3) planting design and analogic model making of a multifaceted park organized in seven prototype landscape units. This approach is refereed on a regular basis by panels of teachers and specialists invited to participate in the assessment sessions. Results show that general competences and the level of knowledge regarding plant design have not decrease with the reduction of contact teaching hours.

Studio: Plants in the Urban Landscape - Additional Challenges with the Bologna Process

Teaching plants in landscape design courses is a demanding and complex task. Plant knowledge requires repetition, patience and persistence, a challenge when dealing with technological driven generations, increasingly dependent on quick answers and outputs. These challenges increased dramatically with the implementation of the Bologna process that forced a rearrangement of the study plans reducing teaching contact hours in the vast majority of the course units (European Commission/EACEA/Eurydice 2015). This also happens on planting design course units in the Landscape Architecture programs of the University of Porto. Such change called for a different approach, focused on a more active participation of the students in the learning process.

This article describes a plant learning and design methodology adopted in the Studio: Plants in the Urban Landscape, a 2nd year Course Unit of the bachelor in Landscape Architecture at the Faculty of Science, University of Porto. The combination of various approaches, intends to capture students' attention on the learning of plants in various spatial contexts, promoting long-lasting skills.

Syllabus and Teaching Methodology

Although having a strong focus on practical classes, the teaching methodology includes theoretical classes to provide students with the fundamental principles of planting design. Syllabus is organized in following main themes: 1. The importance and functions of vegetation in the urban landscape; 2. Main types of green spaces and their incidence in the city of Porto; 3. Vegetation in landscape architecture design: typologies of spatial organization and fundamental units of composition; 4. Raunkiaer physiognomic types and stratification of vegetation; 5. Leading species of trees, shrubs and herbaceous plants for



FIGURE 1. Outdoor sessions in Porto City Park for plant identification.

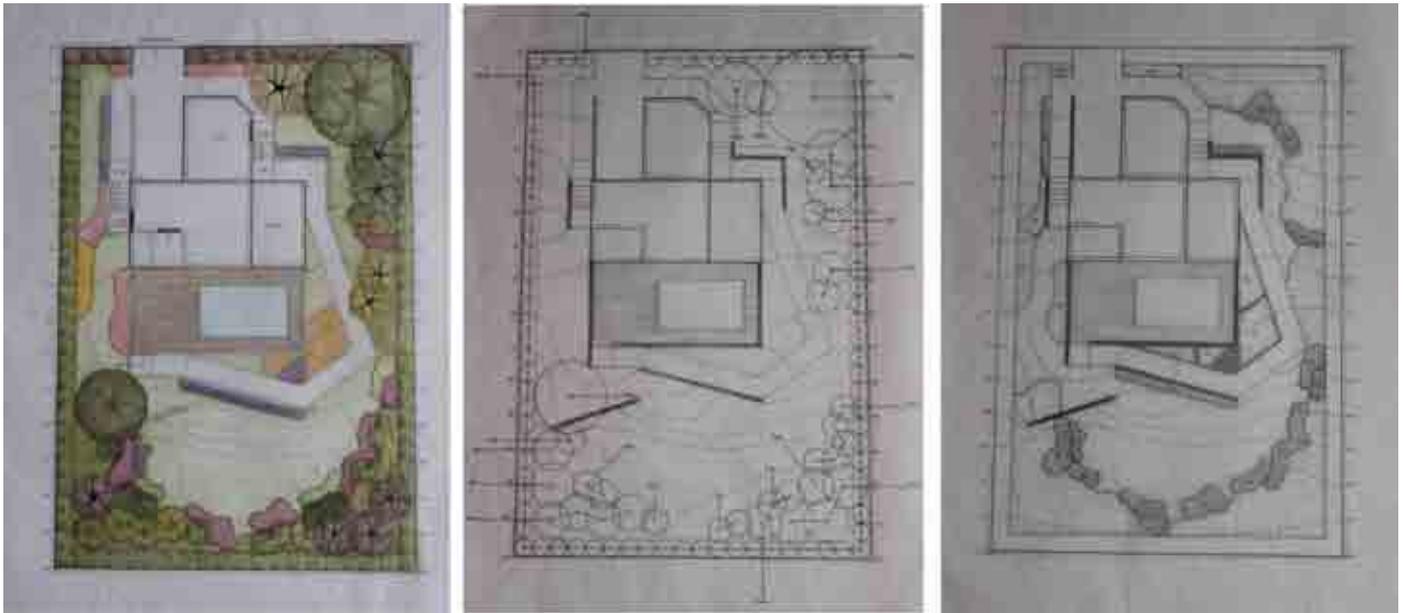


FIGURE 2. Outputs of planting design for a private garden.

interventions in the urban landscape; 6. Preparation and technical representation of planting plans, planting models and planting detailing. These issues are subsequently trained in practical classes in a process that develops sequentially as follows:

Step 1) Outdoor Sessions in Parks and Gardens Stimulating Direct Plant Identification in Close and Distant Positions.

At this stage students are expected to be familiar with the content of earlier plant courses intended to support plant knowledge and identification such as plant biology, plant diversity, ecology and biogeography.

The parks and gardens where the sessions take place are located near the Faculty so, most of the time, the group moves on foot (Figure 1). This peripatetic walk has the advantage of allowing students to record the various manifestations of vegetation in the urban landscape, from the more planned, as the tree-lined streets, to the more spontaneous as ruderal vegetation of vacant

lots. The visited grounds are different for age, function, size, character, etc. enabling a very comprehensive range of options in terms of species identification, floristic combinations and spatial arrangement, also allowing further evaluation of the quality of the planting schemes and observation of different stages of maturation, from recent plantations till stabilized plant communities.

The plants of the gardens, native or exotic, are identified at the species level. Other features are also discussed such as the origin and geographical distribution, soil and climate preferences; growth rate, size, longevity, resistance to limiting factors (shadow, pollution, saltiness), use in planting schemes (hedges, alignments, mixed borders, etc.), aesthetic quality, flowering and/or fruiting season, biodiversity value, and others. During this process time is given to students to draw distinct plants compositions, identifying the species in the drawing and detailing the most important features for their identification. At this stage the assessment is individual and is taken orally in one of the gardens visited.



FIGURE 3. Outputs of the multifaceted park.

Step 2) Planting Design of a Private Garden in a Residential Urban Context.

This is the ideal exercise for testing the knowledge gained in Step 1 and training the first planting schemes, not only because of the comfortable scale, but also because the garden design and grading has been previously studied in 1st year course units. Students are assessed individually and outputs to be delivered include a master plan, a planting plan of trees and shrubs; a planting plan of herbaceous, meadows and lawns; cross sections; visual simulations and planting details ((Figure 2).

Step 3) Planting Design of a Multifaceted Park.

This park is organized according to the glade-edge-wood model, resorting to seven prototype landscape units: lawn, flower meadow, wildlife pond, formal garden, multi-layered border (demonstrative of the edge), open woodland and closed woodland. Each of these units represents different challenges concerning species selection, floristic combinations, spatial arrangement and stratification of vegetation.

Lawn: enables knowledge development on grasses adapted to frequent mowing; short, biodiverse meadows are also exercised. Aesthetic interest and different functionalities are achieved through different mowing heights also anticipating the apprenticeship of creative maintenance strategies.

Flower meadow: allows to test several compositions of flowering species with annual, biannual or long-lived perennial life cycles. Combinations of native and exotic species can be made.

Wildlife pond: focuses on the use of riparian species, representative of all possible layers, settled in a higher to lower gradient of water availability.

Formal garden: it is usually the entrance of the park. A more rigid style is adopted centred on ornamental exotic species, may include species of controlled growth.

Multi-layered border: structured by herbaceous, shrub and tree species with different heights is, for excellence, the unit of biodiversity. It is the ecotone that welcomes species from the glades and from the wood imposing a representation of an increasing stratification and complexity.

Open woodland: the tree layer, covering between 50% and 75% of the area, begins to dominate over lower layers.

Closed woodland: the tree layer exhibits a coverage of more than 75%. Lower layers are simplified and structured by species adapted to shade.

In addition to planting plans, Step 3 relies on analogic model making of each prototype that, executed with a hexagonal shape, enables a diversity of options for the assemblage of the seven units, finally creating the multifaceted park (Figure 3). The assessment of this stage focuses on group work. Once students have developed individual skills can now contribute more consistently for a common solution.

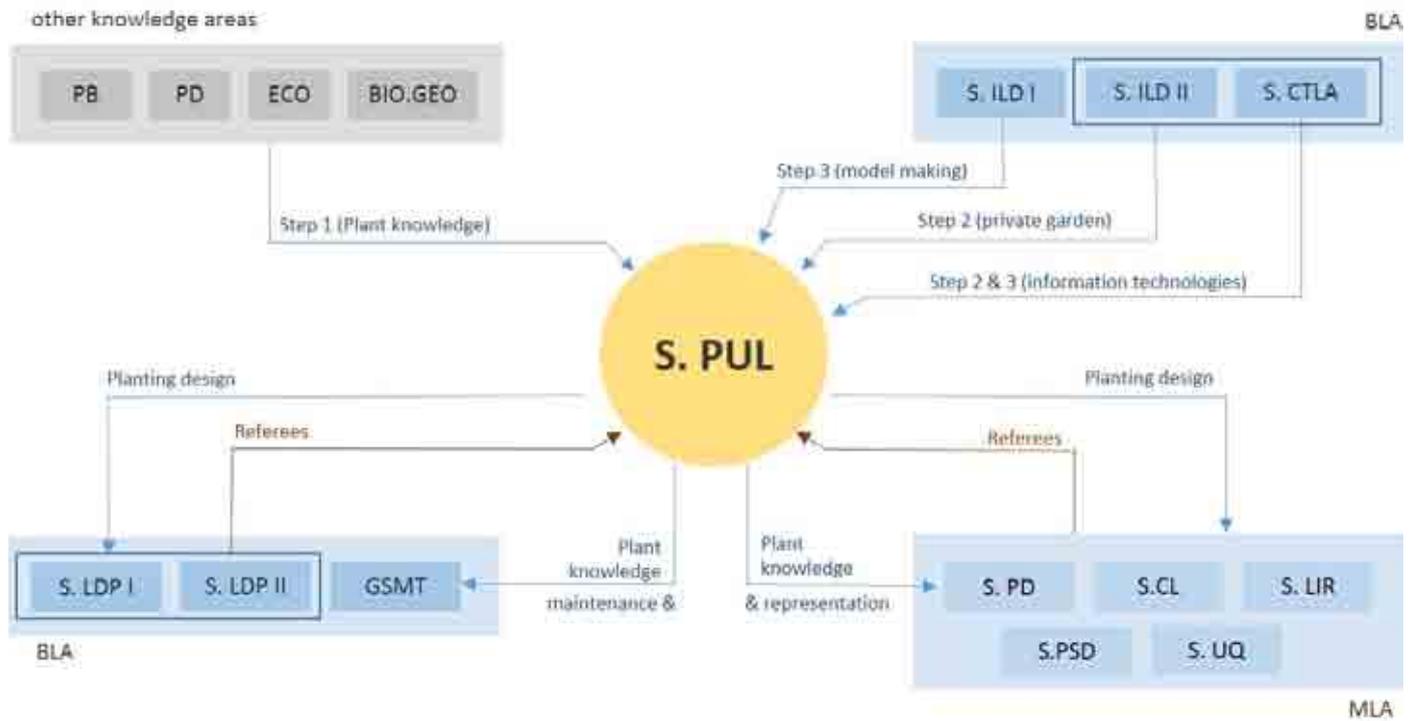


FIGURE 4. Diagram of interrelations between 'Studio-Plants in the Urban Landscape' and other course units of the 1st and 2nd cycles of Landscape Architecture at the Faculty of Sciences, University of Porto. (S.PUL – Studio Plants in the Urban Landscape; S.ILD I and II – Studio. Introduction to Landscape Design; S. CTLA – Studio. Construction Techniques in Landscape Architecture; S. LDP I and II - Studio. Landscape Architecture design Project; GSMT – Green Spaces Maintenance Techniques; S. PD – Studio. Planting Design; S. CL – Studio. Cultural Landscapes; S. LIR – Studio. Landscape Impact and Restoration; S. PSD – Studio. Public Space Design, S. UQ – Studio. Urban Qualification)

Assessment of Results and Reinforcement

The described approach is refereed on a regular basis by panels of teachers and specialists invited to participate in the assessment sessions; they examine students' outputs and give notice of their performance in the course units where planting design is required.

Planting design, like any other form of art is a cumulative and complex process. Knowledge of plants and its uses in Landscape Architecture starts before and extends beyond the horizon of Studio - Plants in the Urban Landscape course unit. Subsequent course units either from the undergraduate or master's degree will enable the deepening of the knowledge acquired. Systematically, students will be faced with new problems requiring solutions within the application and manipulation of vegetation thereby consolidating and expanding knowledge. (Figure 4)

Despite the reduction of contact teaching hours as a result of the Bologna process, this multi-method approach have demonstrated that a more integrative learning process based on active students' participation ensures the maintenance the necessary competences regarding plant design project.

References

- Brittenuum, J. B. 2014. The three P's: Plants, Planting design, and the Professional. Council of Education in Landscape Architecture. Landscape Research Record No. 2. Landscape, City and Community.
- Chen, G. 2011. Landscape Architecture: Planting Design Illustrated. Stephen Delaney. 288 pp. 3th Edition.
- Dunnet, N.; Hitchmough, J. 2004. The dynamic Landscape. Design, Ecology and Management of Naturalistic Urban Planting. Taylor & Francis. 332 pp.
- European Commission/EACEA/Eurydice, 2015. The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union.
- Oudolf, P.; Kingsbury, N. 2013. Planting: A New Perspective. Timber Press. 280 pp.
- Robinson, N. 2011. The Planting Design Handbook. Ashgate Publishing Limited. 287 pp. 2nd Edition.

Experimental Design and Maintenance of FCUP “Wild Garden”: Researching and Learning Urban Nature

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experimental design | urban biodiversity | naturalness |
ecological restoration | ecological succession

The concepts of ecological restoration, wildlife gardens and naturalness are practiced as theoretical or speculative narratives, but less as concrete experiences. They stand for the mitigation of the “human” sprawl, sustainability, biodiversity enhancement, ecological aesthetics, and social inclusion. This is the motivation for an ongoing experiment based on the creation of a “wild garden” in the Faculty of Sciences, University of Porto, Portugal. The space has been intervened with the guidance of an evolving and dynamic design, testing autochthonous materials, natural aesthetics, and “controlled randomness” with a diverse layout. The management strategy adopts natural succession as the main driver of change. Different areas were marked for three types of actions: tree and shrub areas – promotion of ecological succession; tall meadows – occasional interruption of ecological succession; short meadows – regular interruption of ecological succession. With its “dry” and “wet” zones, it allows teachers and students to learn and monitor the dynamics of urban ecosystems, the performance of invasive species, the pulse of natural succession influenced by minimal human intervention, and the confrontation with the attributes of “native” aesthetics.

Introduction

Ecological restoration can be defined as “the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed” (SER 2004). In an urban context, ecological restoration projects face numerous challenges, especially considering that sites have generally been through dramatic and frequent transformations (Handel 2013). Traditional approaches to ecological restoration intend to recreate the original ecosystem, bringing it to an ecological trajectory previous to any human modification. However, even if historic records of former plant communities are available, current urban sites exhibit restraints and limitations that were not acting in the past, such as fragmentation, isolation and reduced area. Moreover, the physical environment is likely to have changed as well, which means different soil, air and water conditions (Handel 2013). To meet modern needs and expectations, the recovery of these sites must consider low maintenance costs, sustainability, high plant diversity, and the support of biodiversity (Dunnet and Hitchmough 2004). These objectives can be achieved through a management programme based on natural ecological succession and planting species adapted to local conditions. Additionally, as urban areas are the focus of our research, the aesthetic dimension should not be undervalued, as sites must be appreciated by the public (Dunnet and Hitchmough 2004).

The concepts of ecological restoration, wildlife gardens and naturalness are very much practiced as theoretical or speculative narratives, but less as concrete experiences. They stand for the mitigation of the “human” sprawl, sustainability, biodiversity enhancement, ecological aesthetics, and social inclusion. It is important to research how plant communities develop in urban sites, created by intentional plantings schemes or spontaneous colonization, with the purpose of creating urban green spaces that fulfil both ecological and social functions.



FIGURE 1. "Wet wild garden", in the northern section.



FIGURE 2. "Dry wild garden", in the southern section.

This is the motivation for an ongoing experiment based on the creation of a "wild garden" around the Administrative and Biology building in the Faculty of Science of the University of Porto (FCUP), Portugal. We hypothesize that the use of spontaneous vegetation succession and dynamics as a central concept in a landscape design project, would result in high levels of ecological diversity and aesthetic appreciation with low maintenance costs.

Implementation of the "Wild Garden"

A former paved car park and a vacant lot were transformed in a set of small green spaces around both buildings, with the "wet wild garden" in the northern part and the "dry wild garden" in the south. The project adopts a minimalistic-naturalistic design, aiming at creating a visible balance between the geometric character (apparent both in buildings and in the design of some vegetated areas) and the natural forms of vegetation. It considers pre-existing vegetation and the reutilization of construction materials, aiming at a management strategy inspired on natural ecological succession.

The installation of the "wet wild garden" (Figure 1) began in the spring of 2009. Two main different areas were conceived: areas to be cut and areas for natural vegetation development. Additional soil material was added and a basic seed mixture for lawns was sown. In the eastern section, narrow borders were punctuated with *Populus alba*, *Populus nigra*, *Fraxinus angustifolia* ssp. *oxycarpa* 'Raywood', *Quercus robur*, *Salix alba* ssp. *vitelina* and *Salix atrocinerea*.

The western section is dominated by an irregular pavement, created with large granite stones reclaimed from demolitions. The pavement is set with large gaps between the stones to allow space for water infiltration and the establishment of vegetation. Small specimens of *Quercus robur* were planted, punctuating the pavement and in small groups edging a clearing. The project salvaged pre-existing *Cupressus lusitanica* trees, considering these specimens in the design.

In the southern part, the "dry wild garden" (Figure 2) was implemented in 2010, based on the same principles. Large granite stones were used to create a path in the middle of a



FIGURE 3. Plan of the “wild garden”, showing the differentiation of zones.

sown meadow, and there was no earthmoving or fertilization. Most of this area was marked as large “no-cut zones”, and the sown meadow vegetation is to be complemented by naturally occurring herbaceous species. Reclaimed materials, such as granite stones and dead tree logs, are used to create visual interest. Besides a pre-existing *Acer negundo*, the tree and shrub community has been gradually enriched with native species (mainly *Quercus suber*, *Pinus pinea*, *Fraxinus angustifolia*, *Populus alba* and *Arbutus unedo*); most of the plants were given, raised or planted by the students, in voluntary sessions or integrated in course units of the landscape architecture master’s and bachelor’s programmes.

Evolution of the “Wild Garden“

The management strategy adopts natural succession as the main driver of change. For the general area, a management scheme was developed, considering three types of spaces and actions (Figure 3): 1) tree and shrub areas, where the ecological succession is promoted (low maintenance/high diversity – weeding of invasive species once a year); 2) tall meadow areas, where the ecological succession is occasionally

interrupted (medium maintenance/high diversity – cut once a year); 3) short meadow areas, where the ecological succession is regularly interrupted (high maintenance/low diversity – mowing once a month).

Thus, in the “wet wild garden”, the small masses and borders of trees and shrubs have minimal maintenance, but are subject to automatic summer sprinkling. Here, tree and shrub patches are not intervened, being currently colonized by spontaneous vegetation. Woody and aggressive invasive herbaceous species are eliminated to allow a more successful development of native species.

The regeneration areas, where natural ecological succession is stimulated, grew progressively in size and complexity along the years, as spontaneous species soon established: *Trifolium repens*, *Mentha suaveolens*, *Daucus carota*, *Digitalis purpurea*, *Calluna vulgaris*, *Ulex europaeus*, *Genista falcata*, *Laurus nobilis* and *Quercus robur* (seedlings appeared in 2013); exotic invasives also occurred, such as *Conyza canadensis*, *Acer negundo*, *Cortaderia selloana* and *Acacia melanoxylon*.

Fauna Surveys	2011	2015
Reptiles	<i>Podarcis bocagei</i>	<i>Podarcis bocagei</i>
Birds	<i>Motacilla alba</i> <i>Parus ater</i> <i>Phoenicurus ochruros</i> <i>Phylloscopus collybita</i> <i>Turdus merula</i>	<i>Columba palumbus</i> <i>Delichon urbicum</i> <i>Motacilla alba</i> <i>Parus ater</i> <i>Passer domesticus</i> <i>Serinus serinus</i> <i>Turdus merula</i>
Butterflies	<i>Pieris brassicae</i>	<i>Colias croceus</i> <i>Lycaenas phlaeas</i> <i>Pararge aegeria</i> <i>Pieris brassicae</i> <i>Pieris napi</i> <i>Pieris rapae</i> <i>Vanessa atalanta</i> <i>Vanessa cardui</i>
Total Species Number	7	16

TABLE 1. Fauna species detected in 2011 and 2015, in the “wild garden”.

In the “dry wild garden”, the area is not watered artificially and most of the herbaceous vegetation is kept as tall meadow patches. This allows a high occurrence of flowering native grasses and other herbaceous plants, increasing its visual impact and strongly attracting wildlife, especially butterflies.

Regarding species diversity, flora and fauna surveys were conducted shortly after the implementation of the “wild garden” (in 2010 for flora and 2011 for fauna) and were repeated in 2015. Considering only tree and shrub species, the survey highlighted the occurrence of 46 species in 2010, including both planted and spontaneous specimens, while in 2015 there were 55 species present. Fauna surveys (reptiles, birds and butterflies) revealed a significant increase in species richness from 2011 (7 species) to 2015 (16 species; Table 1).

Conclusion

The space has been intervened with the guidance of an evolving and dynamic design, which tests a diverse layout, autochthonous materials, natural aesthetics, and “controlled randomness”.

Occupying uninteresting spaces between buildings, without any previous planning or soil improvement, it developed through a mixed approach comprising traditional design and implementation methods, public participation, natural process stimulation, recycle of materials, and minimal maintenance procedures. The maintenance strategy is fundamental to the entire process and is mainly based on extensive mowing of open areas and weeding of invasive exotic species from free developing areas. Our results demonstrate that it is possible to increment biodiversity with a simple, low cost maintenance.

FCUP “wild garden”, with its “dry” and “wet” zones, allows teachers and students of biology and landscape architecture to learn, survey and monitor, with easy access, the dynamics of urban ecosystems, the performance of invasive species, the pulse of natural succession influenced by minimal human intervention, and the confrontation with the attributes of “native” aesthetics, with its bright and dull moments according to seasonal cycles.

References

- Dunnet, N. and Hitchmough, J., eds., 2004. The dynamic landscape: design, ecology and management of naturalistic urban planting. London: Taylor & Francis.
- Handel, S. N., 2013. Ecological restoration foundations to designing habitats in urban areas. In: J. Beardsley, ed. Designing wildlife habitats. Washington, DC: Dumbarton Oaks Research Library.
- SER (Society for Ecological Restoration International Science & Policy Working Group), 2004. The SER International Primer on Ecological Restoration, Version 2. Tucson: Society for Ecological Restoration International.

Hart Island – A New Cultural Dimension Through Ecological Recovery

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ecological repair | burial | cultural consciousness

This paper proposes how damaged ecological systems could be repaired and nature/culture reconciled through the medium of vegetation design.

Hart Island is a potter's field situated in Long Island Sound, New York. Since 1868 one million bodies (stillborn babies, the poor, the unidentified and the unclaimed) from New York City have been buried on the island. The current burial practice consists of communal trenches, excavated on a semi-industrial scale. This results in the extensive destruction and degradation of the land surface.

The authors suggest utilising a mosaic of successional vegetation blocks as an ecological repair mechanism. These structure vegetation at multiple scales dependent on the relative spatial position of the block and its temporal relationship in the burial programme.

This process enhances ecological resilience and acts as a catalyst for future interpretations of commemoration to those buried on the island, returning it to the collective and individual consciousness of New York City.

Introduction

We are proposing place making practices that unfold and generate a dynamic environment. Natural burial, which expresses the cycle of life with growth, decay and renewal lies at the heart of this process. How the landscape reflects this process and 'bridges the gap' of multiple time scales, ecological and cultural constructs is the catalyst for our work on Hart Island.

Hart Island - History

'It [Hart Island] is among the most morbid places on earth. The great moments that shape and scar a nation have passed by this hundred acres..... But the strip of land, barely a mile-and-a-third across at its broadest point, knows better than almost any the biggest moment of all: death, and death of the emptiest kind, hollowed out by anonymity.'

(Michael Ellison, Guardian. June 1999)

In 1868, Hart Island was purchased by New York City and the City Cemetery opened the following year. Mass burials began in 1875 and remain largely unchanged. One million adults, infants and babies are buried in long trenches, three coffins deep and two wide by low risk prisoners from Riker's Island. Approximately 1200 bodies are buried each year. (The Travelling Cloud Museum, The Hart Island Project 2016) Historically there were no graveside visiting rights for relatives. However as from 2015, relatives can apply to visit once a month and have access to the burial sites.

Burial and Landscape

An ecological survey, completed in 1989 identified a number of interrupted and perched ecologies, including closed forest, open woodland, herbaceous meadows in the process of succession to open woodland and salt marsh. Topographically the island is dominated by low lying and undulating topography but also contains low bluffs, riprap, salt marsh and beach interstitial zones.

The siting of graves does not take account of the ecological health of the island or the commemoration process. Existing burial plots are tracked over by heavy equipment to access new sites, causing subsidence and pooling of water. Disinterment after 25 years and reuse of burial plots inhibits ecological rehabilitation. (The Hart Island Project 2016)

Shorelines are susceptible to erosion and rising sea levels and older burial sites lie close to the shoreline with no containment mechanisms to prevent pollution. A recent report (21/01/2016) by the Federal Emergency Management Agency (FEMA), which assessed storm surge damage from Hurricane Sandy in 2012, notes 'Due to the extensive erosion caused by the disaster, multiple bones, certified by the NYC Medical Examiner as human remains, were found exposed throughout the damaged slope.'

Burial and Relatives

Currently mass graves are left open, sometimes for long periods of time and since relatives have now been accorded visiting rights once a month, there are humanitarian and health and safety issues. Those relatives commemorating recently buried adults and babies would almost certainly be standing at or pass by open graves.

The Proposition

The lack of opportunity both physically and emotionally to commemorate the dead removes this landscape from society's acknowledgement, which is difficult to overcome whilst the jurisdiction remains with the Department of Correction. Moves to transfer jurisdiction to the Department of Parks and Recreation have been unsuccessful.

The challenge is therefore to propose solutions, which 'bridge the gap' at a range of scales between existing constrained cultural and debilitated ecological systems. These solutions need to be low cost, work within the existing system with minimum operational modifications and satisfy the enhanced requirements for commemoration in conjunction with the establishment of a diverse ecology.

Tactics

The surface of the island is initially given potential through the designation of 'Locations' for burial and non-burial based on the Ecological Survey and data from the Travelling Cloud Museum database.

'Sites' within a location are nominally 65 x 58 meters, equivalent to the parameters of one year's burial by the DOC. The geometry and size of the site will ultimately be dependent on site condition and existing infrastructure. This site notation has been taken as the key parameter for the introduction of vegetation matrices as it respects existing DOC practice and is of a scale that supports ecological and cultural identity.

The number of 'Blocks' is very much dependent on site size and orientation. The designation of blocks within a site allows for the introduction of woody vegetation at an earlier stage of the medium designation and potentially addresses the issues of burials remaining partially uncovered for extended periods of time. Sites are designated as:

- 'immediate': burial between 0 – 1 years,
- 'medium': burial between 1 – 5 years
- 'long-term': burial 5 – 25 + years.

This process constructs hybrid agencies of succession and plant sociology, which are both culturally and ecologically connected, creating a mosaic of evolving habitats in space and time.

Example: The immediate site would be planted with an annual flower meadow as it signifies that this section will come in to use, within the next year. This annual meadow not only relates to the present time as a singular event, but also can be introduced as a multiple element any time in the sequence as a cover or after more 'long-term' vegetation structures of 5+ years have been removed.

The medium sites are sown with a mix of herbaceous meadow plants, which are adaptable and dynamic and accord to autecology principles of species interaction (Marc-Rajan Köppler, James D. Hitchmough 2015) and the need to create an extended flowering period and a resilient seasonal structure. This typology has a lifespan of 5 years, but can also be introduced at any time within the sequence.

Long-term sites are planted with woody vegetation to develop complexity. In sites, which have up to 20 years undisturbed integrity, a system of rotation coppice and herbaceous ground layer will be implemented. Cycles of rotation become an important cultural measure of the overall burial process as well as providing material for future use in the cultural infrastructure. Post 20 year sites provide the opportunity for the establishment of a woodland type character to maximise habitat diversification through closed and open canopy typologies.

A policy of LTL (Learn to Love) (Davis M 2009) will be adopted for existing vegetation structures, which are designated as unsuitable for burial. The aim of this approach will be to carefully manage and add to the complex system that reflects the evolution of the hybrid ecologies, which have colonised the island.

Conclusions

What results from this approach is a mosaic which evolves spatially and temporally according to the predictive land use set up by the landscape and burial strategy. Through the introduction of these different typologies in conjunction with an enhancement of existing systems (e.g. salt marsh), the island will develop multiple levels of ecological resilience to operational conditions and global changes.

This approach when framed as a cultural phenomena creates opportunities for a potential change in perception. No longer is the islands surface representative of a single monolithic process, but instead introduces notions of beauty and sensory diversity. The relaxation of the visiting rights of relatives, combined with the implementation of the landscape and burial strategy, produces the platform for incremental change. The reprogrammed surface will encourage interaction, with the potential for temporary pathways, places to sit and reflect to create a more civilised process of commemoration. Potentially this could provide opportunities for the prisoners to learn new skills in horticulture and ecology as part of their rehabilitation- another aspect of 'bridging the gap'!

References

- Davis M. *Invasion Biology*. Oxford University Press. 2009. Quoted in JoLA 1-2016. *Designing Dredge: engaging the sediment landscapes of the Great Lakes Basin*. Burkholder. S. Page 12.
- Geuze. A & Buijs. M [http://scenariojournal.com/article/airport-landscape/West 8 Airport Landscape](http://scenariojournal.com/article/airport-landscape/West-8-Airport-Landscape).
- Köppler, M.R. Hitchmough, J.D JoLA 2. 2015 Ecology good, aut-ecology better: improving the sustainability of designed plantings : Schiphol. Scenario 04: Building the Urban Forest. Spring 2014.
- Leopold. A. *The Sand County Almanac and Sketches Here and There*. Pages 177-187. Oxford University Press. 1949.
- Prominski. M. JoLA 1. 2014. *Andscapes: Concepts of nature and culture for landscape architecture in the 'Anthropocene'*.
- Rainer. T. *Planting in a post-wild world: Designing plant communities that evoke nature*. Portland, Oregon. Timber Press. 2015.

The Hart Island Project <https://www.hartisland.net/>
<http://www.theguardian.com/us-news/2015/jun/03/hart-island-new-york-city-mass-burial-graves>

Integrating Agroforestry Practices Within the Springsbury Arboretum

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arboretum | agroforestry | intercropping | productive planting

The concept of an arboretum – a diverse collection of trees – has been applied to a variety of landscapes over the past two hundred years. From the tree plantings of the Derby Arboretum – an 1840s English public park – to the systematic collections of the Arnold Arboretum in Boston, arboreta have great value for education, conservation, and recreation. In addition, many arboreta also fulfill wider economic purposes, especially through plant breeding, producing new tree cultivars.

Given the increased need for and interest in integrating other forms of productive plantings into designed landscapes, such as food forests and agroforestry systems, how might existing temperate arboreta play a more central role in the development of these planting systems?

The author addresses this question through a discussion of a recently completed design of the new Springsbury Arboretum at the Casey Tree Farm in Berryville, Virginia. The Casey Tree Farm is a property of The Casey Tree Foundation, a non-profit organization in Washington, DC, whose mission is to increase the urban tree canopy of Washington. The goal for the Springsbury Arboretum is to create educational plantings adjacent to their nursery, near native woodlands on the farm, and within the existing agricultural landscape. The paper describes how a variety of trees will be integrated into 60 hectares of agricultural land; concluding that the primary design objectives of maintaining the agricultural uses on the land and providing diverse and ecologically sound tree plantings fit well and can be achieved through the application of agroforestry principles.

Introduction

Arboreta are specialized, and usually diverse, collections of trees with educational, conservation, and recreation value. Furthermore, arboreta often experiment with and develop new cultivars of trees, having horticultural, agricultural, and economic importance (Hill 1915). In recent decades, the focus of arboreta in the Northeast United States has shifted away from the latter functions and toward the more passive uses of education, conservation (including the conservation of ecosystems), and recreation.

As the productive uses for arboreta have waned, elsewhere there has been renewed interest in the practices of agroforestry, which has ancient roots, but is young as a subject of scientific and cultural study. Contemporary research in agroforestry suggests five types of practices, including silvopasture, alley cropping (intercropping), forest farming, riparian buffers, and windbreaks (Gold and Hanover 1987), which have been applied in temperate environments around the world in ways tailored to particular cultural needs, and interactions between species.

When asked to design a new arboretum on an existing farm, the author (with co-principal designer Dr. Paul Kelsch, also of Virginia Tech) wondered if trees might be arranged and planted following agroforestry practices in the creation of new tree collections. This paper describes a proposed design for The Springsbury Arboretum at The Casey Tree Farm, which uses the practices of silvopasture, alley cropping, riparian buffers, and windbreaks as key components. The design suggests that it is possible to maintain the agricultural productivity of the land and add a variety of trees, creating an ecologically sound arboretum with educational, conservation, and recreational value, delighting visitors.



FIGURE 1. Randall Lineback cows graze under *Quercus* spp. in upland silvopastures.

An Arboretum for the Casey Tree Farm

The Casey Tree Farm is a 295-hectare property of the Casey Tree Foundation of Washington, DC, whose mission it is “to restore, protect, and enhance the tree canopy of the nation’s capital.” (Casey Tree 2016) Recently, the Casey Tree Foundation decided to establish an arboretum on their farm alongside their existing tree nursery, all of which is about 100 kilometers from Washington, DC, in Virginia’s Shenandoah Valley. The farm stretches along the Shenandoah River at the northern end of the Valley and through much of the 20th century was a thoroughbred horse farm. It was settled in the 18th century, named Springsbury for the clear freshwater springs that issue from the limestone slopes, and has a combination of deep soils along the river for crops and rolling hills for pastures, which are currently let to cows.

About ten miles away from the Casey Tree Farm is the Blandy Experiment Station and the State Arboretum of Virginia. Like most arboreta in the United States, over the past decades, the experimental functions of Blandy have declined. However, Blandy has a very diverse woody plant collection and a set of native conservation meadows that are functional as habitats and enjoyed by visitors. Why then create a neighbouring arboretum? What species might a new arboretum include that would not be redundant? Is a high diversity index a necessity for an arboretum? While arboreta certainly have relevance worldwide for a host of reasons, what could be significant about another near Virginia’s existing arboretum? These are a few of the questions the design team asked when presented with the problem. To respond, the team studied the existing characteristics of the land, its historical and current uses, and saw in the situation the potential to apply agroforestry principles.

Five Agroforestry Practices

Agroforestry practices around the world have been an active area of research for about four decades. In temperate zones, including the Northeast United States, there are five well-recognized ways of combining trees and livestock and/or crops in integrated systems. These include: silvopasture, alley cropping, forest farming, riparian buffers, and windbreaks. Silvopasture joins grazing animals and tree farming, for instance; pine plantations support cattle or sheep graze in orchards. Some species are particularly compatible, for example, in Portugal farmers have raised pigs, cork oaks, and oaks bearing high quality acorns, for generations in mutually supporting relationships. Alley cropping or intercropping is the practice of growing crops between rows of trees. Forest farms are cultivated forests where a particular mix of species is planted or existing populations of plants are nurtured to yield non-timber forest products. Riparian buffers stabilize the banks and floodplains of rivers with vegetation, including trees, while windbreaks and hedges shelter and protect some species and are themselves home for others. While there are numerous variations on these rather broad and well-established types of practices, they served as guiding concepts in the layout of agroforestry plantings for the Springsbury Arboretum.

Integrating Agroforestry into the Arboretum Design

With the Blandy Arboretum as a nearby neighbour, it seemed that striving for a high species diversity planting for Springsbury did not need to be a high priority for the design, as is typical of arboreta. Instead, the diversity built into the proposed collection comes through the types of planting – their configurations and the functions they perform, both practical (agricultural, ecological, educational) and delightful. Much of the land that is currently in pasture will remain as pasture with either clumps of mast (nut) trees (*Quercus*, *Castanea*, *Fagus*, and *Carya* spp.) or pines (*Pinus* spp.) as experiments in



FIGURE 2. When standard sized heritage apple trees reach full size they may function as an example of Streuobst.



FIGURE 3. A farmer mows an intercrop of hay between rows of *Carya illinoensis* and *Juglans nigra* in the floodplain.

silvopasture, using landrace cows of the Randall Lineback type (Figure 1). It may be ten years before many of the trees planted will reach a size where they will be fully integrated with the grazing operations, especially in the case of the heritage apple orchard (Figure 2) near the main house, which will eventually be a fine example of the increasingly rare Streuobst – as grazing under standard sized fruit trees is called in Germany (Herzog 1998). The lowlands of the farm and now arboretum are within the floodplain of the Shenandoah River and have some of the deepest and highest quality soils. Currently these fields are

mown for hay. In the proposal, nut trees – *Juglans nigra* and *Carya illinoensis* are set out in long rows, between alleys of hay that will continue to be mowed (Figure 3), providing winter forage for the cattle. Closest to the river in the riparian zone, *Juglans nigra* and *Populus deltoides* thicken the riparian buffer between the agricultural fields and the river, displaying a third agroforestry practice. Finally, the on the hills above the centre of the arboretum, pines are planted as windbreaks, as can be seen in the overall plan for the 60 hectare arboretum. (Figure 4)



FIGURE 4. The overall Springsbury Arboretum plan shows windbreaks and other agroforestry practices from above.

Conclusion

Considering how to combine agricultural practices with the qualities and functions of an arboretum has yielded a variety of distinctive plantings – for their layouts and the species selected – and generated a plan that is diverse in its collection of interactions between trees, livestock, crops, and people, rather than tree types alone. This designed scenario seems to suggest that the programs of an arboretum and farming are compatible in this context, a hypothesis, which will be better tested when the arboretum is planted and established. The decline in experimental plantings at the Blandy Arboretum and others like it and the rise in interest in testing and applying agroforestry practices in temperate zones suggest that growing combinations of trees, livestock, and crops in an arboretum may be a very useful way to refine practices in the region and educate visitors on their value, harkening back to a couple of the long-standing purposes of arboreta, production and education.

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References

- Casey Tree Foundation Mission Statement, 2016. Retrieved from <http://caseytrees.org/about/mission/> on April 15, 2016.
- Gold, M. A. and Hanover, J.W. , 1987. Agroforestry systems for the temperate zone. *Agroforestry Systems* 5, 109-121.
- Herzog, F., 1998. Streuobst: a traditional agroforestry system as a model for agroforestry development in temperate Europe. *Agroforestry Systems* 42, 61-80.
- Hill, A.W. 1915. The History and Functions of Botanic Gardens. *Annals of the Missouri Botanical Garden*, 2, 185-240.

Urban Tree Concepts in a Changing Climate: A Practical Instrument for Specific Implementation in Swiss Cities

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urban trees | climate change | urban development | street tree management

The ILF has applied its expertise to develop a practical tool for Swiss cities: urban tree concepts for the future - which species are appropriate? The hot summer of 2015 has shown the impact of climate change which focused attention on the need to examine the appropriate use of trees in Switzerland's urban landscape. Municipalities are currently facing the challenge of having to process different research findings related to climate-resilient tree species and then putting them into practice in order to prepare Swiss cities for a warmer future.

Objective:

The Institute for Landscape and Open Space (ILF) has developed and tested a tool which allows users to select the most appropriate tree species for specific urban sites in the future.

The tool is to be applied in Swiss cities and towns and seeks to create a future concept for trees in public spaces in the face of a changing environment. It was developed to recommend specific tree species based on a set of criteria which can be modified to suit individual circumstances. The concept has been applied successfully in Hamburg, Germany, since 2013.

Advantages for towns and local authorities:

ILF helps decision-makers in Swiss towns and local authorities to apply the tool in order to obtain a detailed list of climate-resilient tree species specific to the region. In addition to offering their expertise on functional, strategic and maintenance aspects of trees, ILF provides services in the field of designing urban spaces with trees.

The climatic conditions in cities are changing. This means that we cannot necessarily plant native species. Trees provide shade in cities and can prevent overheating. As well as this green neighbourhoods are popular inner city locations and property prices are evidently higher in them.

The climate in urban areas has changed noticeably in the recent past. Conditions have become dryer and hotter. This creates stress for trees in cities. Selecting suitable trees will be more and more difficult in the future.

Myriad ›climate tree lists‹, from Germany and Austria among others, seek to assist in the selection process. They include tree species that are successful in similar sites in comparable European cities and incorporate first test results of urban tree planting.

Can these lists and findings by our European neighbours simply be applied to the Swiss micro-climatic conditions? A number of experts have set out to find the perfect tree for cities in Switzerland.

What is the Perfect Urban Tree?

The tree should live for at least 100 years, be maintenance-free and clean; it should be attractive in all seasons and healthy, possibly with scented foliage and flowers. It would be ideal if it provided a variety of flora. Many would even prefer a native; and that it would do without soil, nutrients and water...

There is a short range of existing trees in Swiss cities and municipalities. This is mainly due to the structure of public areas which often are limited in size. A large proportion of the roads, mostly the distinct canton roads in smaller municipalities, are often not owned by the local authorities. The municipalities have little direct influence. There are only very few street spaces in public ownership due to their historically evolved structure.



FIGURE 1. *Quercus palustris*, Mönckebergstrasse Hamburg.



FIGURE 2. Shady street on a hot summer day in Bonn, Germany.

Distinctive trees are often on private land where the local authorities have no access, therefore the professional selection and development of urban trees is difficult in such situations.

How is it Decided?

The approach used for the selection of trees, differs remarkably between various authorities, as their method weighs the requirements differently.

Usually trees are selected by the cities' specialised institutions and, if required, by a small circle of tree officers. However then the following generations of people working in open space departments are often left to wonder what made them choose these trees.

Civil engineering and transport departments stipulate the amount of space available for tree planting above and below the ground. The open space departments lack convincing arguments to question these stipulations. However, both groups of officers are generally out of their depth when it comes to creating atmospheric urban spaces.

The requirements for trees in cities are changing continuously. Budgets change too, as well as the available plant sizes and maintenance facilities. Moreover, species are affected by pests and diseases as a result of climate change.

In summary, these points spell out that concepts for cities or local authorities should not be static. The goal is to generate a selection key according to relevant parameters in order to adopt a list of specific tree species for each city.

Consequently, alongside issues concerning requirements the questions asked by the responsible officers rarely vary: what species shall I plant, what size and where? The IFL offers the right tool to answer all of these questions.

What Trees Should be Considered?

The IFL at the Hochschule Rapperswil has the competence to help.

They have the skill to assess and document the distribution of tree species. This is done using area calculations of tree species in Switzerland and illustrated using geographical information systems.

The assessment of existing trees in urban areas provides information on which species are reliable and will do well in future. Proposals for a single species or cultivar of street trees are only made if they will be implemented in the near future. The risk of using large numbers of a single tree species or cultivar is that disease could destroy them in one fell swoop and lead to the loss of significant avenues or whole tree populations in a neighbourhood.

One way to avoid this risk is to group together different trees with similar design qualities. These groups provide a base for selection. Accordingly the tulip tree, tupelo and maple, all with maple-like foliage, are assembled in the maple group. Ornamental cherries, ornamental apples and rowan are in the group of ornamental fruit trees. The maple group is appropriate for more prominent street trees, whereas the ornamental fruit trees are mainly intended for residential streets. If a specific tree such as the ornamental apple tree can no longer be planted because of cases of fire blight in the region, another tree species within the same group is chosen and will provide the functional and aesthetic qualities which had been previously defined. These groups of trees can be composed by the ILF, the HSR or by local experts - and our team will be happy to assist.

The groups of trees are periodically reviewed by panels of tree experts, designers and the responsible authorities. The composition of the panels resembles a democratic system which will avoid conflict within the local authorities. All are involved and a consensus is reached.

Method

A decision grid makes the selection of trees for particular sites easy to comprehend.

First Step

Streets are classified according to categories commonly used in road planning such as traffic loads and functions within the city. The categories contain information about the approximate width and required clear height in typical cross-sections.

The next stage is to define the design category. For example the design approach to a town hall or church will be more prominent than for a residential street where children might

play. Also a matter for consideration is the requirement of biodiversity which has to be incorporated in an appropriate way. Special historic and conservation issues as well as the proposals from competitions and development projects must be considered and integrated. This can only be supported by the ILF, the HSR and to some extent by the Archives for Swiss Landscape Architecture.

Second Step

- The layout of trees in the street space are defined to meet the functional and design requirements.
- The group of trees for each street is defined.
- The tree genus, species and cultivar as well as the exact quality is specified.
- The conditioning and habit of the trees are specified. For example whether fastigate trees should be pruned and at what intervals.
- The execution of planting is considered; the tree pits and construction details are specified.

A site for a street tree is often anticipated for 100 years, whereas property developers might intend the life of adjacent new builds to be only 80 years. This calls for a different approach: 'tree planting with a time limit'.

The cost of a tree in a street space for 100 years is immense. Perhaps our aspirations should be reduced and space made available for trees on sites that are not prepared to the highest standards. Such planting of carefully selected species would increase the opportunities for additional trees in our cities.

References

- Böll, S. et al.: Stadtbäume im Zeichen des Klimawandels - Projekt Stadtgrün 2021. Bayerische Landesanstalt für Weinbau und Gartenbau Abteilung Landespflege (Hrsg.), 2013.
- Forschungsgesellschaft für Strassen- und Verkehrswesen FGSV (Hrsg.): RAST 06 - Richtlinien für die Anlage von Stadtstrassen. Korrigierter Nachdruck 2008. FGSV Verlag, Köln, 2008.
- HÖSTER, H. R.: Baumpflege und Baumschutz. Ulmer Verlag, Stuttgart, 1993. KÖRBER, K.: Gedanken zur Gehölzverwendung im Klimawandel. Veitshöchheim 2010.
- KRÜSSMANN, G.: Handbuch der Laubgehölze. Verlag Paul Parey, Berlin, 1976.
- MADER, G. und NEUBERT-MADER, L.: Bäume. Gestaltungsmittel in Garten, Landschaft und Städtebau. Deutsche Verlags-Anstalt, Stuttgart, 1996.
- POPPEndIEK, H. et al. (Hrsg.): Der Hamburger Pflanzenatlas. Dölling und Galitz Verlag, Hamburg, 2011.
- REIDENBACH, G.: Die Großen unter den Kleinen - empfehlenswerte Kleinbäume für öffentliches Grün und Hausgärten. Lehr- und Versuchsanstalt Gartenbau Erfurt (Hrsg.), 2013.
- RICHTER, G.: Handbuch Stadtgrün, Landschaftsarchitektur im städtischen Baum. BLV Verlagsgesellschaft, München, 1981.
- ROLOFF, A., BÄRTELS, A.: Gehölze: Bestimmung, Herkunft und Lebensbereiche, Eigenschaften und Verwendung. Ulmer Verlag, Stuttgart, 1996.
- Schönfeld, P.: Bäume mit und ohne Mykorrhiza - Ergebnisse eines fünfjährigen Versuchs. Bayerische Landesanstalt für Weinbau und Gartenbau Abteilung Landespflege (Hrsg.), 2013.
- WARDA, H.-D.: Das große Buch der Garten- und Landschaftsgehölze. Bruns Pflanzen Export GmbH (Hrsg.), 2001.
- GALK-LiSte Straßenbäume, Stand Juli 2006. Straßenbaumliste - Empfohlene Baumarten. Grün Stadt Zürich, Stand November 2004.
- Fördergesellschaft "Grün ist Leben" Baumschulen mbH (Hrsg.): BdB Handbuch Wildgehölze. Eigenverlag, Pinneberg, 1992.
- FLL-Empfehlungen für Baumpflanzungen, Teil 1: Planung, Pflanzarbeiten, Pflege, 2005.
- FLL-Empfehlungen für Baumpflanzungen, Teil 2: Standortvorbereitungen für Neupflanzungen, 2010.
- FLL-ZTV Baumpflege, Ausgabe 2006.
- FLL-Gütebestimmungen für Baumschulpflanzen, Ausgabe 2004.

Opportunities and Risks Using Exotic Species in Planting Design – How Should We Present Non-Native Plants Within Teaching?

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planting design | neophytes | invasive species

From earliest days of gardening, plants have been introduced from foreign countries. By chance some of these plants became established permanently in their new surroundings. Horticultural fugitives are often highly appreciated and can contribute to enrich floral biodiversity. But mostly they are seen as unwelcome invaders. Therefore the Rio Convention does oblige the countries to prevent introduction and control or eradicate aliens. But only a small percentage of invasive species are supposed to cause damages in natural biodiversity. Nevertheless there is a heated debate. We must make students of landscape architecture aware of and prepare them for the ongoing discussion. There are valid arguments for the use of non-native plants. They also create opportunities to fulfil future needs.

Use of Exotic Species in Garden Art

From the earliest days of gardening, plants have been introduced from foreign countries. Progress in agriculture, horticulture and pharmacy has always been connected to the importation of new plants, their cultivation and the breeding of new cultivars. Landscape architects have also long used these novel plants to show natural richness, create exotic atmospheres or invent new images. Loudon suggested that “exotic trees should be introduced instead of those common to the surrounding country” (1850: 452) to distinguish works of arts from being a copy of nature. Exotic and rare plants have also served as important status symbols. In the Renaissance, royalty tried to outmatch each other by collecting as many lemon trees and other Mediterranean plants as possible. Since the late 18th century, plant hunters have been sent out to find unknown species for European gardens (Musgrave et al. 1999, Fry 2013). Diversity and richness of vegetation have been highly valued in garden design.

By chance some of these introduced plants became established in their new surroundings. In some cases, they survived the decline of a historic garden and now represent one of the remnants of that period (Nath 1990). We call them *Stinsenpflanzen* (Bakker 1986) or Zeiger alter Gartenkultur (Kowarik 1998: 156) (see Table 1). Because they are often very showy, especially when they build a splendid spring display as many geophytes can do, they are now greatly appreciated by the public and even by nature conservationists. Some of the plants that have survived are heritage cultivars (*Ganthus nivalis* 'Pleniflora') and therefore are a part of cultural biodiversity (see Table 1).

Name	Colour	Display of bigger populations *** very showy, ** showy, * less showy	Origin (according to Euro+Med PlantBase 2016)
<i>Anemone apennina</i>	White – blue	***	Southern Europe
<i>Lactuca macrophylla</i>	Blue	**	Eastern Europe, Caucasus
<i>Crocus</i> spp.	White – blue – yellow	***	Mainly southern and South-eastern Europe and Asia Minor
<i>Eranthis hyemalis</i>	Yellow	***	South-eastern Europe
<i>Fallopia japonica</i>	White	*	Far East Asia
<i>Fallopia sachalinensis</i>	White	*	Far East Asia
<i>Hepatica transsylvanica</i>	Blue	*	South-eastern Europe
<i>Heracleum mantegazzianum</i>	White	**	Caucasus
<i>Omphalodes verna</i>	Blue	**	South-eastern Europe
<i>Ornithogalum boucheanum</i>	White	**	South-eastern Europe, Caucasus
<i>Ornithogalum nutans</i>	White	**	South-eastern Europe, Minor Asia
<i>Pentaglottis sempervirens</i>	Blue	*	Western Europe
<i>Scilla bifolia</i>	Blue	***	Europe, not northern and eastern parts; Asia Minor
<i>Scilla siberica</i>	Blue	***	Eastern Europe, Asia Minor
<i>Telekia speciosa</i>	Yellow	**	South-eastern Europe, Asia Minor
<i>Tulipa sylvestris</i>	Yellow	***	Western, Southern and Eastern Europe, Asia Minor, North Africa

Some *Stinsenpflanzen* are native to Central Europe, but rare in nature and now often found in parks and gardens: i.e.

Corydalis cava, *Corydalis solida*, *Doronicum pardalianches*, *Galanthus nivalis*, *Ornithogalum umbellatum*

TABLE 1. Non-native *Stinsenpflanzen* in Parks of Central Europe and their Display.

Gardeners have always worked to establish and care for their plants as well as possible so that they can survive in their new surroundings for a long time. Nowadays planting designers seek to go further and create sustainable plant communities (Köppler & Hitchmough 2015). Ideally, the planted combination should be able to react to challenges with “resilience” – as Hansen (1993) described it. Resilience includes the processes of reproduction and succession and means that new plants become fully established in their destination area. Of course they should not go beyond and naturalize outside the borders – a run along all the edges.

William Robinson suggested such a process-based approach back in 1870, when he published his book *The Wild Garden*, whose subtitle, *The Naturalization ... of Hardy Exotic Plants*, made his objective unambiguously clear. He recommended 604 non-woody species to be planted in England for that reason. Since then, 231 of them have become neophytes (Kühn 2005). Some might argue that Britain continues to suffer from the consequences of that approach. On the other hand, the biodiversity of the British islands is far greater than it otherwise would be. A total of 1,254 plant species are native to the British Isles (Thomas et al. 2004) – the addition of 231 more means an increase in biodiversity of 18.4%. In the last 70 years, six native species (0.4%) have been lost (Thomas et al. 2004), but no extinction of a native species due to being outcompeted by an invader has been documented (Stace 1997).

Certainly these facts may not be generalized. But they do show that in a country of low biota diversity like Britain, horticultural fugitives tend to enrich floral biodiversity – and not decrease it.

Nativeness and Nationalism

Most ecologists see it differently – they see non-native plants as a looming threat. They don't think of exotic plants as part of a local biodiversity and include only the native ones (Manchester & Bullock 200, Thomas 2004 et al.). “Invasion scientists became increasingly predisposed against non-natives not because they originated elsewhere, but because the probability of negative impact by non-natives is far greater than for natives and because the frequency of invasions has increased exponentially” (Simberloff et al. 2013).

The idea of native/indigenous or not in botany is a product of novel 19th century ideas of phytogeography. Humboldt and his followers created a survey of worldwide vegetation and made it possible for the first time to distinguish among different floras (Browne, Janet: History of Biogeography). Together with the emergence of nation states, a deeper understanding evolved of what is domestic or alien. What was first intended as a scientific description became a concrete postulation: “use only native plants!” There are protagonists throughout the countries of Europe (Alwin Seifert) and the USA (Jens Jensen) who favoured the use of native vegetation in design as a means to create a national identity.

<i>Level of exoticism</i>	<i>Examples</i>
Cultivar of a native plant	<i>Galanthus nivalis</i> 'Pleniflora' and all kinds of turf grasses, which are composed of cultivars adapted for cutting
Native plant, but of a cultivated genotype different from the native one (often different subspecies or varieties)	Most native plants, sold by trade and nurseries, distributed without certification of origin
Native plant, but not native to a given area of a country	<i>Acer opalus</i> in Brandenburg (native to Germany, but only one region in the southwest)
Native but now extinct	<i>Calendula arvensis</i> in Germany
Not native to a certain country but from an adjacent range	<i>Tilia tomentosa</i> in Germany (native distribution begins in Hungary and extends to the Balkans and Asia Minor)
Not native and present far from its native range	<i>Davidia involucreata</i> (native to China)

TABLE 2. Different Levels of Exoticism.

Loss of biodiversity was first recognized as a problem in the western world during the 1970s, although the first publication about invaders dates back to 1958 (C.S. Elton: The ecology of invasions by animals and plants). Enormous efforts have been made in the struggle against the potential “Global Extinction Crisis” (Thomas et al 2004), culminating in the Rio Convention on Biodiversity (1992) and subsequent conferences. In Rio, biological diversity was defined as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems” (Rio Convention on Biological Diversity 1993: 3). Although in this definition there is no difference between alien and native or natural and cultural biodiversity, the Rio Convention does oblige the countries to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species” (6). There is thus a duty to act against organisms which might have a negative impact on natural systems.

The Rio Convention operates with a very static understanding of environment: there are natural systems – and these are threatened and in danger of being lost. The challenge for scientists is to determine whether the introduction of a given species will have any impact – a challenge which is far from trivial (Heger et al. 2013) (see Table 2). One could also interpret the message of Rio more simply because within it there is an implicit judgement: the natural system is threatened by aliens.

Invasive Garden Escapees Threaten Biological Diversity

The Rio Convention on Biodiversity strengthened the focus on conservation of native biodiversity. Gardening was identified as one of the greatest risks for introducing new invaders. And indeed there is some evidence that problematic plants derive from garden escapes (*Solidago canadensis*, *Impatiens glandulifera*, *Heracleum mantegazzianum*).

Potential impacts of non-native plants on biodiversity include the following (Manchester & Bullock 2000):

- Reduction in native diversity
- Competition with native plants
- Hybridization
- Transformation of soil and stream qualities
- Homogenization of regional floral characteristics

Possible impacts on humans (Kowarik 2010: 401ff) include the following:

- Allergic reactions
- Economic damage
- Spread of diseases and pests

Public Debate about Control of Invasive Plants

Among ecologists, the issue of invasive plants is controversial. National and European legislation is being developed that offers legal guidance for measuring damage based on scientific standards. But there has also been significant interest from the general public. Reichard and White (2001) identified an increasing number of non-scientific articles about biological invasions starting in the 1970s in the US. Emerging conservative thinking extending to xenophobia in Europe has led to misleading simplification on the subject and also to emotional rejection.

Arguing for the Use of Exotic Species

At the moment, there is a heated debate regarding the use of exotic species. We must make students of landscape architecture aware of and prepare them for the ongoing discussion. It is important to point out that there are valid arguments for the use of non-native plants and that exotic also create opportunities to fulfil future needs:

- Conservation of cultivars as a contribution to biological diversity
- Preservation of cultural heritage and garden art
- Advantages of foreign plants in planting design
- Recognition of change as a main characteristic of natural systems
- Need for heat- and stress-tolerant species with respect to global warming

The discussion must be led actively from the perspective of landscape architecture, allowing our long history in this field and our understanding of the objective qualities of non-native plants to guide the conversation in the use of non-native plants. Gardeners and landscapers need to identify explicitly threatening plants.

References

- Bakker, P.A., 1986: Erhaltung von Stinsenpflanzen (Zwiebel- und Knollengewächse an alten Burgen). Schriftenreihe d. Stiftung zum Schutz gefährdeter Pflanzen 4, 105-116.
- Elton, C.S., 1958: The ecology of invasions by animals and plants. Chicago: Univ. of Chicago Press.
- Fry, C., 2013: The Plant Hunters: The Adventures of the World's Greatest Botanical Explorers. Chicago: Univ. of Chicago Press.
- Hansen, R., Stahl, F., 1993: Perennial and their garden habitats. 4. Edition. Portland: Timber Press.
- Kowarik, I., 2003: Biologische Invasionen. Neophyten und Neozoon in Mitteleuropa. Stuttgart: Verlag Eugen Ulmer.
- Kowarik, I., 1998: Historische Gärten und Parkanlagen als Gegenstand eine Denkmallorientierten Naturschutzes. In: Kowarik, I., Schmidt, E. & Sigel, B. (Hrsg.), 1998: Naturschutz und Denkmalpflege. Zürich: vdf Hochschulverlag, 111-139.
- Kowarik, I., 2005: Urban Ornamentals Escaped from Cultivation. In: Gressel, J. (Ed.): Corp Ferality and Vonunteerism. Boca Raton: CRC Press, 97-121.
- Köppler, M.-R., Hitchmough, J., 2015: Ecology good, aut-ecology better; improving the sustainability of designed plantings. Journal of Landscape Architecture (2015/2), 44-53.
- Loudon, J. C., 1850: An Encyclopedia of Gardening; Comprising the Theory and Praxis of Horticulture, Floriculture, Arboriculture and Landscape Gardening. London: Longman, Brown, Green and Longmans.
- Manchester, S. J., Bullock J. M., 2000: The impacts of non-native species on UK biodiversity and the ectiveness of control. Journal of Applied Ecology (37), 845-864.
- Musgrave, T., Gardner, C., Musgrave, W.: 1999: The Plant Hunters: Two Hundred Years of Discovery and Adventure Around the World. London: Ward Lock Ltd.
- Nath, M., 1990: Historische Pflanzenverwendung in Landschaftsgärten. Auswertung für den Artenschutz. Worms: Wernersche Verlagsgesellschaft.
- Reichard, S. H., White, P., 2001: Horticulture as a Pathway of Invasive Plant Introductions in the United States. BioScience 51/2, 103-113.
- Simberloff, D., Martin, J.-L., Genovesi, P., Maris, V., Wardle, D. A., Aronson, J., Courchamp, F., Galil, B., Garcí'a-Berthou, E., Pascal, M., Pyšek, P., Sousa, R., Tabacchi, E., Vilà, Montserrat, 2013: Impacts of biological invasions: what's what and the way forward. Trends in Ecology & Evolution January 2013, Vol. 28, No. 1: 58-66.
- Stace, C., 1997: New Flora of the British Isles. Cambridge: Cambridge University Press.
- Thomas, J. A., Telfer, M. G., Roy, D. B., Preston, C. D., Greenwood, J. J. D., Asher, J., Fox, R., Clarke, R. T., Lawton, J. H. 2004: Comparative Losses of British Butterflies, Birds, and Plants and the Global Extinction Crisis. Science Vol. 303, Issue 5665, 1879-1881.

Garden of Retirement Dementia, Katharina-von-Bora-Haus – International Ulmer Prize 2013

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planting design | dementia | sensuality | convalescence | therapy

The task was to design open spaces along the buildings of an institution for dementia patients. The concept is based on a target-orientated effect of plants in open spaces.

Poetically and aesthetically the project is represented by the additional resources of watercolour, which not only sensitizes the viewer's first glance, but also manifests the attitude of the project statement for planting design for this garden, impressively considering all previously settled knowledge and approaches for the planning of gardens for dementia patients and convalescents. Specifically, these are values such as safety and security, which are to create an intimate setting. This reinforces their self-confidence; they can communicate knowledge and create seasonal orientation. The garden creates simultaneously the greatest possible safety potential. This applies to the excitation and stimulation of the senses and prevents monotony. The garden encourages communication, socializing, walks, exercise and therapy at the same time.

The special value of the work can be seen in its generalizable role model effect for teaching with regard to the method of applied planting design in open spaces along buildings with special, sociocultural purpose. It ideally fulfilled the wanted criteria "to enhance the quality of the open space by an imaginative planting design".

Project "Planting Design" (Prof. Cornelia Müller)

Open space planting design is the characteristic empowerment that is quite rightly expected from landscape architects. Both the correct functional usage as well as the aesthetic-artistic access is to be conveyed as an equally-weighted unit. Within the framework of the bachelor's programme, the University of Applied Sciences Osnabrück for Agricultural Sciences and Landscape Architecture (A+L), Department Open Space Planning, offers the module (Project 'Planting Design') for aspiring landscape architects in the 5th semester. This builds and is based on the preceding modules, and has the purpose of acquiring knowledge on plants and their use. Following the successful participation in this module, the students have a broadly-based knowledge regarding the contents, presentation format, task and fields of application of greening designs and the planting plans derived from these, as well as the costs incurred during implementation. Within the framework of the module, this work was submitted for the Ulmer Prize 2013 and awarded 1st prize by the Karl-Foerster foundation.

International Ulmer Prize 2013

"Garden of retirement dementia", Katharina-von-Bora-Haus, Osnabrueck

The students' task was to design a garden for the inhabitants of the Katharina-von-Bora-Haus in Osnabrück.

The stationary nursing home offers residential space for senior citizens and inhabitants who are in need of care and suffer from dementia.

The Katharina-von-Bora-Haus directly borders on the citizens' park, offering a view across the city. The location harbours a special potential for designing the outer areas of the house and turns the nursing home into an island surrounded by green.



FIGURE 1. Site plan and plant examples

Design

Objectives in the design:

- Accessibility
- Elaboration and differentiation of the rehabilitation and dementia garden.
- Bringing the children and inhabitants together.
- Integration of the citizens' park
- Dispensing with additional motifs, concentration on the key needs of the inhabitants.
- The generation of transitions from residential buildings to the park by means of intensive and extensive areas.
- Synthesis of cottage and farm gardens as well as the interlinking to the citizens' park.
- New interpretation

The three space typologies in their symbiosis are to represent the beauty and benefits of a farm garden and evoke memories of past experiences made in gardens. Following up on this, the cottage garden with its attributes of surprise and complexity should contribute variety. The reference to the style of the English landscape park in the citizens' park is to be harmoniously incorporated in its surrounding. Intensively created areas at the house are connected with smaller design accents petering out toward the citizens' park. Apart from the complexity in experience, the architectural formulation and adjustment of the design to the building has the purpose of creating clarity and simplicity in the spatial orientation via the reference to the spatial axis. The modern interpretation, characterised, e.g. by the adjustment to the spatial axes, the more relaxed selection of plants and the clarity in design, leads

to a minimalist design language that classifies the three spatial typologies in a contemporary overall context.

Design in Space

Via the axial adjustment of the space as well as by means of the spacious lawn areas, large trees, lounging areas and a boulevards area, the entrance area is given a park-like character. The facade is concealed by large trees. Apart from the adjacent day care centre, a vegetable patch is suggested as a connecting element, in which both children as well as home residents can cooperate in cultivating, harvesting and looking after vegetables and herbs. Via the connecting path of the vegetable patch, the inner yard and back entrance joins to a new building. The path, surrounded by grasses growing at different heights, opens up toward the new patio, in which a water surface is found. It provides atmospheric support as a safe haven and resting place. In a pergola, leading off from the courtyard, an abode is created that can be used in all weather conditions.

By means of so-called "drifts", i.e. individual greening waves which lead toward the next space, the transition area from the vegetable patch toward the back entrance of the new construction is also created.

On the other side, adjacent to the path and toward the apartment block of the deaconry, a row of fruit-bearing trees, surrounded with a beech hedge, architectonically separates the space.

Here the implementation of the "Farm and Cottage Garden" design theme undergoes a modern interpretation in the form of an intensive plant beds. In this area, those inhabitants who are limited to a greater extent can spend time, communicate and subsequently return to the building in a barrier-free manner.

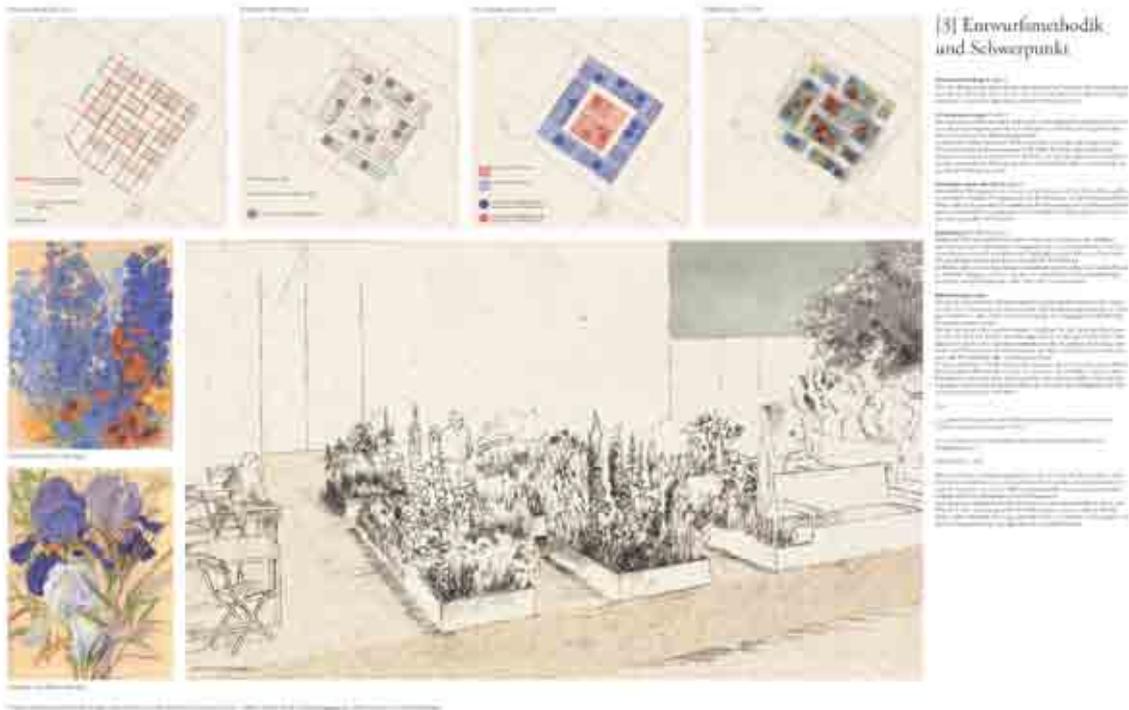


FIGURE 2. Concept plans and perspective of intensive perennial beds

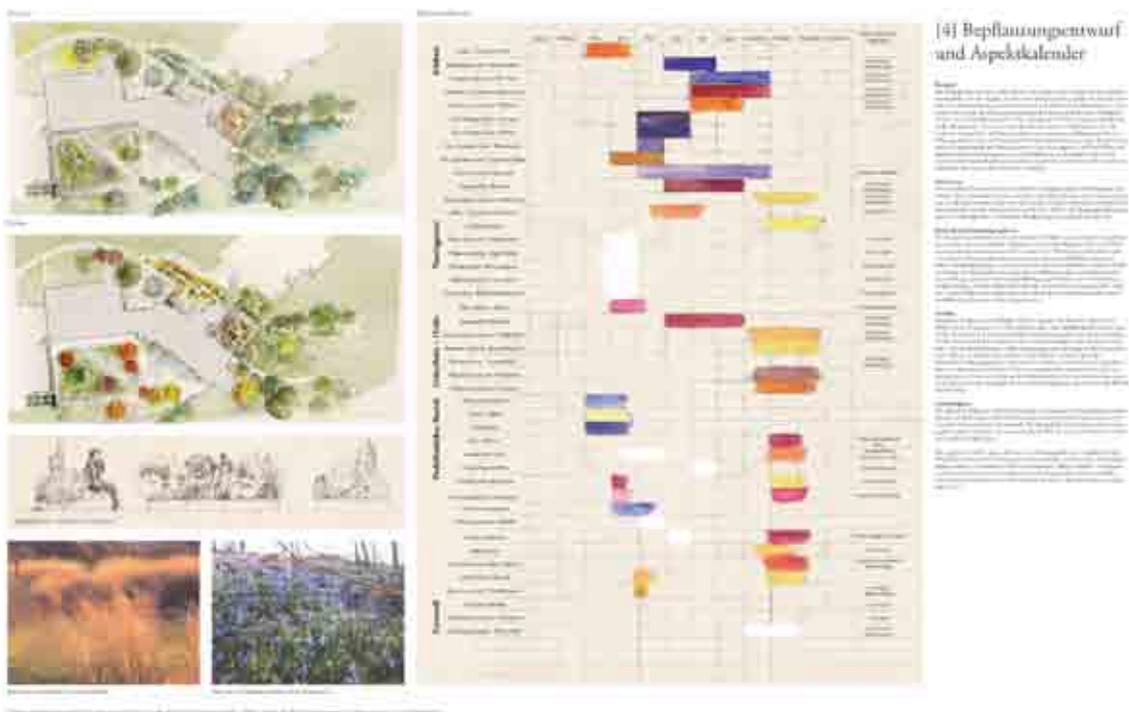


FIGURE 3. Planting aspects

The last periphery of the premises of the Katharina-von-Bora-Haus distinguishes itself with its hilly and forest-like character. Here the design peters out and, only with a few interventions, demonstrates indications of human-characterised usage, in what is else rather unformed vegetation.

The premises and view across Osnabrück can be experienced in motion, from swings hanging down from the trees. The swing forest serves as the furthest away and highest-located retreat from the building, in particular for the youthful inhabitants, who are less severely limited in their mobility and who feel the

need to move in their own space.

Via a barrier-free path, the inhabitants come to a small pavilion, from where they can admire Osnabrück during all weather conditions.



[5] Entwurfsanalyse und Fazit

Entwurfsanalyse und Fazit

Die Entwurfsanalyse zeigt die Entwicklung des Projekts von der ersten Skizze bis zur finalen Planung. Es werden die verschiedenen Phasen des Entwurfsprozesses dargestellt, von der Standortwahl bis zur detaillierten Planung der Grünflächen und Gebäude. Die Analyse zeigt die Herausforderungen bei der Integration von Grünflächen in ein bestehendes Siedlungsgebiet und die Lösungsansätze, die ergriffen wurden. Das Fazit fasst die Ergebnisse der Analyse zusammen und zieht Lehren für zukünftige Projekte.



FIGURE 4. Perspectives of the view to the city and the entrance area.

Design Methodology and Focus

A spatial matrix is created via the reference to the spatial axes, resulting from windows and building corners.

The arrangement ensues in accordance with the principle of the entangled spatial perception, by means of which, due to a change in the visitor's direction there is a change in perspective and, as such, the spaces appear larger.

In this regard, the visitor must swerve to the left or the right after a while so as to be able to continue on the path and get to the centre of the vegetable patches. At every point and patch where there is a change in direction, pausing creates a spatial focal point. This is intensified by the corresponding greening. The colour transition of the iris, from a deep blue up to the red-yellow of the flower pollen then became the guiding theme of the planting for the plant beds. At the paths' turning points, the iris was planted as the main shrub in a variety of different colours in the complete plant bed layout: the colourful basic subject of an outer blue ring, intertwined with an inner yellow-red centre.

The largest and most intensive focal point of greening was consciously placed at the interior of the new construction, because this can also be easily reached by those inhabitants who are greatly limited in their mobility. Here, the wishes of the inhabitants, which became apparent after evaluating the survey, were to be realised.

The total height of the greening is at maximally 1.40m. By means of this, even inhabitants in wheelchairs can gain an overview across the bed layouts, and the visitor relaxing on a bench are surrounded by plant splendour, while the departing visitor finds him- or herself at breast height in an ocean of plants.

Conclusion

In the intensive work process of the group, there were both content-related and essential learning moments within teamwork, which in essence constitute the quality of the work and, among other things, allowed good cooperation.

Regarding content, in the questioning of the inhabitants, it was important for the group to find out how necessary it is to gain a sensitive impression regarding the general daily life of dementia patients. The reduction of design and concentration on the essence would not have been successful without these encounters. Apart from this, testing a design attitude in the greening planning was also important, by means of which the space and plants should come to an architectonic unit.

'Plant Templates' in Garden Design and Planting Plan Teaching

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plant patterns | garden design | native plants | perennials

The aim of the article is to present a new approach to and key in the selection of perennials to designed spaces. We propose to group perennials according to their decorativeness and formal features. Such an approach to the design process will make it possible to employ the same or similar forms and patterns across various environments. Observations and unstructured interviews with garden owners and designers, as well as analyses of the nursery offers, have determined a multitude of separate species and varieties on offer in nurseries and visual similarity of perennials. The results were verified among a group of students. To conclude, it shall be said that it is possible to group perennials into sets, also called „templates”, depended on their forms. These gather plants of similar image: both native and non-native. An ornamental feature conditioning the selection of a plant for the design may have a variety of potentials. Grouping plants into template groups enables their application in a variety of environments and facilitates replacing one. The rules of selection of plants based on plant patterns will encourage designers and producers to treat plants subjectively.

Introduction

Changes of style (e.g. choosing flower colour) in planting design has followed the changes in philosophy and art (Duthweiler 2011). Garden art must follow these changes and account for the fact that nurserymen prefer plants which are easy to grow in a particular environment, and are effective in production. Research of a variety of spaces, landscapes and places, as well as analyses of the social aspects of their development has proven that plants are treated subjectively or, in some cases, with deference (Gawryszewska 2013). It has also been proven that the ornamental value of flowers is of particular worth in highlighting places of importance (Myszka-Stąpór 2014).

Understanding the subjectivity of plants in the relationship between people and garden directed our attention towards the issue of a senseless search for ever newer forms of plants and of a potentially excessive cultivation of ornamental plants while the focus shifts towards ecological and ethical aspects of landscape development. Garden users select particular plants rather than their groups or compositions.

Starting from The wild garden (Robinson 1994) we increasingly often pay attention to the values concerning cultivation of native plants. Noel Kingsbury (2004) analyses values of native and non-native plants. He devotes a lot of space to the search of proper solutions, juxtaposes nature with garden cultural value (plant and art) and refers to the research concerning ecological design. Literature of the topic, since 19th century has offered lists of trees, shrubs and perennials facilitating the design process (Czartoryska 1805, Robinson 1994 (first publ. 1870), Jekyll 1899).

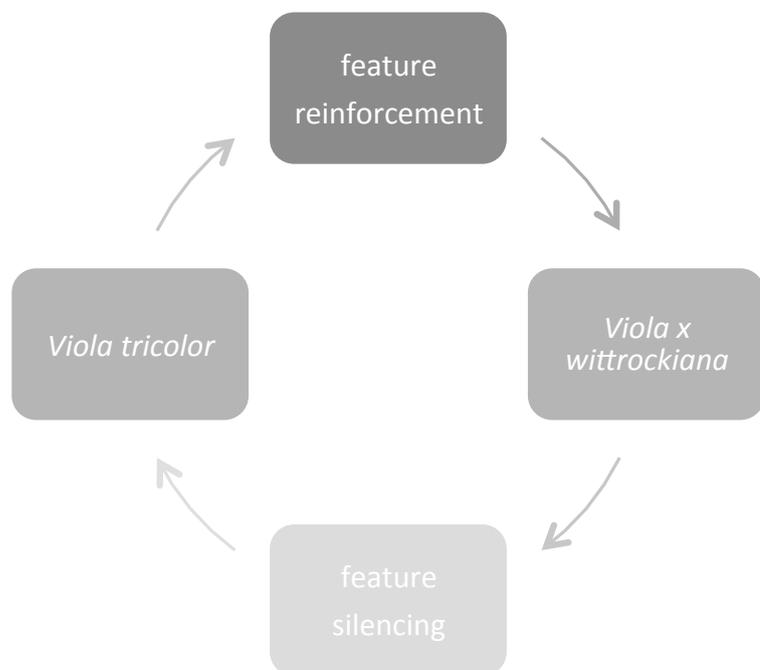


FIGURE 1. Diversification of features of *Viola* genus perennials.

Nonetheless the selection of perennials causes inconvenience to students and designers. Piet Oudolf and Noel Kingsbury (2013) present the recent trends in designing with perennials. They have characterized formal features of perennials (e.g. image encoded in stems, leaves and inflorescence) and shown shape as a more important factor than the colour. The authors refer to studies where the structures of perennials are described (Oudolf, Kingsbury 2013). In our reality the syllabus of design assumes the supremacy of plant's shape over the colour. This can be difficult for students and beginner designers without appropriate treatment schemes.

Front gardens, arranged by the owner or a professional designer, take part in a creation process that shapes aesthetic basis and expectations of the landscape.

Plant design and their selection in regard to forms, independently from the scale of the designed space, is seen by us as one of the crucial aspects of teaching.

Methodology and Materials

The structure of the research consisted of qualitative research: qualitative interviews and observations were made to source information about features of perennials market in nursery production, garden design and gardening practice. The research covered a group of perennials and included an analysis of forms of flowers and plant habits. Unstructured interviews were conducted with garden owners, designers and nurserymen. Garden owners were interviewed about the reasons for their choice and sources of perennials. Designers were interviewed about the key of selection of the perennials for their flowerbeds. Nurserymen were interviewed about the most popular species and varieties. The study covered lists of perennials recommended by nurserymen. Observations included images of recommended perennials in the home gardens, their allotment counterparts, and show gardens in Poland, the Czech

Republic, Belarus, and Lithuania.

The opportunity to apply the perennial pattern in the designed flowerbed was tested on a group of students of a garden design course and thus the results were verified.

Results

The study determined that garden owners collect perennials rather randomly. They do not bother with the name, nor the origin of the plant, but rather fall back on the pre-existing offer and select a pattern. Catalogues of nurseries offered an absurd multitude of species and varieties (one nursery boasted an offer of 2500 cultivars of perennials). A realistic assessment, however, indicates that not all of the listed items are cultivated and available. Interviews with experienced designers revealed that the plants are chosen by habit and environmental requirements. A similarity of perennial forms was observed, unrelated to their botanical affiliation, environment, and requirements. The key to the grouping and designing perennials may be their form – a template: characteristic visual type of plants.

The production of ornamental plants consists in:

- Selection aiming at emphasizing certain ornamental features of native plants naturally present in the landscape or
- At introducing plants imported from exotic landscape in place of the native ones.

In each of these cases cultivation leads to strengthening the ornamental features of the native plant. A vivid example of such a relation is the juxtaposition of *Viola tricolor* with *Viola x wittrockiana*. The comparison shows the type of potentiation of the ornamental feature linked to the forms of flowers of the *Viola* genus. One can almost see the potentiometer intensifying the feature move. It is also possible to imagine the reverse: silencing of the feature observed in plants indigenous to the native landscape.



FIGURE 2. Variety patterns of plants in Lithuanian front garden.

Therefore as the result of research a new perspective was hammered out enabling the method of choosing plants of similar pattern. This approach was further verified in a design task for inexperienced designers e.g. students of landscape architecture. The verification confirmed the assumption that using „plant templates” facilitates designing and streamlines the didactic process.

One example of choosing in line with the plant pattern is the replacement of a demanding (in the Polish and Lithuanian climate) *Lavandula angustifolia* with *Nepeta x faassenii*. Their inflorescence forms are identical, with the pattern of “an ear of little flower with a spherical habit”. Another pattern is a choice between *Myosotis palustris* and *Brunnera macrophylla*: “rosebuds on a carpet”. Similarly, species *Astilbe* and *Filipendula vulgaris*, *Delphinium* and *Digitalis*. Although botanically different, in the eyes of the user their forms are similar. And so, for our garden we look for “stars”, “rosebuds”, “bells”, “daisies” – either individual or in “ears”, “heads” or “plumes” and we wander to have it. Next we select the base: a carpet, pillow, sphere.

The feature which determines the attribution of perennials to a specific model may have a varied intensity. Because of this we should pay attention to the similarity of native plants and their garden equivalents e. g. *Anthemis arvensis* and *Leucanthemum x superbum* or *Tussilago farfara* and *Doronicum orientale*.

Conclusions

The established basis of grouping plants into „templates” is meant to be a starting point towards further divisions indicating the similarity of perennial patterns in minute detail. Templates worked out in subsequent analyses shall facilitate the work of designers and enable suggesting equivalents to nurserymen. Having defined a template, we may seek its visually fitting forms. Grouping plants into patterns enables their application in a variety of environments (as required in practice) and facilitates replacing one – not available in the local market, with its pattern counterpart. The rules of selection of plants based on plant templates will encourage young designers and producers to treat plants subjectively. They will also apply to the postulated, and difficult to implement, introduction of native plants in teaching design and development practices.

References

- Czartoryska, I., 1805. Myśli różne o sposobie zakładania ogrodów. (Various Thoughts on Garden Establishing). Wrocław.
- Duthweiler, S., 2011. Neue Pflanzen für neue Gärten: Entwicklung des Farbsortiments von Stauden und Blumenzwiebeln und ihre Verwendung in Gartenanlagen zwischen 1900 und 1945 in Deutschland (Grüne Reihe), Worms: Wernersche Verlagsgesellschaft.
- Gawryszewska, B.J., 2013. Ogród jako miejsce w krajobrazie zamieszkiwanym. (Garden as a place in dwelling landscape). Warszawa: Wieś Jutra.
- Jekyll, G., 1899. Wood and Garden Notes and Thoughts, Practical and Critical, of a Working Amateur, e-book Gutenberg Library.
- Kingsbury, N., 2004. Contemporary overview of naturalistic planting design. In: N. Dunnett and J. Hitchmough, eds. The Dynamic Landscape. Design, Ecology and Management of Naturalistic Urban Planting, Spon Press Taylor & Francis Group 2004, 81-127.
- Myszka-Stąpór, I., 2014. Elementy ogrodowe. Ich forma, funkcja i znaczenie (Garden elements. Their form, function and meaning), Warszawa: Sztuka ogrodu. Sztuka Krajobrazu.
- Oudolf, P., Kingsbury, N. 2013. Planting. A new perspective. Portland: Timber Press.
- Robinson, W., 1994 (1870). The Wild Garden. Portland: Sagapress.

Natural Planting Design and Public Open Space – Lessons from Applied Research in Lower Austria

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planting design concepts | public open space |
sustainable landscape architecture

Public bodies are increasingly interested in new methods to develop and maintain public open space within a sustainable urban development framework. Current approaches to naturalistic planting design are oriented towards the dependency of plants upon natural habitats and/or the dynamic strategies of a single species. Applied research conducted in the state of Lower Austria tested the concept of “planting and sowing” as a strategy for public open space. Special plant mixtures were assembled based on their aesthetic impact and ecological suitability, and subjected to trial on a range of selected sites demonstrating different habitats. During a three-year monitoring period the establishment of plant communities and the aesthetic impact was documented, while data relevant to management, maintenance and visitor acceptance was collected.

The study suggests that the proposed plant mixtures offer a more ecological and economically worthwhile alternative to traditional ornamental plantings. Successful implementation is dependent on the reduced costs for establishing and maintaining the plantings. Aesthetic quality requires further optimization with respect to visitor acceptance, particularly in regards to certain vegetation periods. Furthermore, the results signal the influence of natural planting design on urban quality of life and point out directions for future research and teaching.

Introduction

Throughout the past few decades, dynamic herbaceous planting design styles have been generated by numerous experts. The models are generally founded upon aesthetic, ecologic and economic principles. Limited resources for public open space make such planting design concepts increasingly interesting for local communities and municipal governments. This paper discusses an applied research project that focuses on establishing and managing a dynamic, naturalistic planting concept for urban open public space in the state of Lower Austria. In addition to outlining and reviewing resource needs for establishing and maintaining the plantings, the acceptance of the general public is also taken into consideration.

In modern planting design practice, Noël Kingsbury was the first who identified a “disparate variety of planting styles” (Kingsbury 2004: 59) that address the correlation of art, nature, native and non-native species. Based on the transition from static to dynamically-driven design, Kingsbury distinguishes between: “Mass planting”, “Informal planting”, “Stylized nature”, “Biotope planting”, and “Habitat Restoration” (Kingsbury 2004: 59). Previous investigations of common plant combinations in Lower Austrian municipalities have revealed that among several dynamic planting concepts, the practice of “planting and sowing” is the most successful when considering optimized ecological and economic values and aesthetic impact (Plenk, Schwingesbauer 2011). This practice integrates herbaceous cultivars into a mixture of native plant seed, and combines strong visual effects of stylized nature with biotope planting, which Kingsbury describes as “a plant community with all the dynamism of wild habitat and clearly resembling natural habitats in terms of its structure, but whose species mix is chosen for an aesthetic effect, as well as their ecological suitability for the conditions at the site (Kingsbury 2004: 60).” The planting and sowing concept has continued to



FIGURE 1. Flowering aspect beginning of June in a meadow-like plant mixture in the centre of a rural community (S.Plenk, 2015)



FIGURE 2. Native goldenrud, wild majoram and carrot emphasize the structural quality of exotic Turkish sage (J.Brocks, 2015)

location	roadside; area 100 m ² ; sea level 162 m; yearly precipitation 533 mm; average temperature 9,8 degree C
soil preparation	replacement of 30 cm existing turf level with a drainage and a gravel-ground soil mix 4:1
sown species	<i>Adonis vernalis</i> <i>Anthemis tinctoria</i> <i>Aster amellus</i> <i>Buphthalmum salicifolium</i> <i>Campanula glomerata</i> <i>Campanula persicifolia</i> <i>Cyanus segetum</i> , syn. <i>Centaurea cyanus</i> <i>Dianthus carthusianorum</i> <i>Erysimum odoratum</i> <i>Euphorbia polychroma</i> <i>Galatella linoxyris</i> , syn. <i>Aster l.</i> <i>Geranium sanguineum</i> <i>Inula ensifolia</i> <i>Linaria vulgaris</i> <i>Linum flavum</i> <i>Malva moschata</i> <i>Origanum vulgare</i> <i>Orlaya grandiflora</i> <i>Pulsatilla grandis</i> <i>Salvia nemorosa</i> <i>Salvia pratensis</i> <i>Salvia sclarea</i> <i>Salvia verticillata</i> <i>Sesleria sadleriana</i> <i>Tanacetum parthenium</i> <i>Teucrium chamaedrys</i> <i>Verbascum chaixii</i> <i>Veronica spicata</i> <i>Viola odorata</i>
planted species	<i>Aster amellus</i> <i>Campanula persicifolia</i> <i>Euphorbia myrsinites</i> <i>Euphorbia polychroma</i> <i>Galatella linoxyris</i> , syn. <i>Aster l.</i> <i>Geranium sanguineum</i> <i>Gypsophila paniculata</i> <i>Iris Barbata Nana-Hybride</i> <i>Lavatera thuringiaca</i> <i>Linum flavum</i> <i>Phlomis tuberosa</i>
bulbs	<i>Allium flavum</i> <i>Allium spaerocephalon</i>

TABLE 1. Example of plant mixture used in the municipality Mannswörth, Lower Austria, Pannonian Plain and Hill Country.

location	roundabout; area 314 m ² ; sea level 362 m; yearly precipitation 1134 mm; average temperature 8,2 degree C
soil preparation	replacement of 10 cm existing turf level with a gravel-ground soil mix 1:2
sown species	<i>Aquilegia vulgaris</i> <i>Astrantia major</i> <i>Betonica officinalis</i> , syn. <i>Stachys officinalis</i> <i>Buphthalmum salicifolium</i> <i>Campanula glomerata</i> <i>Centaurea scabiosa</i> <i>Consolida regalis</i> <i>Cyanus segetum</i> , syn. <i>Centaurea cyanus</i> <i>Daucus carota</i> <i>Digitalis grandiflora</i> <i>Galium verum</i> <i>Geranium pratense</i> <i>Geranium sylvaticum</i> <i>Hypericum perforatum</i> <i>Leucanthemum vulgare</i> , syn. <i>Chrysanthemum leucanthemum</i> <i>Linaria vulgaris</i> <i>Lysimachia punctata</i> <i>Malva alcea</i> <i>Malva sylvestris</i> <i>Origanum vulgare</i> <i>Primula veris</i> <i>Salvia pratensis</i> <i>Solidago vigaurea</i> <i>Tanacetum parthenium</i> <i>Tanacetum vulgare</i> <i>Tragopogon orientalis</i> <i>Veronica teucrium</i> <i>Viola odorata</i>

TABLE 2. Example of plant mixture in the municipality Waidhofen an der Ybbs, Lower Austria, Foothills of the Northern Alps.

guide subsequent applied research work in Lower Austria and provides the basis for the current investigation.

Natürlich Bunt!

For the research project “Natürlich Bunt” (2012-2016), the concept of “planting and sowing” has been regionally adapted, further investigated, and is now being optimized for practical use in Lower Austrian communities. Five sample areas across different municipalities, determined by regional climatic influences, were selected for the project. The sample areas are situated in rural municipalities (Figure 1) and small towns with up to 16,000 inhabitants, and the planting sites are integrated in public squares, parks and roadside green.

Special plant collections were mixed in accordance with plant communities populating local natural habitats such as steppe- and dry meadow-sites, and applied to the selected areas (Table 1 and Table 2). Ecological dissemination, successful establishment and aesthetic impacts of both single species and plant communities were established as the main objectives of a three-year monitoring period completed in 2015. Concurrently data relevant to the management and maintenance was collected (Plenk, Schwingesbauer 2015), and in the first year the acceptance by visitors was investigated (Grilnberger 2014). The tested planting model evokes a relatively meadow-like, colourful and dynamic image created by plant mixtures of between 30 and 60 species and offers a continuous vegetative

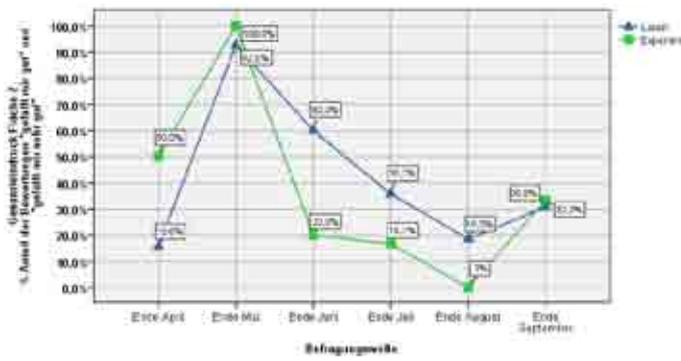


FIGURE 3. Lay persons (Laien) and Experts (Experten) have been evaluating the aesthetical appearance of a plant combination (y-axis) which was established by planting and sowing during the vegetation period (x-axis). Declining acceptance after the flowering season of native species could be stopped and lightly raised again after mowing in July (after Grilnberger 2014: 92).



FIGURE 4. On large planting areas autumn- and winter-effective plants should be provided with sufficient density and parts of them should be excluded while mowing, Waidhofen an der Ybbs (S.Plenk, 2014).

coverage. Emphasis is given to species rich in seed, and the assortment is dependent on local climate conditions. In general, the percentage of grasses is kept very low. The selective use of planted species and sown annuals create an immediate visual appeal during the initial stages of the planting. The ordering and grouping of structural plants determine the visual appearance and when used in higher quantities, elicit the character of an ornamental flower bed. Indigenous species define the plant population, excepting some foreign geophytes, structural plants and autumn-flowering perennials (Figure 2). The plant communities show changes due to the life- and growing-forms of single species. Over time, the diversity and dynamic of the plantings has declined, as evident in natural vegetation development. However, following a period of ten years a more representative and varied impression is to be expected.

Current Results and Discussion

To date, the planting and sowing model can be confirmed as an ecologically worthwhile vegetative alternative for public open space. Successful implementation is dependent on the low costs for establishing and developing the dynamic plant mixtures: the time for maintenance (weeding and cutting) averages less than 5 minutes/person/m²/year. An enduring combination of different herbs and some grasses guarantees an aesthetic appearance with high ecological and economic importance. In terms of succession, the suitable proportion of annuals, biennials and perennials for the mix must be identified. A high percentage of annuals and biennials are important for flowering aspects in the first two years, when people should be won over for the type of planting; at the same time the development and vitality of germinating and growing longer-living perennials should not be inhibited. When adding several annuals in a mixture, rates of up to 3% per species is an adequate amount.

The strongest flowering period of the tested plant mixtures is in late spring and early summer due to the majority of native species included. As soon as the richness of flowers becomes rare, the disadvantage becomes evident as the acceptance by visitors declines due to a lack of colour and visual variety (Figure 3). To reduce this effect, mixtures still have to be

optimized by adding late- flowering non-native species and more species with structural and textural qualities. Additionally, management can influence the aesthetic appearance and therefore the acceptance of the public. The meadow-like vegetation should be cut early enough in the first half of July in order to initiate vital green and a second flowering period. In large planting areas, species with strong autumn- and winter aspects should be included with sufficient density and parts of them should be excluded from mowing (Figure 4). Hence, the overwintering of insects and small mammals is ensured. Moreover, the acceptance of the plant and sow model can be improved upon by introducing the public to the values and aesthetics of dead plant structures and dynamic plantings through education and public outreach. This will encourage a broader understanding of natural planting design.

The implementation and maintenance of the planting model has been successfully managed by the local communities. Brief expert exchanges with the municipal gardening staff three times a year led to satisfactory maintenance results. The key precondition is to provide a suitable substrate and to remove thoroughly the weed contaminated material. Soil exchange was afforded for areas up to 300 m². For larger areas the local municipalities did not spend money on soil exchange, and planting and sowing into uncontrolled topsoil slowly has caused dominance of competitive ruderals during the first three years.

Conclusion: Natural Planting Design into Landscape Architecture!

The examined plant mixtures are not yet optimized and additional years of monitoring are required in order to generate more reliable long-term data on succession and visual change. However, several advantages are evident: planting and sowing is a fast method for establishing a naturalistic aesthetic with wild plants; costs in planning and implementation are comparatively low given the reduced maintenance requirements; additional wide-ranging ecological benefits related to the use of wild species and the reduced maintenance impact are provided. Increasing acceptance of dynamic planting concepts by city councils and the public is mandatory against the background of climatic change and the pressures of urbanization. Using regional wild plants in the urban environment strengthens both local identity and the relationship of inhabitants to the surrounding landscape. Given the wide range of values - social, economic, or ecological - encompassed in the horticultural use of dynamic herbaceous vegetation, integrating natural planting design and landscape architecture in public open spaces can contribute to creating more livable cities.

References

- Grilnberger, J., (2014): Die ästhetische Wirkung naturnaher Staudenpflanzungen mit Ansaat und deren Entwicklung im ersten Jahr. Masterarbeit. Universität für Bodenkultur, Wien.
- Kingsbury, N., (2004): Contemporary overview of naturalistic planting design. In: Dunnett, N., Hitchmough, J., (Eds), (2004): The dynamic landscape. Spon Press, London and New York.
- Plenk, S., Schwingesbauer, S., (2011): Referenzflächen für die Staudenverwendung in Niederösterreich. Forschungsbericht. Universität für Bodenkultur, Wien.
- Plenk, S., Schwingesbauer, S., (2015): Natürlich Bunt: Zwischenbericht zum Forschungsprojekt im Auftrag der Niederösterreichischen Landesregierung. Aktion Natur im Garten, St.Pölten.

Urban Vegetation for Bioretention in Cold Climates – A Short Interval Flooding Test in Finland

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urban vegetation | plant selection | raingarden | storm water | flooding

Bioretention is a method integrating storm water management and vegetation in decentralized solutions in the form of raingardens and swales. Vegetation of a bioretention cell improves water infiltration, but by careful plant selection it can also provide a design element for urban space. In this study a short interval flooding test was conducted to study how urban vegetation can stand these conditions. The selected 15 species had three treatments: a) a control group in good nursery maintenance, b) plants in standing water for 3 days and then 6 days without irrigation and c) plants in standing water for 6 days and then 6 days without irrigation. The cycles were repeated through summer 2015. Plants were measured by size index, shoot and root system dry weight before and after the treatment. Visual features were mapped during the whole experiment. Generally the plants survived surprisingly well in these extreme conditions, and mortality was low. *Sorbaria sorbifolia*, *Syringa vulgaris* and *Acer platanoides* did not stand well the changing conditions. *Geranium macrorrhizum*, *Ribes alpinum* and *Ribes glandulosum* suffered.

Introduction

Recent debate on sustainable storm water management combines qualitative, quantitative and amenity aspects in the urban environment. American Low Impact Development (LID), European Sustainable Urban Drainage System (SUDS) and Australian Water Sensitive Urban Design (WSUD) are all supporting decentralized and multifunctional storm water management (Novotny, Ahern and Brown 2010). Whichever way this new approach is called, it contains an idea of mimicking natural water cycles to prevent urban flooding, to improve local infiltration and to introduce urban design dealing with rain water.

The general characterization of sustainable storm water management practices emphasizes multifunctional water management. One construction is expected to support several processes. Bioretention is a practice combining evapotranspiration, purification, detention and infiltration. These processes are provided by construction of several layers of sands and gravel, living soil and vegetation. Raingardens, bioswales and bioretention cells are based on bioretention. (Roy-Poirier, Champagne, ASCE & Filion 2010).

A bioretention cell collects surface runoff in a shallow, vegetated depression. The ponding area stores and evaporates water, and slowly infiltrates the water into different construction layers and percolates to ground water or, if necessary, conveys additional water to further sites by subsurface drainages. Construction layers filtrate water and remove some of the nutrients and pollutants to improve the quality of storm water. Growing conditions in a bioretention cell alternate between extreme drought and standing water as the drainage layers ensure water extraction, but surface design's purpose is to collect water.

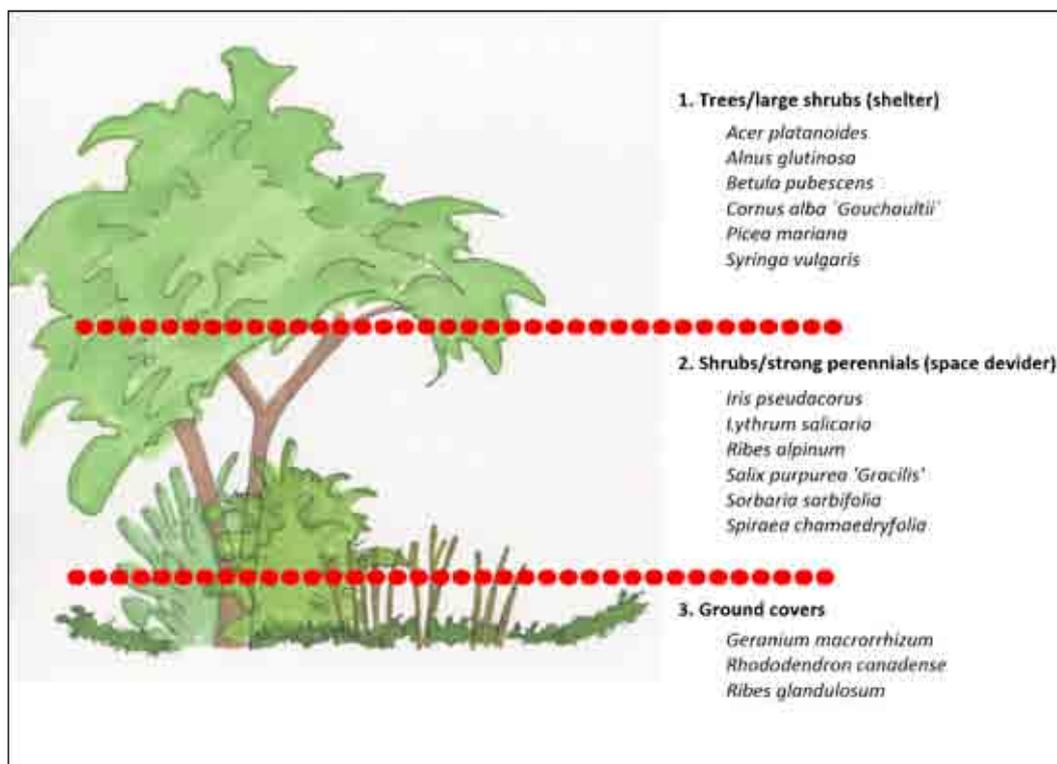


FIGURE 1. Plant selection combined views of local professionals in green industries and balancing between different visual functions that the plant combination may provide.

Vegetation has a clear role in a bioretention cell. Vegetation moves water through evapotranspiration, and is capable of nutrient uptake. The root system supports infiltration by forming macropores in the soil and also provides an environment for invertebrates to further support macropore formation. Vegetation in bioretention cell can provide the same benefits as other urban vegetation does: as architectural and visual element in urban design, and improvement of microclimatic conditions. (Davis, Hunt, Traver & Clar 2009; Hunt, Lord, Loh & Sia 2015).

In cold climate frost, repeated melting, de-icing chemicals and suspended solids in melt water require special attention in bioretention specifications. The type of frost defines the capacity of hydraulic conductivity. If a large grain size is preferred, the frost is granular and hydraulic conductivity remains through the winter, but the structure may dry out during dry weather and vegetation suffers from drought. Then fine grain size supports vegetation in the growing season, but may form concrete frost that both prevents infiltration and breaks roots by freezing water.

This paper aims to clarify what varieties, usually used in a cold climate, cope the conditions of a bioretention cell.

Materials and Methods

The research design follows the idea of short interval flooding test presented by Dylewski, Wright, Tilt and LeBleu (2011) and Jernigan and Wright (2011), where plant species in containers are first in standing water, and then totally without irrigation for certain repeated time periods. This arrangement follows the conditions that are typical in a bioretention cell.

Plant selection was defined in several stages and categorized into three groups: plants that are known to tolerate different moisture conditions, plants that are typically used in built environment, and plants that might tolerate the conditions. Plant species in these categories were commented by partners in Helsinki, Espoo and Vantaa municipalities, by the association of landscape designers and landscape architects in Finland and also by landscape constructors. The final selection (Figure 1) ensured plants for different vegetation layers (groundcovers, small shrubs and large shrubs/small trees).

Experiment plants were pre-cultured in a greenhouse to ensure a strong root system and vital growth before the actual treatment. Root systems were washed and plants replanted in identical soil in 3 litre containers. The preculture phase started 6th of May 2015 and continued until 1st of June, and during this time the plants had good care following typical professional practices in horticulture, such like fertilizing, irrigation and pruning to form uniform and vital plants.

A short interval flooding test was organized outdoors but under shelter. In this arrangement plants faced typical local weather and were adapted to temperature, air humidity and wind conditions. After preculture all experimental plants were placed outdoors and receiving good care for one week before flooding treatment begun. Experimental design followed randomized completed block design with 15 taxa.

Experimental plants were divided into three groups that had different treatments. The first group had good nursery maintenance, the second was under standing water for 3 days and then 6 days totally without irrigation and the last one

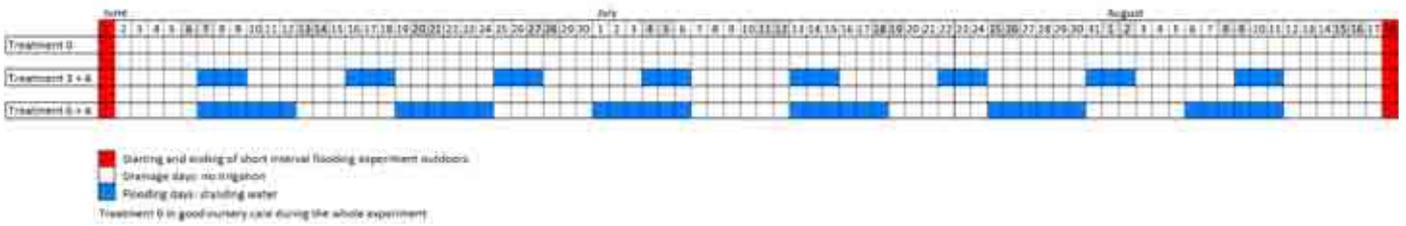


FIGURE 2. Cyclic flooding periods in summer 2015. Good nursery care was provided for all plants during the first outdoor week. Experiment was carried out under a shelter.

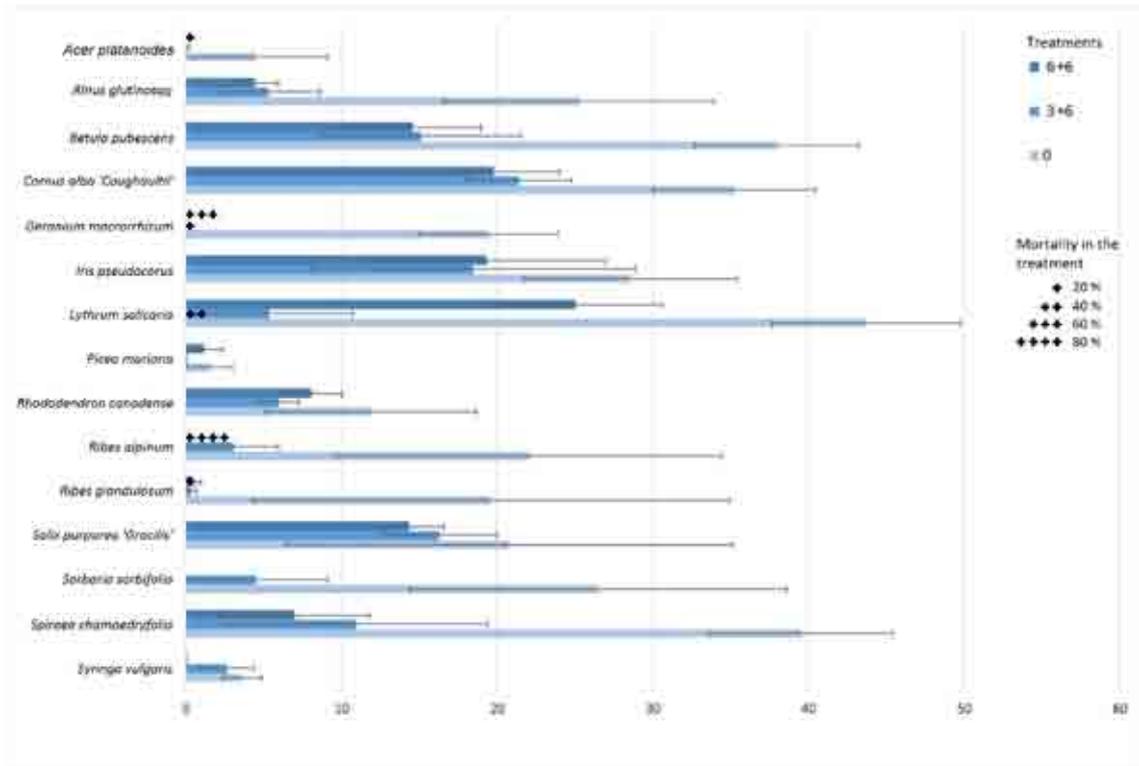


FIGURE 3. The change in SI in different treatments.

was under standing water for 6 days and then 6 days totally without irrigation. There were 15 taxa and 5 plants in every treatment, and edge plants in every block were not included in experimental plants.

Standing water for flooding days was organized by placing the experimental plants in 3 litre containers into 6 litre containers and then adding water to the outer container. The water level was kept at the top of soil surface for the whole flooding period (Figure 2). Water level was monitored once a day. The treatment of good nursery care and edge plants were irrigated as needed.

Experimental plants were measured before and after treatment by size index (SI) [(height + widest width + width perpendicular to widest width) / 3] introduced by Dylewski and others (2011). Also root system and shoot dry weight was measured on 5 plants in every taxa before and from all the plants after the treatment. All plants, both roots and shoots, were photographed at the end of the experiment to provide a possibility for visual comparison between different treatments.

Results and Discussion

Overall mortality was low in this experiment, and it was observed in some plants of *Acer platanoides*, *Geranium macrorrhizum*, *Ribes glandulosum*, *Ribes alpinum* and *Lythrum salicaria*. *Geranium macrorrhizum* and *Acer platanoides* suffered from standing water and *Lythrum salicaria* from long unirrigated periods. The change of visual condition between treatments was found in all species, but it was observed to be clear in *Cornus*, *Spiraea chamaedryfolia*, *Acer*, *Sorbaria sorbifolia*, *Lythrum*, *Geranium*, *Ribes alpinum* and *Ribes glandulosum*. Good visual condition was observed in *Salix*, *Iris pseudocorus*, *Alnus glutinosa*, *Picea mariana*, *Betula pubescens* and *Rhododendron canadense*. Cyclic flooding had no effect on the visual condition in *Alnus glutinosa* and *Iris pseudocorus*.

The changes in SI support visual observations (Figure 3). All plants in the treatment of good nursery care had strong growth, but the differences between good care and the flooding treatments were clear. According to these results flooding effects the SI in two ways. There is decrease of SI between good care and 3+6 treatments that still decrease to 6+6 treatment, or

the lowest SI occur in 3+6 treatment. This finding indicates that plants typically flourishing in wet conditions might not thrive in continually changing conditions. *Ribes*, *Geranium*, *Acer* and *Syringa* are the weakest survivors based on the change in SI. Other species can be considered for bioretention vegetation.

The flooding period of 6 days is exceeding most recommendations of the maximum flooding period. Guidelines often define the maximum time for ponding, but the maximum dry period is of course not known. This requires plant selection that withstands standing water but flourish in more dry conditions.

The planting design of bioretention should include plants in several layers to support efficient evapotranspiration and infiltration through macropores. This experiment introduces some plant varieties of different layers to stand the changing conditions of bioretention in urban context.

This research continues to define proper construction depth and materials of bioretention cells for Finnish practices in 2016.

References

- Davis, A., Hunt, W., Traver, R. & Clar, M. (2009). Bioretention Technology: Overview of Current Practices and Future Needs. *Journal of Environmental Engineering*, 109-117. SpringerOpen.
- Dylewski, K., Wright, A., Tilt, K. & LeBleu, C. (2011). Effects of Short Interval Cyclic Flooding on Growth and Survival of Three Native Shrubs. *HortTechnology*, 21, 461-465.
- Hunt, W., Lord, B., Loh, B. & Sia, A., (2015). Plant Selection for Bioretention Systems and Stormwater Treatment Practices.
- Jernigan, K. & Wright, A. (2011). Effect of Repeated Short Interval Flooding Events on Root and Shoot Growth of Four Landscape Shrub Taxa. *Journal of Environmental Horticulture*, 29, 220-222.
- Novotny, V., Ahern, J. & Brown, P. (2010). *Water centric sustainable communities: planning, retrofitting and building the next urban environment*. Wiley, USA.
- RoyPoirier, A., Champagne, P., ASCE, A.M. & Fillion, Y. (2010). Review of Bioretention System Research and Design: Past, Present and Future. *Journal of Environmental Engineering*, 136, 878-889.

Adaptive Planting Design. Vegetation as Tool to Solve (Existing) Problems

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requalification projects | plant services | beneficial insects |
well-being | maintenance

In green space requalification projects, planting design can become a challenging exercise once the green structure is already consolidated. The focus of this research was to explore the suitability of Adaptive Planting Design to address these questions using the case study from the garden of the Nursing School of Porto, Portugal. In this space three main groups of constraints were identified: 1) a strong attack of aphids in mature trees, 2) incorrect maintenance practices, and 3) an academic community with an emotionally stressful daily life. The methodology included: 1) analysis of scientific literature to assess plants services, 2) elaboration of three lists of plant species to compose three planting pre-plans targeting the mentioned constraints, 3) overlapping those pre-plans to obtain an inclusive planting plan regarding multitasking services provided by plants. The final planting plan is supported on aromatic and flowering species with a restorative effect in people's wellbeing, low maintenance needs, and being attractive to aphid's predators.

Introduction

Requalification Projects – Opportunities and Constraints

Requalification projects arise to solve problems that emerge over the years. These projects have to consider existing elements making it all more challenging once a variety of constraints are expected to be present. This is especially relevant when dealing with a consolidated green structure supported by old mature trees, sometimes already in decline. Approaches to these projects demand for new methods, grounded on planting research.

The focus of this paper was to explore the suitability of Adaptive Planting Design to address these questions once it is based on the assumption that ecological services provided by plants creates more resilient spaces. This concept as its roots on Adaptive Ecological Design (Hunter 2011) follows an approach which combines a technical knowledge of plant performance with visual appeal to create relatively stable and highly decorative plant communities (Oudolf and Kingsbury 2013).

This method was tested in the garden of the Nursing School of Porto by selecting a set of targeted plant species, reflecting about its characteristics and services and developing ways of implementing them in the adaptive planting design process.

The Case Study of the Nursing School of Porto

The Nursing School of Porto is located in Northern Porto in a dynamic urban area, near one of the University Campus and between two major public healthcare facilities. With 2 ha, the garden is therefore used by a diverse community of academics, researchers and patients. (Figure 1)



FIGURE 1. Location of the Nursing School of Porto.

This garden resulted from a well-organized Landscape Architecture project of 1973 and still embraces some remarkable trees. After 40 years, this consolidated green structure is now performing multiple and irreplaceable services but, nevertheless, it is weakened by phytosanitary problems like a strong attack of aphids, especially in *Liriodendron tulipifera* and *Quercus rubra* trees, and an overall maintenance disaster, resulting in an unattractive and unhealthy appearance. Additionally, new opportunities have emerged and although this garden was not initially designed to play a therapeutic role, its strategic location places it as a privileged restorative space for the health related community.

This garden was, thus, in a desperate need for a requalification project and the stated issues claimed for an Adaptive Planting Design Approach. A new planting design, based on plant services, was created preserving existing elements and including new ones to provide specific services: attract aphids' predators ensuring a biological pest control; with low maintenance needs and with restorative effect, to create a refuge garden for this community.

Adaptive Planting Design – Process and Results

The study was developed in the following three steps: 1) analysis of the scientific literature to assess plants services; 2) elaboration of three lists of plant species to compose three planting pre-plans targeting the mentioned constraints; 3) overlapping those pre-plans to obtain an inclusive planting plan regarding multitasking services provided by plants.

1. Analysis of the Scientific Literature to Assess Plants Services

Attract aphids' predators. After the identification of *Illinoia liriodendri* and *Myzocallis walshii*, (Bella 2013) the aphids respectively attacking, *Liriodendron tulipifera* and *Quercus rubra*, there was need to search for beneficial insects to assist in its control (predators) and the plants required to keep a viable population. Literature revealed that ladybugs, lacewings and hoverflies are preferential predators of this aphids. Other aspects were also highlighted: promote plant biodiversity, provide alternative hosts, and ensure a diversity of flowering plants throughout the season to offer nectar and pollen resources and provide shelter and refuge (Alignier et al. 2014).

Low maintenance needs. It is widely known that maintenance requirements can be reduced resorting to native species that additionally promote biodiversity and are more resistant to pests. Ruderal, resistant and rustic species will also decrease maintenance needs. Water consumption can be diminished by using spontaneous meadows instead of demanding lawns and by using ground cover species.

Restorative effect. A restorative environment should provide serenity, space, refuge, as well as contrast between sunny and shady places (Grahn and Stigsdotter 2010). It should also activate people's senses. A garden with healthy live elements transmit to the users' positive stimuli.

Plant species	Family	Native	Exotic	Habit	Foliage	Flowering period	Biocontrol service	Restorative service	Low maintenance service
<i>Anethum graveolens</i>	Apiaceae		X	Annual	-	May - Jul	X	X	X
<i>Centaurea cyanus</i>	Asteraceae		X	Annual	-	Jun - Jul	X		X
<i>Scabiosa atropurpurea</i>	Dipsacaceae	X		Annual	-	Apr - Aug	X		X
<i>Zinnia elegans</i>	Asteraceae		X	Annual	-	Jun - frost	X	X	X
<i>Angelica sylvestris</i>	Apiaceae	X		Biennial	-	Jun - Sep	X	X	X
<i>Calendula officinalis</i>	Asteraceae		X	Biennial	-	Jun - Oct	X	X	X
<i>Hedera hibernica</i>	Araliaceae	X		Climber	EVR	Sep - Oct	X		X
<i>Lonicera periclymenum</i>	Caprifoliaceae	X		Climber	DEC	May - Jun	X	X	X
<i>Achillea millefolium</i>	Asteraceae	X		Perennial	-	May - Aug	X	X	X
<i>Aquilegia vulgaris</i>	Ranunculaceae	X		Perennial	-	Apr - May	X	X	X
<i>Bellis perennis</i>	Asteraceae	X		Perennial	-	Jan - Sep	X	X	X
<i>Echinacea purpurea</i>	Asteraceae		X	Perennial	-	Jul - Aug	X	X	X
<i>Linaria vulgaris</i>	Plantaginaceae		X	Perennial	-	Jun - Oct	X	X	
<i>Monarda didyma</i>	Lamiaceae		X	Perennial	-	Jul - Aug	X	X	X
<i>Rudbeckia fulgida</i>	Asteraceae		X	Perennial	-	Jul - Oct	X	X	X
<i>Choisya ternata</i>	Rutaceae		X	Shrub	EVR	Jun - Oct		X	
<i>Cistus albidus</i>	Cistaceae	X		Shrub	EVR	Mar - May	X	X	X
<i>Forsythia x intermedia</i>	Oleaceae		X	Shrub	DEC	May - Jun		X	
<i>Halimium umbellatum</i>	Cistaceae	X		Shrub	EVR	Mar - May	X		X
<i>Hypericum calycinum</i>	Hypericaceae		X	Shrub	EVR	Jun - Aug		X	X
<i>Leptospermum scoparium</i>	Myrtaceae		X	Shrub	EVR	Apr - Jun		X	
<i>Michelia figo</i>	Magnoliaceae		X	Shrub	EVR	Jun - Sep		X	
<i>Myrtus communis</i>	Myrtaceae	X		Shrub	EVR	Jun - Oct		X	X
<i>Philadelphus coronarius</i>	Hydrangeaceae		X	Shrub	DEC	May - Jun		X	
<i>Rosmarinus officinalis</i>	Lamiaceae	X		Shrub	EVR	Jan - May	X	X	X
<i>Viburnum tinus</i>	Adoxaceae	X		Shrub	EVR	Mar - Apr		X	X
<i>Armeria maritima</i>	Plumbaginaceae	X		Sub-Shrub	EVR	Mar - Aug	X	X	X
<i>Helichrysum italicum</i>	Asteraceae	X		Sub-Shrub	EVR	May - Sep	X	X	X
<i>Lavandula angustifolia</i>	Lamiaceae		X	Sub-Shrub	EVR	Feb - Jul	X	X	X
<i>Thymus caespitosus</i>	Lamiaceae	X		Sub-Shrub	EVR	Jul - Sep	X	X	X
<i>Acer pseudoplatanus</i>	Sapindaceae	X		Tree	DEC	Mar - Apr			X
<i>Betula celtiberica</i>	Betulaceae	X		Tree	DEC	Apr - May		X	X
<i>Magnolia x soulangeana</i>	Magnoliaceae		X	Tree	DEC	Feb - Apr		X	
<i>Pinus pinea</i>	Pinaceae	X		Tree	EVR	Apr - May		X	X
<i>Populus alba</i>	Salicaceae	X		Tree	DEC	Jan - Mar		X	X
<i>Pyrus bourgaeana</i>	Rosaceae	X		Tree	DEC	Mar - May	X	X	X
<i>Quercus robur</i>	Fagaceae	X		Tree	DEC	Apr - May			X
<i>Sorbus aucuparia</i>	Rosaceae	X		Tree	DEC	Jun - Jul	X	X	X
<i>Taxus baccata</i>	Taxaceae	X		Tree	EVR	Mar - Apr		X	X

TABLE 1. List of target species selected to perform each required service.

2. Elaboration of three lists of plant species to compose three planting pre-plans targeting the mentioned constraints

Attract aphids' predators. Species selection came directly from scientific literature that indicates which plants were hosts of the mentioned natural enemies (Gupta et al. 2012). There was a strong incidence of flowering plants, and they were mainly integrated in flowery meadows. The occurrence of trees was almost absent. Some families appear abundantly repeated: Apiaceae (*Anethum graveolens*) and Asteraceae (*Calendula officinalis*). Whenever possible, exotic species were replaced by native species of the same family or gender.

Low maintenance needs. The plant list was based on native (*Arbutus unedo*), rustic (*Westringia fruticosa*), resistant

(*Rosmarinus officinalis*) and ground covering species (*Hedera helix*).

Restorative effect. Selection was grounded on the desirable characteristics stated by literature. Aromatic plants were selected such as *Philadelphus coronarius* and *Helichrysum italicum*. Contrast, texture, movement, shape and colour were also incorporated: contrasting barks (*Prunus serrula*), purple leaves (*Fagus sylvatica 'Purpurea'*), abundant yellow flowers (*Forsythia x intermedia*) and pyramidal trees (*Liquidambar styraciflua*).

Species integrating each pre-plan, thereby representative of this three target services, are listed in Table 1.



FIGURE 2. Planting plan resulting from the overlapping of the three planting pre-plans.

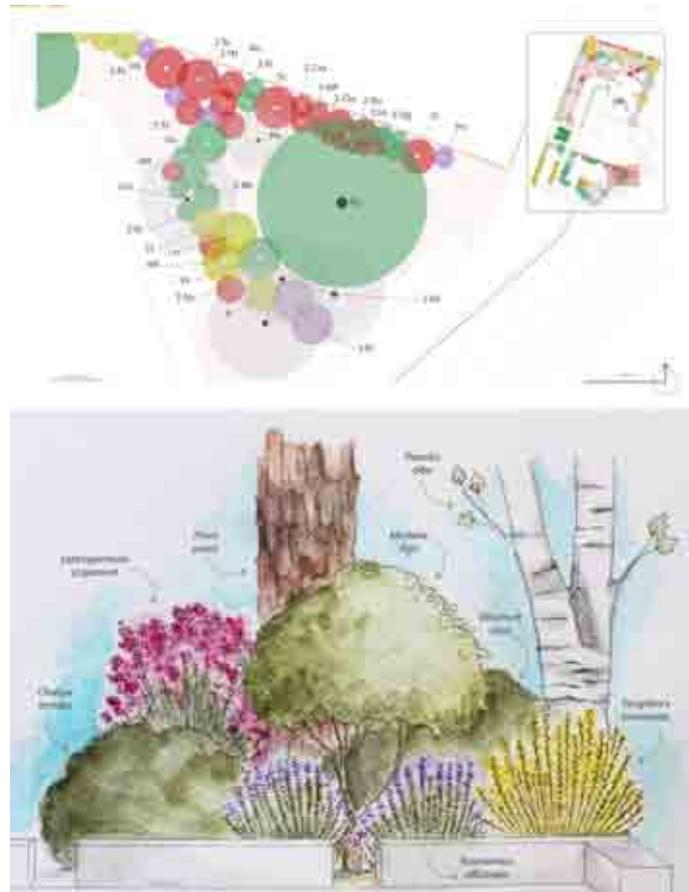


FIGURE 3. Planting plan detail and corresponding illustration.

3. Overlapping Those Pre-Plans to Obtain an Inclusive Planting Plan Regarding Multitasking Services Provided by Plants

As expected the overlapping process allowed to perceive that several species could perform more than one of the targeting services. For instance, flowery meadows used in the first place to promote beneficial insects could as well stimulate users' senses (exuberant flowers, diverse colours and movement) and reduce maintenance needs. In the same way, some of the species with restorative effect and low maintenance needs are also able to attract aphids' predators as they belong to the above mentioned families. Thereby, in the creation of the final planting plan special attention was given to species performing more than one service. The occurrence of different layers and combinations was also ensured as well as a balance between deciduous and evergreen foliage (Figure 2 and Figure 3).

Critical Reflection

In the Garden of the Nursing School of Porto the attack from aphids' was rather high, so initially, it was important to ensure phytosanitary treatments to stabilize pest levels of attack. Meanwhile the proposed new green structure will have time to establish and develop and then it will be essential to monitor the aphids and beneficial insect populations as it will be the ultimate indicator of the success of the adaptive planting design. Results of this monitoring can imply minor changes: species can be replaced by others or moved to more suitable areas of the garden.

The multitasking character of plants was evidenced, still, targeting species must be identified and used to answer to specific problems. Adaptive Planting Design showed ability to support the recovery of mature green structures, as well as to improve space quality and introduce new uses and meanings to a garden. Accordingly, it proved to be a suitable and a versatility tool in green space requalification projects.

References

- Alignier, A., Raymond, L., Deconchat, M., Menozzi, P., Monteil, C., Sarthou, J., Vialatte, A. and Ouin, A., 2014. The effect of semi-natural habitats on aphids and their natural enemies across spatial and temporal scales. *Biological Control*, 77, 76-82.
- Bella, S., 2013. New alien insect pests to Portugal on urban ornamental plants and additional data on recently introduced species, *Annales de la Société entomologique de France (N.S.)*, 49 (4), 374-382.
- Grahn, P. and Stigsdotter, U.K., 2010. The relation between perceived sensory dimensions of urban green space and stress restoration. *Landscape and Urban Planning*, 94, 264-275.
- Gupta, R.K., Srivastava, K. and Bali, K., 2012. An entomophage park to promote natural enemy diversity. *Biocontrol Science and Technology*, 22 (12), 1442-1464.
- Hunter, M., 2011. Using Ecological Theory to Guide Urban Planting Design: An adaptation strategy for climate change. *Landscape Journal*, 30, 2-11.
- Oudolf, P. and Kingsbury, N., 2013. *Planting: A new perspective*. Oregon: Timber Press.

Origins and Contemporary Use of Planting Design in Landscape Architecture

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planting systems | function & use of plantation | tradition & modernity | health

We will investigate different origins of planting design in landscape architecture and how it has influenced the design of gardens, parks and landscapes nowadays. Four domains of origin have been distinguished; agriculture, engineering & architecture, botany, forestry.

Since historical times plants form – together with ground and water – form the classic design materials in landscape architecture. The research question is how planting design evolved over time, what influences it underwent and how it was used in practice? The research method is mainly based on text analysis.

In the introduction we first pay attention to scope, outline and research question. We then start with a short overview of important origins; agriculture, engineering & architecture, botany, forestry. Garden, park and landscape design which made use of the four aforementioned ways of using plants and planting systems, did add the dimension of comfort, pleasure and culture to them.

In the conclusion we develop an overview of planting systems that is used in contemporary planning and design and its origins in earlier times. In today's design projects the concept of health is a key goal for all interventions, plants, plantation and planting design play a major role in achieving this goal.

1. Introduction

The basic design materials in landscape architecture are ground, water, plants. The paper starts to search for the origins of planting design as a basic design material. The core of design in landscape architecture is not only on the use of the planting design but also relating it to ground and water in the context of programme and site.

We approach planting design from different levels of intervention; the materialisation of form, structuring of use and access, strategy for the landscape development in the long run. Planting design is a large subject not only in scope but also geographically, in this paper we focus on Europe and more in particular on Holland. The issue of indigenous or native plantation is not touched upon here.

The research question is: what are the origins of planting design from a historical point of view and what role do they play in contemporary practice?

2. Origins of Planting Design in Landscape Architecture

2.1 The Cultivation of Plants in Agriculture, Horticulture

The first use of plant material is purely functional; the production of food. Since people started to settle after their nomadic existence, the cultivation of plants for food production has increased rapidly; from basic agricultural production like wheat to more advanced forms of horticulture like production of fruits and flowers. A next phase was the production of herbs for medical purposes and the growing of flowers for pleasure. Towards the Middle Ages agriculture and horticulture were already fairly well developed as can be seen in the images of the Limbourg brothers which shows the cultivation of plants; the rise of horticulture and fruit growing in a Middle Age illustration as part of the agricultural calendar in; *Les Très Heures, Mars, ±1440* (Dückers & Roelofs 2005). The origin of the cultivation of plants in agriculture and horticulture, is

Gardens for growing of medical herbs

Already in early times, people started to grow plants for medical use. The monasteries have developed and extended the diversity of plants for use in medicine. Many of these gardens in the Middle Ages became part of newly established universities. The first studies in medicine were in the beginning focussed on the use of medical herbs. Gradually these studies of medical herbs were extended to the study of plants in general which was the start of botany. Botanical gardens are still part of most universities but the study on the level of cells and dna is now an important subject in research in plant sciences. For that part of botany botanical gardens are no longer needed, however botanical gardens still function as urban parks while maintaining their original structure and planting systems.

Gardens for pleasure

We saw earlier in the gardens of the Roman villa's how the planting design evolved from earlier civilisations. In the Middle Ages the production of fruits and vegetables was a regular part of most gardening. In the same period gardens for pleasure started to emerge. Not only the visual qualities of plants but also other sensory qualities were cultivated like scent, fragrance and texture (Sheets & Manzer, 1991). Labyrinths are special examples of pleasure gardens and find their origin in garden art and design. One of the best known early examples of a labyrinth is the 'Labyrinth végétal' in the gardens of Versailles (Lablaude, 1995). It has been inspiring for new labyrinths in the 20th century (Ricci, 2013). The creation of labyrinths is based on the growing of (tall) hedges.

Collecting plants

Garden design has also been strongly influenced by the idea of collecting exotic plants and different species. Jong (1993) did a study on the history and design of the gardens and parks of the Dutch mansions in the 17th century and found evidence of the collecting of exotic plants and the pleasure of gardening in those times. The gardens of these mansions were owned by rich merchants and they got their plants from the trade to the East Indies, now Indonesia. The tropical plants were cultivated in (large) pots and were brought into glasshouses during winter. The growing and cultivating of exotic plants has thrived since. All over the world new species have been introduced in local vegetations, sometimes successfully but there are also examples of exotics that are competing with native plants.

DIAGRAM 1. Turner (2011) starts the development of making gardens from 10.000 BC on. Sørensen (2005), in a classic study on the history of gardens, considers the origins of the discipline of landscape architecture coming from garden art. Garden art itself, according to Sørensen, originates from the cultivation of plants, horticulture. Above a diagrammatic overview of three historical developments that have influenced planting design in design of gardens. All three above-mentioned developments have contributed to the increase of plants used and made useable in planting design. It means that nowadays we have an abundant choice which is still increasing albeit no longer in large numbers.

also an issue in the study 'The same landscapes' of Galí-lzard (2005) in which she analyses projects in Spain, France, Holland, Germany. It is an investigation in the design qualities of plant materials and planting techniques both used in agriculture, horticulture and in designed spaces.

Solomon (1989) emphasises the geometrical patterns used in agriculture and horticulture and draws attention to the aesthetic aspects of utilitarian landscapes in the rural areas.

2.2 Engineering and Architecture from the Roman Empire on

Roman roads covered the entire Empire and were the main forms of communication over land. They were used for military purposes but also for trade.

Napoleon in the 19th century, modernised the French road system on a large scale. They were designed – like the Roman roads – in straight lines and most were planted with trees.

Roman gardens were influenced by Egyptian, Persian and Grecian garden design (Farrar 2000). Due to the travels and getting to know different cultures – think of Alexander the Great – these influences became gradually stronger in later times. The emergence of the different types of villa's (Villa Urbana & Villa Rustica) have stimulated the development of gardens not only in number but also in diversity, form and style.

2.3 Botany; Plants as Object of Research

The growing of special plants for medical purposes has, from early times on, been an activity in monasteries. The Jardin des Plantes in Paris is a good example (Bezombes & Bourgeois 1994).

It is remarkable to see how the historical botanical gardens function both in their original function but are also very popular as urban parks. In the last decade also new botanical gardens have also been designed, partly based on historical design principles but also on contemporary functions.

Chadwick (1966) describes botanical gardens basically as transformations of herb gardens in the monasteries that gradually developed as the first public gardens.

Tomasi (1991) describes the rise of the botanical garden in the 16th and 17th century next to the pleasure garden as a distinct type. Botanical gardens might be the first step to modernisation of garden design because functional principles for the growing of medical and rare plants.

2.4 Forestry: The Production of Timber

From the very beginning on forests have always had a function for hunting, some of the older forests have formerly been preserved due to that use. Forestry as the production of timber started in the Middle Ages. From a perspective of planting design, forestry stands for the long term; at least more than 50 years before. Forests also have a strong visual quality as green mass.

When the population grew, more forests were needed to provide timber for construction but also for fuel. Konijnendijk (1997) describes the rise of urban forestry in Europe. In many cases these forests were originally outside the cities but became later part of them due to urban extensions. Košťof (1999) considers the origin of the boulevard – one of the early examples of linear plantations in the city – as rooted in the tradition of roadside plantations in the rural areas and in forests.

3. How Did These Origins Influence the Development of the Discipline in the Course of Time?

3.1 Garden Design

Garden design deals with the creation of (private) places as elements in the landscape, be it rural or urban. In all cases a garden is first of all an organisation of nature by man which is influenced by individual taste, site, climate, culture. (Diagram 1)

Italian renaissance

In the Italian renaissance the design of gardens evolved in the 15-16th century and was based on artistic principles of that time.

Lazzaro (1990) found that the use of plant materials was identical during the whole period of the style but the differences were in the way man had organised the garden in units, compartments, avenues, orchards through retaining walls, staircases, ramps. Plant materials and their use was the most characteristic of the gardens, by variety and rarity. She also mentions the use of 'natural' ornaments; forms clipped in Buxus or other. Note that plant materials were also used to order the units by hedges, rows of trees.

She also draws attention to the emergence of labyrinths, mostly made out of plant materials, mostly in tall hedges.

In fact the garden was nature 'ordered' by man; at that time there was still a lot of unordered nature.

French baroque

In terms of planting design, the most characteristic of French Baroque was a distinction between garden, park and landscape. Linear plantations and forests as green mass were used in the park.

At the level of materialisation of form, Le Nôtre introduced new planting types; the 'broderie' and the 'tapis vert'; a sloping green used to enhance the perspective (Jellicoe & Jellicoe, 2006). The 'broderie' originated from Italy (Lazzaro, 1990). On the structural level the 'patte-d'oie' as part of the axial systems seems to be inspired on similar street patterns in Rome.

The axial system was supported by linear plantations along the 'Grand Canal'. The use of plantation as green mass has also been extensively used in the park; 'bosquets' (small woods). Solitary trees have not been used in the baroque gardens. The different systems of linear plantations are still used in contemporary park and garden design, not only for aesthetic reasons however.

English landscape style

In the English landscape style, the movement through space and the making use of views towards the surroundings, played a key role. Specific planting types were the clumps of trees, solitary trees and linear plantations. The linear plantations were often 'leftovers' from the original style the Baroque. Contrary to the Baroque, solitary trees were used in the landscape style; it might have originated from the tradition of fruit trees and orchards in horticulture and garden design but possibly also partly from the botanical gardens.

It seems that in contemporary practice, the planting of interchanges and exits to motorways may be inspired by the use of clumps of trees in the English landscape style.

Note that both in the French baroque and the English landscape style, large forests were often part of the plan since hunting was an important activity for the owners and their guests, the connection with the landscape was only visual.

DIAGRAM 2. Park design roughly covers the period from the Middle Ages till now and did comprise the renaissance, the baroque and the landscape style (Turner, 2011).

Above a diagrammatic overview of three style periods that have influenced planting design in design of parks. According to Kostof (1999) the basis for the integration of urban design and park design into landscape architecture took place in the Baroque and was applied by Haussmann and Alphand in Paris. Note that the boulevards of Haussmann were all planted and were, together with existing and new parks, part of what Forestier (Leclerc & Cid, 1997) introduced as 'park system' in the urban landscape.

Urban parks

The design of new public parks in the cities (Birkenhead, Liverpool; Városliget, Budapest) In terms of planting design, the first public parks were often existing parks that were made accessible for the public. New developments in planting design emerged with the rise of the 'Volkspark' in Germany, the first new type of urban park that started to become popular from the beginning of the 20th century on. The design principle of the Volkspark was for a large part based on a functional approach to urban parks; open green space needed to provide also possibilities for physical activity in the outdoors. For these different activities different spaces had to be created. Plantation and planting systems were amply used to create distinct spaces for specific types of use; so it was used to structure space and support movement systems in the form of plantation along paths, roads.

New agricultural landscapes

In Holland the first large project, where the landscape as such was object of planning and design, was the Zuiderzee polders. In this project, between 1930 and 1980, a series of landscape plans were designed at different levels to give form new (agricultural) landscapes. Roadside plantations, new forests, leisure grounds and later nature reserves formed the landscape elements and structures that comprised the landscape plan. The plantation plan was always part of the landscape plan. Planning and design of new large forests is another new domain for landscape architecture and is typical for the 20th century. In Holland the 'Horsterwold', a new forest in Zuidelijk Flevoland, was the first forest of 1000 ha that was planned and designed in the polders. Later in the land consolidation plans an identical approach for landscape development was used as in the polders.

Infralandscape

In the beginning of the 20th century the planning and design of new motorways started. First gradually but after WWII it became a massive development all over Europe.

It is in the infralandscape where the application of linear plantation and new planting systems emerged. On the level of materialisation of form for the landscape plans of the motorways, new species were introduced.

In Holland the use of fast-growing poplar (different varieties and cultivars of *Populus Canadensis* and other poplars). Planting systems evolved from small clumps of trees along roads to linear plantations after WWII.

Next to the motorways, roadside plantations were also used to structure the landscape by plantation through the principle of hierarchy. More important roads were heavier planted than less important roads.

DIAGRAM 3. In the design of landscapes as such, planting design changed considerably. Function, use, aesthetics are now being complemented with comfort, well-being and health. In the contemporary practice the issue of health has become a major goal for landscape architecture as a discipline (Frumkin, 2003; Bowler et al., 2010; Ward Thompson, 2011). Plants, planting and planting design can play an important role in achieving these goals.

Diagrammatic overview of three changes in working domain that have influenced planting design in the planning and design of landscapes.

3.2 Park Design

Park design as the creation of spaces, mostly in the urban landscape. In Europe park design started after the Middle Ages on the basis of garden design and got new influxes from horticulture, botany and forestry. (Diagram 2)

3.3 Landscape Design

Starting from the second half of the 19th century, for the first time in history, the landscape as such became object of planning and design. It marked the start of a totally new approach in landscape architecture; the planning and design of the landscape as public space. (Diagram 3)

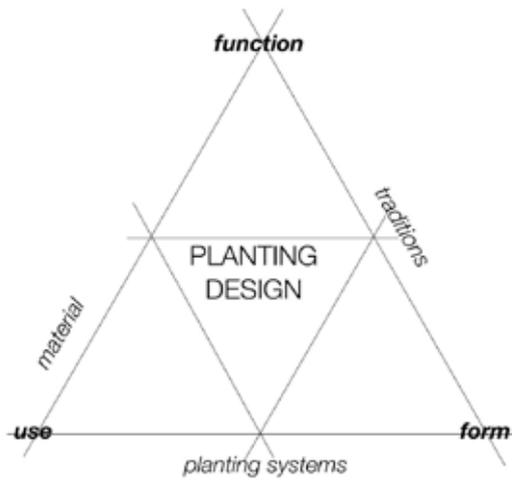


DIAGRAM 4.

Overview of factors that have influenced planting design from earlier times.

Functions of plants and plantation are: production of O₂ and fixing of CO₂; regulating drainage; erosion control; creating comfort. Uses of plantation are: production of food, of timber and other non-food; providing shelter for wind and shade in sunny conditions. The main forms of plantation are: grass, bushes, hedges, trees, ornamental plants.

In planting design in daily practice there are three factors that play a key role: plant material, traditions, planting systems.

A new dimension to planting design which has been added in the last decades is the contribution of plants and planting design to the creation of healthy conditions for the living and working environments of people (Ward Thompson, 2011). Over time, the use of plants as design material did evolve; new plants were introduced, new types emerged.

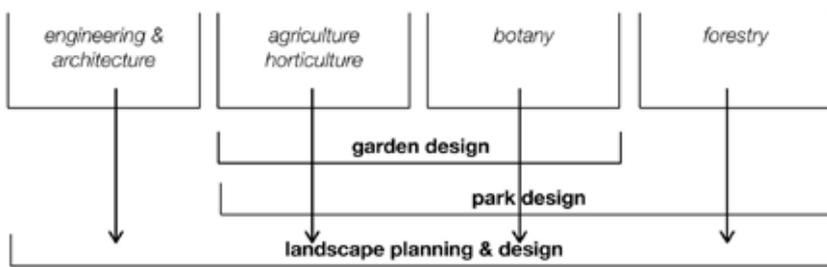


DIAGRAM 5. The diagram gives a schematic overview of the origins and development of use of plantation over time. First of all four origins that have been taken into account in this paper; agriculture / horticulture, botany, engineering & architecture, forestry. Use and application of planting design from these origins have been applied in the historical development of the discipline; garden design, park design and the planning and design of landscapes.

Conclusions

- Function, use and form of plantation. (Diagram 4)
- Origins and development of use of plantation in contemporary practice. (Diagram 5)

References

- Bezombes, D. & L. Bourgeois, 1994. La grande galerie du muséum national d'histoire naturelle. Paris, Le Moniteur.
- Bowler, D.E. & L.M. Buyung-Ali & T.M. Knight & A.S. Pullin, 2010. A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health* 55-10, 456-465.
- Chadwick, G.F., 1966. The park and the town. London, The Architectural press
- Dückers, R. & P. Roelofs, 2005. De gebroeders Van Limburg – Nijmeegse meesters aan het Franse hof 1400-1416. Nijmegen, Ludion.
- Farrar, L., 2000. Ancient Roman gardens. Phoenix Mill, GL, Sutton Publ. Ltd., rev. ed.
- Frumkin, H., 2003. Healthy places: exploring the evidence. *American Journal of Public Health* 93-9, p 1451-1456.
- Galí-Izard, T., 2005. The same landscapes – Los mismos paisajes. Barcelona, Ed. G. Gili.
- Jellicoe, G. & S. Jellicoe, 2006. The landscape of man – Shaping the environment from prehistory to the present. London, Thames and Hudson, reprint.
- Jong, E. de, 1993. Natuur en kunst – Nederlandse tuin- en landschapsarchitectuur 1650-1740. Amsterdam, Thoth.

- Konijnendijk, C.C., 1997. A short history of urban forestry in Europe. *Journal of Arboriculture* 23-1, 31-39.
- Košťof, S., 1999. The city shaped – Urban patterns and meanings through history. London, Thames and Hudson.
- Lablaude, P.-A., 1995. Les jardins de Versailles. Paris, Scala.
- Lazzaro, C., 1990. The Italian renaissance garden. New Haven / London, YUP.
- Leclerc, B. & S.T. i Cid, 1997. Jean Claude Nicolas Forestier – Grandes villes et systèmes de parcs – Suivi de deux mémoires sur les villes impériales du Maroc et sur Buenos Aires. Paris, Éd. Norma.
- Ricci, F.M., 2013. Labyrinthes. New York, Rizzoli Int. Publ.
- Sheets, V.L. & Chr.D. Manzer, 1991. Affect, cognition and urban vegetation: some effects of adding trees along city streets. *Environment & Behavior* 23-3, 285-304.
- Solomon, B.S., 1989. Green architecture and the agrarian garden. New York, Rizzoli.
- Sørensen, C.Th., 2005. Origins of Garden Art. in: Andersson, S.L. & M. Floryan & A. Lund, 2005 Great European gardens. Copenhagen. The Danish Architectural Press., 17-23.
- Tomasi, L.T., 1991. Botanical Gardens of the Sixteenth and Seventeenth Centuries. in: Mosser & Teyssot, 1991. The history of garden design. London, Thames & Hudson Ltd., 81-84.
- Turner, T., 2011. European gardens – History, philosophy and design. London, Routledge.
- Ward Thompson, C., 2011. Linking landscape and health: the recurring theme. *Landscape and Urban Planning* 99-3/4, 187-195.

The Street Raingardens – Students’ Research for Urban Street Areas Solution on Example of Łomianki

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rain garden | street green areas | green infrastructure | plants

Rain gardens are one of the green infrastructure elements, which play a particularly important role in the functioning of urban green areas. These system solutions are not very popular and are relatively rarely seen in Polish cities, and even home gardens. This theme is also relatively new to the education process of landscape architecture students. To meet today's needs in terms of shaping the modern elements of urban green areas, a course for landscape architecture students was prepared. The purpose of it was to present contemporary trends in landscape architecture, with particular reference to the elements of green city infrastructure. With focus on the design of landscape architecture objects relating to street areas. For students almost a natural choice was to use solutions with rainwater retention reservoirs gardens. In their studies the students marked a high awareness to the fact that such hydro-biological treatment plants are extremely important in times of increasing hydrological problems. As a result, study solutions were made and presented in this paper, dedicated to street areas using the technology of rain gardens. The main problem for the students was to make a plant selection dedicated to those places. The results of the students were transferred and presented to local authorities and the local community. All designs, which were characterized by very high originality, enjoyed great social recognition.

Introduction

The problem of wastewater management in Poland is without doubt one of the most important in smaller communities [Bugajski 2006]. Large disparities between the water supply system and the construction of the sewage system cause serious problems during strong rainfall. Drainage systems are often not able to drain off the excess water, this situation is very pronounced in the case of street areas within cities. For those places a very high balance of rainwater and snowmelt is characteristic. Many places during large rainfall, produce extensive puddles which are causing a safety hazard. Only part of the water gets into the sewage system. But the most important problem is that the water is not used for the environment. Therefore, a good option for those spaces is to use one of the elements of green infrastructure – the rain gardens. The issue has become the foundation for the creation of the course for students during first degree studies in landscape architecture. The title of the course is *Shaping plant compositions in urban spaces with case studies of small towns*. During the course, after the presentation of general principles, and lectures in the trends of the development of urban green space, such as elements of green infrastructure system, students had to make a choice of ecological solutions, associated with street greenage. The aim of the course was to lay the foundation to ensure that the students were independently able to identify the problem, assess the limitations of land development and choose the best design solutions. It can be said that in the first edition of the course the students, almost intuitively, chose the use of solutions connecting with rain gardens, thus demonstrating the knowledge, preparation and vast ecological sensitivity.



FIGURE 1.

Methodology and Materials

The first stage of the topic, which was to create an arrangement of greenery along the main street of the town - Łomianki, Warsaw Street, was to conduct lectures on solutions in the field of design problems and various forms of landscape architecture in the street areas. Particular attention was paid during the lectures on the context of the place, a reference to the tradition, history and landscapes surrounding areas. Łomianki is a small town located on the northern outskirts of Warsaw agglomeration. The distinguishing feature of the cities location is the valuable natural areas within and around it. First of all, it holds a significant share of protected areas from the NATURA 2000 in the municipality of Łomianki- it cover almost 10% of the municipality. The presence of the priority habitats requires special attention. In this category basic habitat is coded 91E0 – riparian forest with willow, poplar, alder and ash (*Salicetum fragilis*, *Populetum albae*, *Alnion glutinoso-incanae*, alder headwaters), associated with the Vištula valley [Matuszkiewicz, Kowalska 2009]. In addition, Łomianki adjacent to The Kampinos National Park is a very valuable forest complex, which is a remnant of primeval forests.

Students received geodetic map (scale 1: 500) in digital form, which was a main base for their studies. They also received other starting materials, such as the assessment of the landscape and actual vegetation of municipal Łomianki. During the field work, students conducted an inventory of land development, which included an analysis of the existing vegetation, elements of urban planning, traffic, type of usage and held talks with the authorities of the municipality and residents of the city on the expectations that users have in terms of how the arrangement of the public space.

While working on the subject, the students in independent working groups decided that the best solution for the area was the use of modified hybrid-plants treatment, which combines the benefits of ecology, biology and engineering. Their principle was based on the use of natural water purification processes occurring in wetland ecosystems. Rainwater, flowing down from the surface of the roadway and sidewalks will first settle where there is a pre-treatment by mechanical processes. There

sand is removed, more pollution and mechanical part of the suspension. Then, the waste is fed to the biological treatment plant bed where, thanks to a complicated process, mechanical, biological and chemical wastewater is treated. The bed is filled with gravel, broken stone, rubble or rock debris which is a properly prepared and planted wetland. Purified water then passes through an outlet to the well control and then to the outlet pipe. Such purified water can be used for a variety of purposes [Gizińska, Józwiakowski, Kowalczyk-Jusko, Pytka, March 2013].

An important element of the work was the use of appropriate vegetation. For this purpose aquatic plants and wetland habitats which have a feature that allows the transport of oxygen to the roots were used, allowing for vital processes in the bodies submerged. Through this the plant roots for transporting oxygen produced around them an oxide zone in which the water purification free-living microorganisms live. Zones of aerobic and anaerobic decomposition processes cause pollution simultaneously or alternately which gives a high efficiency of purification. Most of the compounds available are charged and utilized by microbes, and only about one-tenth of the plant. Metabolic products of bacteria leave the bed in the form of gas, it is mainly CO₂ derived from the decomposition of organic matter. Part of the particles precipitates or is permanently connected to the matrix and leaving the rest of the bed of treated sewage drain. Examples of plants that can be used in wastewater treatment wetlands: *Acorus calamus*, *Caltha palustris*, *Carex elata*, *Eleocharis acicularis*, *Geum rivale*. Critical importance in the selection of plants is their phytoremediation ability. Phytoremediation is a technology that uses the higher plants in the purification of the environment (soil, groundwater and surface water, sludge and air). The method is based on the practical application of three types of physiological response of plants to pollutants present in the environment - exclusion, accumulation and hyperaccumulation [Salt, Smith, Raskin 1998]. Students presented the results of their work as posters, using the student software licenses Photoshop and Auto CAD.



FIGURE 2. Students' work part 2



FIGURE 3. Students' work part 3



FIGURE 4. Students' work part 4

Results

Firstly, the works which in a very determined way relate to the surrounding city landscape deserve attention. In the first work there was a very strong inspiration Vištula River valley, with the characteristic of this river, meandering, gentle lines and shore sandbanks and islands are visible. The plant selection is dominated by species of foreign origin that meet the criteria required for storm garden plants. Such plants were selected due to the fact that it is difficult to find a suitable plant species of the native flora, such that they can meet the requirements of the rain garden in street conditions, and will be in nursery production. (Figure 1A)

Similar trends can be found in another study. In this solution the line composition inspired by the natural, meandering course of the Vištula valley also prevails. Students approach to selecting plants are similar to those in the earlier study. (Figure 1B).

A slightly different approach was presented by another team. Students emphasized the ornamentation. Their idea is a selection of the total diversity of landscape the downtown. (Figure 1C)

A similar approach presents the design, prepared by another group of students. This team focused on reference to plans for the development of public transport and the introduction of trams in the space of Warsaw Street. The most important element is the introduction of the green track. However, in areas adjacent to the sequences of pedestrians appear circuits rain gardens. (Figure 2A, 2B, 2C)

Some of the teams have created alternatives for rain gardens. The project presented in Figure 3A uses the concept of the urban gardening and in a regular manner introduces fruit trees and shrubs. (Figure 3A)

An interesting alternative to solutions based on nature for inspiration are drawn inspiration from art. This approach presents the development of the next team that inspired the

geometrical painting (Figure 3B, 3C).

Grid lines project, stems directly from the streets. The fields are filled with significantly differing contents space, in which some of them also included rain gardens.

Part of the team has developed a different piece of equipment for this public space, corresponding to the idea of rain gardens, acting in their interest to supplement (Figure 4A, 4B).

Conclusions

1. The rain garden may be an important element of urban greenery system associated with green infrastructure.
2. The rain garden is a solution that can take the form referring to the nature, or be completely shut off from that style.
3. The selection of plants is essential. Due to some difficulty in the usage of indigenous plants, naturally occurring plants in Łomianki's area which look quite similar can be used, which refer to the physiognomy of their natural plant formation.
4. Such solutions are recognized and socially approved.

References

- Bugajski, P., 2006. Hydrobotaniczne (hydrofitowe) oczyszczalnie ścieków. In: K. Duduś, ed. Trzecia Konferencja Naukowo-Techniczna "Błękitny San", Dubiecko 21-22 April 2006. Związek Gmin Turystycznych Pogórza Dynowskiego, 93-99.
- Cler, M.L., 2004. Stormwater Best Management Practice Design Guide Volume 2. Vegetative Biofilters, EPA/600/R-04/121A September 2004.
- Gizińska, M., Józwiakowski, K., Kowalczyk-Juśko, A., Pytka, A., Marzec, M., 2013. Biomass productivity and biomass energy properties of plants of hybrid constructed wetland wastewater treatment plant in the first year of operation. GAZ, WODA I TECHNIKA SANITARNA 2013 (VII), 280-285.
- Matuszkiewicz, J.M. and Kowalska, A., 2009. Krajobraz i roślinność rzeczywistości gminy Łomianki. Opracowanie wykonane dla Gminy Łomianki na podstawie umowy o dzieło Nr RPG.732-10/2009 z dnia 30 czerwca 2009 r. http://www.lomianki.pl/lomianki2/media/2011/04/2936_Lomianki_roslinnosc.pdf
- Salt, D.E., Smith, R.D., Raskin I., 1998. Phytoremediation. *Annu Rev Plant Physiol Plant Mol Biol.* Jun;49:643-668.
- <http://tvn.warszawa.tvn24.pl/informacje,news,do-lomianek-w-25-minut-br-gmina-planuje-tramwaj,147454.html>, 22.08.2015.
- <http://www.uri.edu/ce/healthylandscapes/raingarden.htm>, 22.07.2015
- <http://abstrakcja-geometryczna.blogspot.com/2013/05/eugeniusz-gerlach-kompozycja.html>, 26.08.2015.
- <http://landarchs.com/rain-gardens-essential-guide/>, 22.08.2015.
- <http://www.fairfaxcounty.gov/nvswcd/raingardenbk.pdf>, 26.08.2015.

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Teaching Landscape

TEACHING LANDSCAPE

RAPHAEL AEBERHARD

New Challenges for Landscape Architecture Education Due to Changing Demands of Urban and Landscape Development in Switzerland**519**

DAVID ESCUDERO

Moving Design: Video as a Teaching Tool for Landscape Architecture**523**

CLÁUDIA FERNANDES

Hands-On! Engaging Students in Green Spaces Maintenance Resorting to Fieldwork Protocols**527**

KATARINA KRISTIANOVA

Teaching Planting Design at a University of Technology: Bridging the Gaps**531**

CONCHA LAPAYESE, RODRIGO DE LA O, FRANCISCO ARQUES

Hybrid Actions into the Landscape: In Between Art and Architecture**535**

LUBICA LEŠINSKÁ

Bridging by Educating: Study Programme "Composition of Garden" for U3A-students**539**

GABRIELA MAKSYMIAK, KINGA KIMIC

Mobile Applications and New ICT Tools in Landscape Architecture Teaching Practice**543**

MAŁGORZATA KACZYŃSKA

Using Different Formats of Case Studies in Teaching Subjects Related to Landscape Design**547**

CATHY MARSHALL

Teaching How to Track Landscape Experience**551**

ALBRECHT MÜLLER

The Is-Ought Gap: A Door Opener for Teaching Ethics in Landscape Planning**555**

ANDREW SANIGA

The Lure of the Australian Outback: Designing in the Field and on the Road**559**

KATJA SVENSSON, MARCEL ROBISCHON

The Use and Value of Learning with Plants**563**

JEROEN DE VRIES, MARIA-BEATRICE ANDREUCCI

Sustainable Garden Design: Students' Perspectives in the "Flower of Life" International Competition**565**

New Challenges for Landscape Architecture Education Due to Changing Demands of Urban and Landscape Development in Switzerland

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landscape architecture | education | spatial planning |
self-perception | outside perception of profession

Through ongoing urban sprawl of landscape, different processes in terms of public initiatives such as the 'landscape initiative' in Switzerland ("Landschaftsinitiative Schweiz") were introduced in order to pursue solutions for inner urban development. Accordingly, several representatives of the Swiss landscape architecture scene repeatedly complained in recent years, to be poorly involved in this discourse. This profession in terms would be purely predestined to face this challenge from a landscape and an urban planning side.

In a brief historical analysis, this since the 1950s repetitive discourse about urban sprawl was illuminated, whereby the role of landscape architecture and spatial planning in particular were considered. In the further course of the survey, qualitative expert interviews and an online questionnaire were empirically conducted with members of the Swiss Federation of Landscape Architects (BSLA) to gain insights about the self-perception of the profession. These findings show, that different views regarding the perception of landscape architecture exist between experts and members of the BSLA. It is clear, that due to inner urban development many problems of urban sprawl could be solved and a significant contribution to high-quality availability of open space with landscape architecture could be realized. However, that the issue could also be addressed by landscape, was hardly considered in the response options of the survey. These reasons can be found on the one hand in the education of Swiss landscape architects and on the other, in the sectoral policies of the central landscape actors such as agriculture, forestry or nature conservation. (Figures 1-3)

Historical Background

The loss of open landscape based on urban sprawl and the associated loss of identity by the community were ongoing arguments in political and society discourses in the past view years. These circumstances raise the question, where is the profession of landscape architecture positioned in this broad social and political debate about urban sprawl respectively inner urban development? It seems as if landscape architects automatically feel responsible for every new challenge in terms of landscape alteration (Wullschleger 2014). This self-perception however seems to have grown historically, is documented in every professional brochure and is taught at the two Universities of Applied Sciences Rapperswil (HSR) and Geneva (hepia). In addition to traditional job fields such as execution planning ("Ausführungsplanung") or open space planning and design, courses like landscape planning and landscape maintenance are offered. But, compared to Germany, landscape planning in Switzerland has no concrete legal policies.

To understand the development of the profession and why several representatives of the Swiss landscape architecture scene mean to be too little involved in the discourse of urban sprawl and inner urban development in Switzerland, it is important to understand what influences the ongoing urban sprawl has had since the 1950s. During the boom in housing construction in the 1960s and 1970s a broad union of intellectuals such as Max Frisch, Markus Kutter or Lucius Burckhardt criticized the Swiss federalism and the autonomy of communities and cities as a catalyst of urban sprawl (Daum 2012). While spatial planners' cause of engagement and the political background were able to initialize the federal law in spatial planning ("Raumplanungsgesetz") in May 1979 (Koll-Schrezenmayr 2008), Swiss landscape architects were only on the way to find and organize themselves. The developments during the 1960s and 1970s were the precursor to get away from pure and often



FIGURE 1. Spreitenbach in 1953; Compact village in the "Limmattal" (Limmat valley). (Source: ETH Bildarchiv)



FIGURE 2. Spreitenbach in 1964; Loss of open landscape based on urban sprawl. Settlements in a complete new scale. (Source: ETH Bildarchiv)



FIGURE 3. "Limmattal" and Spreitenbach 2015: Only natural boundaries such as topography or forest stop the urban sprawl. (Source: Own picture)

formal garden architecture towards landscape architecture and landscape planning in a complete other scale. Before 1970 Swiss landscape architects had to learn their craft themselves or had to study in Germany. This changed in 1970, when the first courses in landscape architecture at the University of Applied Sciences in Geneva, and two years later in Rapperswil were offered (Weilacher und Wullschleger 2002). To date, these are the only two possibilities to study landscape architecture in Switzerland and achieve a Bachelor of Science degree. There is still no possibility to do an academic University degree not to mention a Master's graduation in landscape architecture.

Situation Today

Nowadays, the discourse about urban sprawl is as current as ever. In this context, one must ask what landscape architecture, depending on the quality of the formal instruments of spatial planning and the dominance of the architecture industry, can qualitatively achieve for inner urban development.

As mentioned above, the profession in terms would be purely predestined to face this challenge from a landscape and an urban planning side.

Especially inner urban developments which often have to deal with interventions in existing residential and open space structures, which understandably are criticized by the public. The online-questionnaire with members of the BSLA shows, that landscape architects often seem to be overwhelmed when dealing directly with people in projects, which probably leads to the circumstance, that the inclusion of the public in to the project development is considered to be non-relevant. However, in close relation to the inner urban development, the interviewed experts saw the increased consideration of the public in participatory processes as one of the greatest potentials for the profession. Furthermore, the insensitive handling of public and existing residential and open space structures in transformation areas, such as agglomerations in Switzerland, were mentioned as a real weakness in the architecture industry. In this context, dealing with these existing structures and the thinking in large dynamic connections were especially attested as a "unique selling point" for landscape architects by some of the experts. The statements of the interviewed experts and the BSLA members basically agree, that thinking in scales of urban design and -planning is a further large development potential for the profession in the future. In this regard, it is all about landscape architects learning to



FIGURES 4-5. MFO Park and Oerliker Park in Zurich Nord:

Well known open spaces in Switzerland as a contribution of landscape architects for a qualitative inner urban development. (Source: Own picture)

discuss about all aspects of urban design and -planning and not primarily from the perspective of open space. This postulates, that landscape architects are involved in urban development processes from the beginning.

It can be stated, that especially in the professional areas of urban design and open space development in housing projects, the contributions of landscape architects for a qualitative inner urban development are at a high level. The interviewed experts already positively appreciate this circumstance.

In contrast, dealing with landscape-related disciplines such as landscape planning or -design and what the term "landscape" means for the profession in general, fundamental clarification is required. According to the online questionnaire results, the opinion seems to prevail by the BSLA members, that landscape architects work on space-relevant projects in the open countryside. But this is clearly denied by the interviewed experts. This shows a clear contradiction in self-perception and outside perception of the profession. According to the experts, the area of influence of landscape architects in Switzerland stops at urban boundaries. It's a fact, that the particular interests of the central landscape actors such as agriculture and forestry or nature conservation determine the landscape development. Nevertheless, landscape planning and -design in Switzerland have a really difficult position. This will be exacerbated to the extent, that the first generation of landscape planners in Switzerland, with an education background from Germany, are age-related no longer active in the operative business. And although landscape planning is one of three equivalent specialization areas in the Bachelor studies in Rapperswil, the online questionnaire results show, that young BSLA members are not really interested in landscape-related disciplines such as landscape planning or -design. Landscape planning seems to be a relic from the founding years of the HSR, when well known protagonists such as Bernd Schubert or Dieter Kienast adapted a German system in to the Swiss education. Until today it wasn't possible to transform landscape planning in to Swiss practice as a relevant professional field for landscape architects. In context of today's political and social sensitization for landscape it seems to be clear, that the handling of landscape in

all facets needs to be equivalent to urban design and -planning. The close relation between landscape quality and the formal instruments of spatial planning seems to make it necessary, that both professions - landscape architecture and spatial planning - work closer together. Since 2013, the newly offered Master of Science "MRU Raumentwicklung und Landschaftsarchitektur" seem to be a right step in the right direction.

These and other findings can be drawn from the empirical part of the research results. Finally, key topics of landscape architecture such as the identification of the profession on the political agenda, of the interface between spatial planning and landscape planning are treated as a new "spatial design" topic in education. This under the premise to make a space-relevant contribution to the discourse of urban sprawl of landscape, respectively inward urban development and to improve the perception of the profession in public.

References

Journal article:

Daum, M., 2012. Die Zeit - Schweizer Architekten: Denker außer Dienst. Die Zeit.

Book:

Koll - Schretzenmayr, M., 2008. Gelungen - misslungen?: die Geschichte der Raumplanung Schweiz. Zürich: VerlNeue Zürcher Zeitung.

Wullschleger, P., 2014. Fata Morgana, Von der Wahrnehmung der Landschaftsarchitektur. Bund Schweizer Landschaftsarchitekten BSLA.

Weilacher, U., Wullschleger, P., 2002. Landschaftsarchitekturführer Schweiz. Birkhäuser, Basel [u.a.].

Moving Design: Video as a Teaching Tool for Landscape Architecture

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workshop | landscape design | teaching | video recording

This paper examines questions regarding the role of video in recording and representing the landscape around us, both in the analysis and the design phases. When used in analysis, this medium reveals what would otherwise be invisible and allows new spatial meanings to be given to a location, linking it to our contemporary culture. As a project tool, it has a major impact when used alongside other tools, since it provides them with a phenomenological variable.

In the second section, a teaching method used at the 'WAVE 2015' workshop in Valparaíso (Chile) is presented. Almost 40 students worked for five days on the design of a new seafront area at the two outermost points of the city. The paper provides a selection of videos of both of the stages (analytical and design), which were produced by the students, to demonstrate the importance of these pieces of footage for perceiving, identifying and adequately meeting the needs of the location. This video-based method allowed students to think freely about the essence of the exercise without focusing on defining the morphological and typological aspects.

(Inter)(Trans)(Multi)-Disciplinary: Contemporary Approaches to Landscape Design

In recent decades, various architecture and landscape theorists have highlighted the growing distance between man and his surrounding environment owing to, among other factors, the great abstraction of the contemporary world (Girot 2010). Not only does the environment in which we live change over time, but our perception and awareness of it, as well as our lifestyles and our sense thresholds (our appreciation of colours, sounds, dirt, darkness, cold or heat) also change. Just as our bodies are not generic, our perception, abilities and cultural behaviours are also different. In this sense, the call for a rediscovery of phenomenology, the body, perceptions and sensations seems to have been clearly made (Zardini 2005; Corner 2006; Allen 2001).

The present day is being affected by these inclusive dynamics insofar as the boundaries between different disciplines seem to be blurring, creating fluid and effective communication between fields of expertise. Thus, terms such as interdisciplinary, transdisciplinary or multidisciplinary are ever more frequent. Current thinking about new variables, approaches, ideas and methods in the debate about city and territory places man as the focal point of urban planning in terms of meaning, memory and experience. This synaesthetic movement has been supported by renowned authors who are defending, with increasing fervency, a holistic approach to architecture that is based on the sensory experience.

Since these principles were established, there have been many attempts to develop models and theories that provide an adequate approach to our contemporary surroundings. This brings new topics of discussion to the table regarding the creation and modification of the city: topics such as experience, phenomenology, cultural memory and the



FIGURE 1. Tools of perception. Gonçalo Manteigas y Kukas Veltrusky. Landscapevideo

collective imagination are coming to light and are becoming of vital importance. Against this background, research conducted using this approach provides a rich and fertile field of study for landscape architecture today.

It seems logical, then, that a new theoretical approach to landscape studies brings new needs and challenges for the effective analysis thereof, as well as for improving the way landscapes are represented and, ultimately, designed. For this reason and because this contemporary thinking is linked to everything, a succession of techniques and tools have emerged that allow us to meet the new demands raised by theorists. Various emerging practices have taken on growing importance: immersion in the landscape, virtual reality, experimental fusions of art and design, aesthetic knowledge, 3D modelling, the capturing and visualisation of aerial images using UAV technology, and so on. Together, these approaches reinforce the absence of a single method and encourage the acquisition of knowledge through the complementary use of different tools. They do not serve solely for the study and analysis of certain historical moments; rather, they also play a decisive role in the planning stages, especially in contexts such as urban regeneration, when the collective meaning is much stronger. Nevertheless, and despite their disparity in nature and in method, they all converge when it comes to considering the individual and his experience as the focal point.

In summary, the current approaches described so far form the basis of this piece of research:

1. The inclusion of the individual and his or her experience in the different processes;
2. The diffusion of disciplines to create knowledge by adding different approaches;
3. The complementarity of tools as a study and design method.

Audiovisual Register as a Tool

Audiovisual resources allow us to see and compare many stages of the same place simultaneously, compare built environments from practically the world over, analyse spatial behaviour and identify the potential that lies in the filmed landscape. Without any claim to rigorousness or precision, they have the extraordinary capacity to suggest situations hidden from everyday view.

In this context, audiovisual register has become a vital tool for enhancing the individual's experience and its connection with the collective memory. In the words of Christophe Girot, video creates some images which shape our collective understanding of landscape. Therefore, landscape design has to deal with a visual pool of references located in the cultural and social memory. It is worth highlighting the work in this field of ETHZ in Zurich where, for the last 15 years, they have been developing the use of video as part of the landscape architecture courses at the MediaLAB run by Girot. There, in Sabine Wolf's words, they produce video sketches that reveal existing or built identities of a place, which are then used to create interactions in the usage, cultural imprint, history and ideas of it (Girot 2010).

The phenomenological nature of video means that one must revisit the usual criteria and working methods, which are so often concerned with technical, functional and formal aspects to the detriment of sensory factors. The problems arising from the built environment certainly manifest themselves in this way, and that is precisely why they need to be solved through the use of new peripheral tools that are sometimes far removed from any building activity. These tools are essential if we are to reveal elements that cannot be conveyed through technical documents. Video is able to portray a social dimension of the landscape that goes unnoticed on paper; a dimension that must be taken into account in contemporary landscape design.



FIGURE 2. Link Valparaíso - Viña del Mar. Manuel Pérez, Felipe Vergara, Vivian Vega, Alejandro Guerra.



FIGURE 3. Plaza de los Loros. Danica Mazuela, Paulo Álvarez, Vania Molina, Nicolás Lara Y Paulina de la Torre.

The Valparaíso Experience and Conclusions

In the light of the recent experience at the WAVE2015 workshop in Valparaíso, when applied to teaching, film can produce revealing results. The workshop lasted for five days and was organised by the Universidad de Valparaíso (UV) and the Universidad Politécnica de Madrid (UPM), with support from CONICYT, Parque Cultural de Valparaíso (PCdV), the Universidad Andrés Bello (UNAB) and the Universidad Técnica Federico Santa María de Chile (USM).

Almost 40 students worked on the design of a new seafront area at both ends of the city's coastline. These areas shared the same linear functionality and slope, as well as the presence of various elements of industrial heritage. The short duration of the workshop necessitated the use of highly efficient tools, not only for the analytical work but also for the assessment criteria and the design of the new landscape. The use of video, mapping, audio recordings, sketches and live drawings were therefore vital for the optimal development of the workshop.

A selection of the pieces of work that were produced enables the different approaches to be discussed. It can be accessed through the following link: <https://vimeo.com/164234112>

This method allowed the students to go beyond the usual functional analysis of the urban structure and proposals based on spatial zoning. The videos enabled an emphasis to be placed on existential, relational, emotional and atmospheric parameters. In addition, some pieces of high conceptual and visual quality were produced, enabling some very different approaches to the exercise proposed.

When it came to the design of the new landscape, the students immediately focused on sensory and experiential design, before even considering what formal shape their proposals should take. Ultimately, the method served to energise, optimise and facilitate unconventional approaches at a workshop of just five days in duration. The students designed phenomena and sensations, a first vital step in finding appropriate ways to meet the needs of the location.

References

- Allen, S. (2001). Mat Urbanism: The thick 2D. En H. Sarkis, Le Corbusier's Venice hospital and the mat building revival. München: Prestel
- Bazin, A. (1958). Qu'est-ce que le cinéma? Paris : Editions du Cerf.
- Berger, J. (1983). Ways of seeing. London: Penguin Books & British Broadcasting Corporation.
- Cairns, G. (2007). El arquitecto detrás de la cámara: la visión espacial del cine. Madrid: Abada.
- Deleuze, G. (1984). La imagen-movimiento. Estudios sobre cine 1. Barcelona: Paidós.
- Didi-Huberman, G. (2000). Devant le temps : histoire de l'art et anachronisme des images. Paris : Les Éditions de Minuit
- Eisenstein, S. (1987). Nonindifferent nature. Cambridge: Cambridge University Press.
- Girod, C. (2010). Landscape in motion = Landscapevideo. Zürich : gta Verlag.
- Merleau-Ponty, M. (1993). Fenomenología de la Percepción [1945]. Barcelona: Editorial Planeta-De Agostini.
- Pallasmaa, J. (2001). The Architecture of Image: Existential Space in Cinema. Helsinki: Building Information Ltd
- Truniger, F. (2013). Filmic mapping : film and the visual culture of landscape architecture. Belin: Jovis.
- Waldheim, C. (2006). The landscape urbanism reader. New York, N.Y. : Princeton Architectural Press.
- Zardini, M. (2005). Toward a sensorial urbanism. En M. Zardini, Sense of the city : an alternate approach to urbanism (págs. 17-27). Baden: Lars Müller.

Hands-On! Engaging Students in Green Spaces Maintenance Resorting to Fieldwork Protocols

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teaching and learning | techniques | practical classes |
gardening | millennial generation

Management and maintenance of green spaces is a growing activity with many job opportunities and in much need of skilled labour in Landscape Architecture. However, most landscape architecture students still subordinate the apprenticeship of these subjects. This article describes the importance of fieldwork classes to engage students with maintenance techniques, assuming the garden as an open air laboratory. Classes begin with a short lecture followed by a practical exercise, guided by a protocol. Among other tasks students execute phytosanitary assessment and treatments, pruning, planting and staking, vegetative reproduction, bulb transplanting and weeding. This method is being applied since 2011 with the support of some green spaces in the city of Porto, especially the Botanical Garden. Students' appreciation regarding this area of knowledge has grown as evidenced by pedagogical surveys.

I. Management and Maintenance of Green Spaces – Core Competences in Landscape Architecture

In 2010, in the document entitled Tuning Landscape Education in Europe, Bruns et al. asserted: 'Landscape Architecture counts on management as creative process, where numerous planning and design considerations are involved. Management and maintenance components are here recognised as Core Competences for Landscape Architects. Nevertheless, in Portugal, most landscape architecture schools continue to subordinate the apprenticeship of these matters and, as consequence, most graduates still ignore the various job opportunities that this area, in full development, has to offer. Despite the imperativeness of landscape architecture labour-skilled personnel in this area, the reduced competitiveness ultimately facilitates the appropriation of these activities by other fields, such as agricultural and environmental sciences, which are less prepared to integrate aesthetic issues and design in the landscape's long-term development.

The perception of these issues led to a shift in the teaching paradigm of these competences, within the bachelor of Landscape Architecture at FCUP. Ever since its establishment in 2001, this course distinguishes itself by assuming management and maintenance of green spaces as a skill to be developed integrating into its study plan two specific course units (CU) – Green Spaces Maintenance Techniques and Management of Outdoor Spaces, which take place in the 3rd year, in the 1st and 2nd semesters, respectively. Initially, these CU were highly theoretical, but the implementation of the Bologna process provided for an opportunity to test a more interactive learning model intensifying the practical component.

This paper describes the teaching model of the CU Green Spaces Maintenance Techniques, based on the performance of field tasks oriented by protocols, also presenting the main



FIGURE 1. Photographs of working classes in the garden.

reasons for its choice, constraints on its application and a statistical and qualitative assessment of the students' level of satisfaction.

II. Why a Hands-On Approach? Rationale and Constrains

We can summarize the main reasons justifying the choice of this method in the following points:

- We are now teaching the Millennial Generation, young people for whom traditional teaching models based on lectures and memorization are no longer suitable. Instead, an interactive and collaborative teaching methodology, with multi-tasking challenges, group work and participatory lectures are more effective methods (Stasio Jr., 2013).
- A learning experience, following the principles of "experiential learning" or "learning through reflection on doing", taking place in a training context enables the assimilation of concepts more effectively and a stronger skills' development, as the experience remains and endures in whom performed it (Beard, 2010).
- The classes are given outdoors, in parks and gardens. Students finally leave the classrooms forgetting their computers for a few hours. After all, we are teaching about outdoor spaces but much of the learning is done indoors. It is increasingly urgent to counter this paradox.
- This method develops a sense of commitment and belonging. By actively participating in the preservation of a place, students become emotionally attached to it and feel rewarded by observing their efforts' results.

However, the implementation of this method has some risks and constraints:

- The unpredictability of the weather can be a problem especially because the CU run during the winter.
- It implies the availability of some park or gardens to welcome and accept task execution by students, that are, willing to admit the possibility of error.
- It requires great adaptability. Sometimes the contents and protocols have to be quickly prepared or readjusted depending on the tasks that the host garden agrees to or the opportunity of participating in a task that runs more sporadically, as in the case of some phytosanitary treatments.
- Taking students from the classroom, leading them outside and having them handle tools such as scissors, weeders or hedge cutters involves risks. It is important to ensure that students feel and are in fact safe.

III. How Do We Do It?

At the beginning of the semester, the activities to be performed are articulated with the host garden. Currently there is a stable collaboration with the Botanical Garden of the University of Porto, but it was initially difficult to get partners, so protocol implementation has been progressive and adapted to the conditions of each space. In general terms, it has been possible to ensure the execution of tasks related to the maintenance of the green structure:



FIGURE 2. Maintenance plans for the Botanical Garden of the University of Porto developed in 2015.

Questions	Dimension	Target
Relevance of the objectives	Critique and clarity	Course unit
Suitability of the evaluation form to the objectives of the course unit	Evaluation	Course unit
Enhancement of student participation in learning activities	Evaluation	Course unit
Difficulty level of contents	Difficulty	Course unit
Workload and runtime required according to the objectives and credits of the course unit	Difficulty	Course unit
Contribution to the improvement of education in the area	Difficulty	Course unit
Overall appreciation of the course unit	Difficulty	Course unit
My knowledge and ability to understand events and themes treated	Impact of the CU	Course unit
My capacity for critical reflection	Impact of the CU	Course unit
My ability to analyse the implications of ethic, social and political of the subjects stud	Impact of the CU	Course unit
My curiosity for new areas of research or professional practice	Impact of the CU	Course unit
My ability to communicate ideas, information and solutions	Impact of the CU	Course unit
Organization and structuring of the content and activities of the course unit	Structure	Teacher
Presentation of multiple perspectives	Structure	Teacher
Adoption of the contributions of research or professional practice into teaching	Structure	Teacher
Respect for students	Relationship	Teacher
Good relationship with students	Relationship	Teacher
Ability to stimulate the motivation and interest of students	Support towards autonomy	Teacher
Promotion of critical reflection of students	Support towards autonomy	Teacher
Commitment to the quality of teaching / learning	Support towards autonomy	Teacher
Global teacher appreciation	Support towards autonomy	Teacher
Availability for monitoring and supporting students	Consistency and Assistance	Teacher
Implementation of the evaluation rules agreed with the students	Consistency and Assistance	Teacher
Use of information and communication technologies (e-learning, availability of documents and presentations in digital format, ...)	Consistency and Assistance	Teacher
I actively participated in the teaching / learning activities (school, work or other activities)	Involvement	Student
I have worked independently	Involvement	Student
I have been actively involved in the course unit	Involvement	Student
I talked with classmates about the content / worked	Involvement	Student
I have used information and communication technologies (e-learning; Sigarra ...) as a study tool	Involvement	Student

TABLE 1. Pedagogic survey available to students for evaluation of the Course Units. (Excerpt)

Maintenance of Trees and Shrubs. This is the longest topic and with the greatest number of protocols associated, mainly because the CU work in autumn/winter a time when many of the cultural operations on trees and shrubs are conducted. Until now, the protocols which have been signed relate to: planting and transplanting; phytosanitary diagnosis and treatments; and pruning of trees and ornamental shrubs.

Maintenance of Groundcovers. This theme includes works in lawns and herbaceous and subshrubs groundcovers and the task involve weeding, dividing and transplanting of bulbous and rhizomatous species and deadheading.

Irrigation and Water Management. This protocol takes place in the studio and not in the field because it is related with the design of an irrigation plan. However, students are previously led to observe an irrigation system operating, with various types of watering and implementation schemes, that they then try to replicate.

All classes begin with a brief theoretical introduction of 30-45 min. at most, in order to present key concepts and best

practices, followed by 3 hours of practical exercise guided by the previously distributed protocol (Figure 1). This protocol contains a summary of the previously presented concepts, step-by-step instructions for performing the task, a list of equipment to be used and handling instructions. Other matters which are not covered by the protocols, including maintenance of built structures, water features, lighting, cleaning, inspections, etc. are taught in lectures.

The practical assessment is done in groups based on: a report for each protocol, delivered in class following its implementation; and the outlining of an annual maintenance plan for the garden in which the activities took place. During the preparation of these items, students are invited to reflect upon their experience and evaluate their own performance (Beard 2010) (Figure 2). The theoretical evaluation is individually based on a written test.

IV. Assessment – Pedagogical Questionnaires

This teaching methodology's impact was evaluated based on the analysis of pedagogical questionnaires conducted by FCUP at the end of each semester. The survey (Table 1), the same for all subjects of all courses, is structured in 29 questions

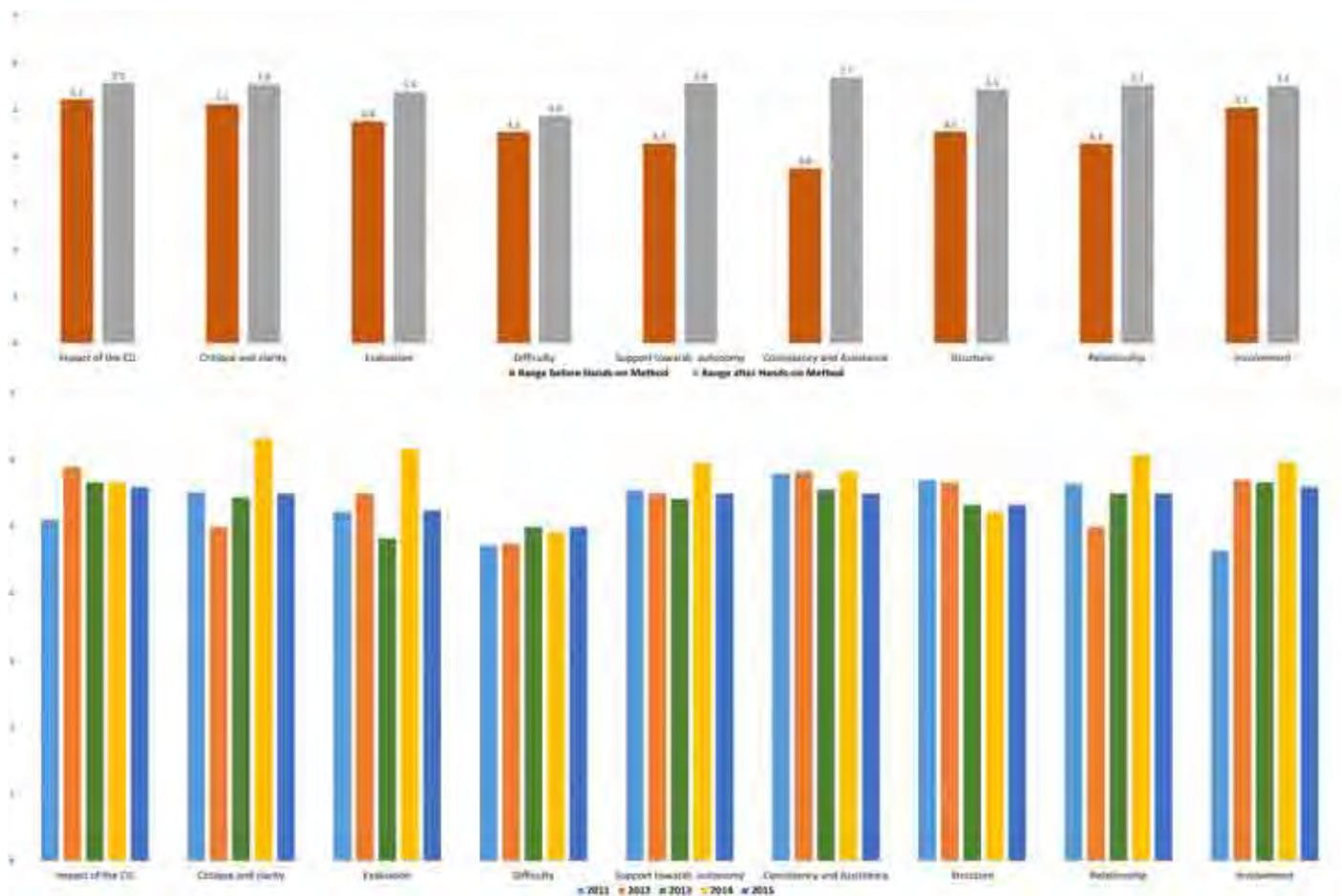


FIGURE 3. Results of pedagogical surveys of the course of Green Spaces Maintenance Techniques.

spread over nine dimensions targeting the appreciation of the CU (Critique and clarity, Evaluation, Difficulty, Impact of the CU), the lecturer's performance (Structure, Relationship, Support towards autonomy, Consistency and Assistance) and the student's effort (Involvement). The responses follow a scale from 0 to 7.

Graphs in Figure 3 compare the results of the surveys conducted before and after the introduction of the Hands-on method. All dimensions analysed yielded a more positive assessment after the implementation of the Hands-on method. Simultaneously, students did not feel that the CU had suffered an increase in the degree of difficulty. The results of the questions related to the student are quite interesting as the effect of the method's implementation appears to have been even more evident. This result is in line with the theories which advocate a more dynamic, informal and interactive learning environment for the Millennial Generation (Stasio Jr. 2013).

However, the success of a Hands-On teaching method will always be deeply dependent on the availability of students to join and perform the proposed tasks, and sometimes they just don't want to do it. So it will always be very important to find out in advance the characteristics and motivations of the group and guide the teaching and learning experience accordingly.

Acknowledgements

A special thanks to all the students of Green Spaces Maintenance Techniques who have so enthusiastically adhered to this different way of sharing knowledge and to the heads of the host gardens that have allowed this adventure to continue.

References

- Beard, Colin. 2010. *The Experiential Learning Toolkit: Blending Practice with Concepts*. 274 pp. ISBN 9780749459345.
- Bruns, D., Ortacesme, V.; Stiles, R.; de Vries, J.; Holden, R. ; Jorgensen, K. 2010. *Tuning Landscape Education in Europe*. Draft Version 26. The Tuning Project ECLAS – LE:NOTRE.
- Stasio Jr., J. R. 2013. *Rethinking Assessment: Understanding How the Millennial Generation Learns in the College Classroom*. *Pedagogy and the Human Sciences*, 1, N° 3, pp. 34-51.

Teaching Planting Design at a University of Technology: Bridging the Gaps

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landscape architecture | education | study programme

Landscape architecture requires broad knowledge in the fields of natural and biological sciences, art, architecture and urban planning disciplines. The diversified nature of profession is reflected in the diversity of study programmes. The individual focus of universities is specifically reflected in their teaching and study programmes – graduates from agricultural universities generally have broad knowledge in the field of plants, graduates from schools of architecture in the field of arts, architecture and urban planning, graduates from universities of natural sciences in the field of natural and biological sciences. The aim to balance and harmonize the requirements of diversified knowledge for the profession of landscape architect is in the centre of development of study programmes. The paper discusses the aspects of teaching planting design in the Bachelor degree study programme of Landscape Architecture in the environment of technology education – at the Faculty of Architecture of Slovak University of Technology in Bratislava. It analyses the possibilities and specifics to balance the requirements for planting design knowledge in the curriculum of the study programme, which is focused more on “spaces” than “species”, and identifies the potential of innovative methods of teaching, which are able to eliminate disadvantages of teaching planting design in landscape architecture programme within the environment of technology education in comparison with the programmes provided in agricultural education environment.

Introduction

Landscape architecture is a quite young and dynamically evolving discipline, whose roots, as noted by Spirn (1997), lie in several constellations of disciplines: agriculture (gardening, horticulture, forestry); engineering; architecture and fine arts; science (ecology). According Spirn (1997: 254-255), tensions and contradictions in landscape architecture stem from inherent, unresolved conflicts among the disciplines from which it draws, from disparate ideas about the relationships of humans to nonhuman features and phenomena. As noted by Spirn (1997: 254): “Landscape architects hold strong ideas about nature; whatever it means to them, they tend to care about it, for the beliefs and values those ideas represented are usually at the heart of why they entered the profession.” Waldheim (2013) puts the question of meanings to claim landscape as architecture, and answers that in so doing, the field “has recommitted to its origins in the urban and infrastructural arts, and reanimated the potential of landscape as a medium through which to remediate the social, environmental, and cultural conditions of the contemporary city.” (Waldheim 2013: 20).

The aim to balance and harmonize the requirements of diversified knowledge needed for the profession of landscape architect stays in the centre of development of study programmes.

The programmes provided by Slovak University of Agriculture in Nitra and Slovak University of Technology in Bratislava exhibit differences and specifics, which may constitute, on one hand advantages and benefits, on the other hand disadvantages and negatives. The individual focus of universities is specifically reflected in their teaching and study programmes – graduates from agricultural universities generally have broad knowledge in the field of plants, graduates from the school of architecture in the field of arts, architecture and urban planning (Krištiánová 2015). The aim is to bridge the gaps and to balance

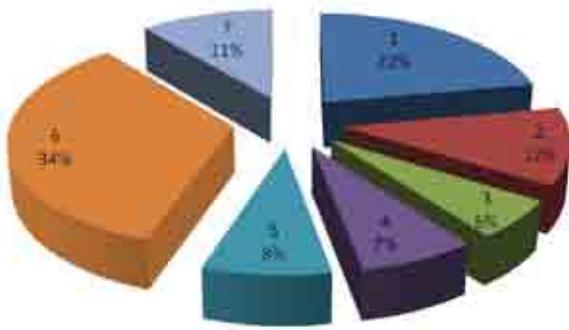


FIGURE 1. The ratio of different groups of subjects in the study plan of the bachelor study programme Landscape Architecture and Landscape Planning of the Faculty of Architecture, Slovak University of Technology in Bratislava. The groups of subjects: 1 – technical, 2 –plant science 3 – environmental science, 4 – art, 5 – theory and history of art, 6 – architectural design and planning subjects and 7 – other.

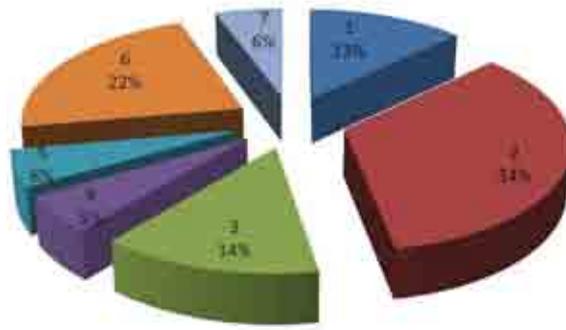


FIGURE 2. The ratio of different groups of subjects in the study plan of the bachelor study programme Garden and Landscape Architecture of the Slovak University of Agriculture, Faculty of Horticulture and Landscape Engineering in Nitra. The groups of subjects: 1 – technical, 2 –plant science 3 – environmental science, 4 – art, 5 – theory and history of art, 6 – architectural design and planning subjects and 7 – other.

and harmonize the requirements for provision of diversified knowledge.

Specifics of Teaching Planting Design in the Environment of Technology Education

With the objective to analyse the possibilities and specifics of teaching planting design in the environment of technology education, the curriculum of the Bachelor degree study programme Landscape Architecture and Landscape Planning of the Faculty of Architecture, Slovak University of Technology in Bratislava, accredited in 2009, has been compared with the curriculum of the programme Garden and Landscape Architecture accredited in 2009 at the Slovak University of Agriculture, Faculty of Horticulture and Landscape Engineering in Nitra. Descriptions of characteristics of study programmes, graduate profiles and contents of study plans, in terms of hourly subsidy of subjects, divided into 7 subject groups (1 – technical, 2 –plant science 3 – environmental science, 4 – art, 5 – theory and history of art, 6 – architectural design and planning subjects and 7 – other) have been compared.

Descriptions of study programmes and characteristics of graduate profiles of both programmes are very similar and come from the description of the study field in the Slovak System of Study Fields. Comparison of the contents of study plans in terms of hourly subsidy of subjects divided into 7 subject groups shows significant differences. Figure 1 shows the ratio of different groups of subjects in the study plan of the bachelor study programme Landscape Architecture and Landscape Planning of the Faculty of Architecture, Slovak University of Technology in Bratislava. Architectural design and planning subjects represent 36% (group 6), technical subjects represent 22% (group 1). Subjects in the field of plant science represent only 12% (group 2). Figure 2 shows the ratio of different groups of subjects in the study plan of the bachelor study programme Garden and Landscape Architecture of the Slovak University of Agriculture, Faculty of Horticulture and Landscape Engineering in Nitra. The ratio of the plant science subjects represents 34% (group 2), followed by architectural design and planning subjects, representing 22% (group 6).

The comparison shows that the significant difference between the programmes is formed mainly by the proportion of plant science subjects (group 2) and environmental science subjects (group 3). While in the bachelor degree study programme at university of agriculture they form the characteristic 48% share, in the bachelor degree study programme at university of technology they represent only a share of 18%. However, the specificity of the programme provided by Faculty of Architecture, Slovak University of Technology is the rich hourly subsidy of architectural design and planning subjects (group 6), art (group 4) and subjects of theory and history of art (group 5), which create the characteristic 49% share in the programme. Another characteristic feature of the programme provided by Faculty of Architecture is the rich hourly subsidy for the studio work, which creates 29%. This teaching mode is used for teaching architectural design and develops abilities to handle the creative processes of landscape architecture.

Conclusion

As mentioned by Bruns et al. (2010:26-27), vegetation and plant materials knowledge is characteristic and in many respects unique for landscape architecture. The subject area 'Vegetation and Plant Material' in landscape architecture is regarded as the knowledge, skill and competence to use, handle, planning and design with plants. The core of knowledge is consequently to be specified in relation to the three professional landscape activities that are carried out by landscape architects landscape design, landscape planning, and landscape management (Bruns et al. 2010:26-27).

Disadvantage of the low hour subsidy for teaching plant science subjects in the programme of Faculty of Architecture is compensated by the use of several methods and modes of teaching aiming to deliver the sufficient amount of knowledge about plant material and skills in vegetation establishment. Except lectures and seminars in plant science subjects, specific focus on aspects of plant design is applied mainly through teaching design studios. Excursions, field trips and practical internships included in the study programme are specifically

aimed to acquire practical skills and professional competences in plant design. These innovative methods are applied to balance the requirements for planting design knowledge and to eliminate the disadvantages of teaching planting design in the landscape architecture programme within the environment of technology education in comparison with the programmes provided in agricultural education environment.

References

- Bruns, D., Ortacesme, V., Stiles, R., Vries J. de, Holden, R., Jorgensen, K.,
ECLAS Guidance on Landscape Architecture Education. The Tuning Project
ECLAS – LE:NOTRE. Tuning Landscape Architecture Education in Europe,
Report, version 26.
- Krištiánová, K., 2015. Tendencie výučby krajinej architektúry - špecifiká
bakalárskeho študijného programu krajinej a záhradnej architektúry na FA
STU. In: Krištiánová, K., Stankoci, I. (eds.) Krajinná architektúra a krajinné
plánovanie v perspektíve. Bratislava, Nakladateľstvo STU, 204-220.
- SPIRN, A. W., 1997. The Authority of Nature: Conflict and Confusion in
Landscape Architecture. In: Wolschke-Bulmahn, J. (ed.) Nature and Ideology
- Natural Garden Design in the Twentieth Century. Dumbarton Oaks
Colloquium on the History of Landscape Architecture, Vol. 18, 249-261.
- WALDHEIM, Ch., 2013. Landscape as Architecture. Harvard Design Magazine:
Landscape Architecture's Core? No. 36.

Hybrid Actions into the Landscape: In Between Art and Architecture

CONCHA LAPAYESE | RODRIGO DE LA O | FRANCISCO ARQUES

University of Madrid, Spain

hybrid | actions | landscape | art | architecture

The teaching research project "HYBRID ACTIONS INTO THE LANDSCAPE: IN BETWEEN ART AND ARCHITECTURE" is integrated within the interdisciplinary research framework of the "Cultural Landscape Research Group", G.I.P.C. Based in the Superior Technical School of Architecture (Escuela Técnica Superior de Arquitectura) of the Technical University of Madrid (Universidad Politécnica de Madrid), the project is an Experimental Workshop and operates as a training process for the regular students of architecture to obtain a sensibility within the contemporary landscape through Actions on Art.

On these premises, the teaching research project aims at revealing landscapes within the European framework of "Contemporary Cultural Landscape". The present work synthesizes the research developed through the last course in 2015, showing the evolution and the main targets of AH Lab, inside the GIPC since 2006. ECLAS 2016 will focus into the teaching process, so we would like to share our researches and produce a critic discussion on it.

AH Lab. Strategy: (n) Actions / (n) Maps

The project begins by studying several landscapes at the peripheral urban sites throughout our geography, each of them with a different character to be understood as a sample and model of study. They all invite us to propose a revitalization of these landscapes by enhancing the specific territories and architectures created and manipulated during the urban exploitation process.

It is a cultural landscape project that recovers the memory of the site, by enhancing the typical features of each territory and looking for their identity. The interest and timeliness of the project lie in the margins of relevance and urgency surrounding these sites. We have realized the need for a new kind of gaze on these places that brings awareness of the inert beauty lying under the apparent state of ruin.

"From where ...the landscape comes from?" ask Dario Gazapo, professor and founder of GIPC and principal of this laboratory. If we follow his tour around the meaning of the term landscape, we can understand where we are located as a critical Lab:

The definition of "Landscape" implicitly bears the idea of construction and consequently, the use of a "specific logics" making that action of concept formalization possible. The first action of the process assumes a choice over a referential position where the landscape constructor is located. It is from that hypothesis or initial decision where, after a vertiginous and unpredictable process will be developed an understanding which will conclude with the formalization of a definite landscape. It is from the analysis of such situations where discussion and criticism are possible. It is from the origin of the thinking process where the specificity, shaped in the form of a glance, is established...
(Gazapo 2010)



FIGURE 1.

Today we must rethink landscape design and be aware of the possibilities of the expanded field, a process of hybridization and mixing this with new disciplines. “HYBRID actions in the landscape: between art and architecture” is a subject that aims to intertwine work, thinking and ways of doing, linking architecture and art as a political state of action.

AH 2015 – Hybrid_Accomplices

In this occasion we would like to show our methodology and strategies in respect to the teaching process of landscape, dealing with the creative process of critical actions and effective cartographies combining art and architecture, and to offer as discussion the case study we call “Madrid Borderscapes”, the south-east peripheral borders, stopped by the last economics-crisis. In these territories is where we have explored and looked for innovation in landscape studies through action-sites and conceptual maps, where the process becomes a reflection on the possibility of rethinking these landscapes affected by the economic bubble in the borders of Madrid.

The locations, due to their scale, imply the possibility of a route, they are different spaces, “La Gavia Ruins Park”, “Berrocales graveyard”, “Atalayuela bubble scape city”, “Vallecas deserted strip”, where to rebuilt from a hybrid action between Art and Architecture. An action which allows us a slow time of meditation close to these already existing places and rethink them from a new point of view, which allows the realization of other latent dimensions, below the apparent state of urban ruins.

“Hybrid Accomplices” explore and look for innovation in landscape studies integrating architecture, territory, urbanism, history, art, politics and social sciences. This complex process proposed is made possible by a series of appropriating the gaze of specific artists as possible “accomplices” during the research

procedure. It is a process of extreme fragility and responsibility that lets us produce critical reading of the study zone.

AH 2015 Lab/Accomplices

Jean Benoît **McGuire** – Irene **Warburg** – Marina Marker – Álvaro **Weiwei** – Tatiana **Emmet Gowin** – Paula **Winogrand** – Rafael **Oiticica** – Thibault **Christo** – Ana **Jeanne-Claude** – Romuald **Lernert Sander** – Leire **Bravo** – Heleen **De Keersmaeker** – Oriana **Basilico** – Elisa **Soto** – poWu **Caiguoqiang** – Xu **LiYang** – Inés **Archigram** – Tuo **Kabarov** – Ma **McGuire** – Rodolfo **Kleon** – Zeng **Guanzhong** – Bárbara **Slabbinck** – Graziela **Stevens** – Yue **Xi Meng** – Óscar **Liu Cixin** – Anaïs et François **Karen Bausch**.

Each area is developed as a dialogue between art and architecture, where artistic procedure are staged by multiple views. It is a hybrid process, which aims to combine a double view, between fields, where the beginning of short dialogues between art and architecture act as a key starting to extend an action which promotes the sensibility of looking at the urban landscape.

ECLAS 2016 AH Tour

ACTION I: “THE MANIFESTO”

Álvaro + Artist/ Ai Wei Wei

ACTION II: “CLAY TO RECOGNIZE THE SITE”

Wu + Artist/ Mancianas

ACTION III: “PARALLEL”

Xu + Artists Li Yang and Marcel Duchamp

ACTION IV: “Soundscape”

Oscar + Artist Cage

ACTION V: “So much time”

R.LERNERT & SANDER ANDES

ACTION VI: “DRIFTING CARTOGRAPHIES”

Paula + Artist WINOGRAND

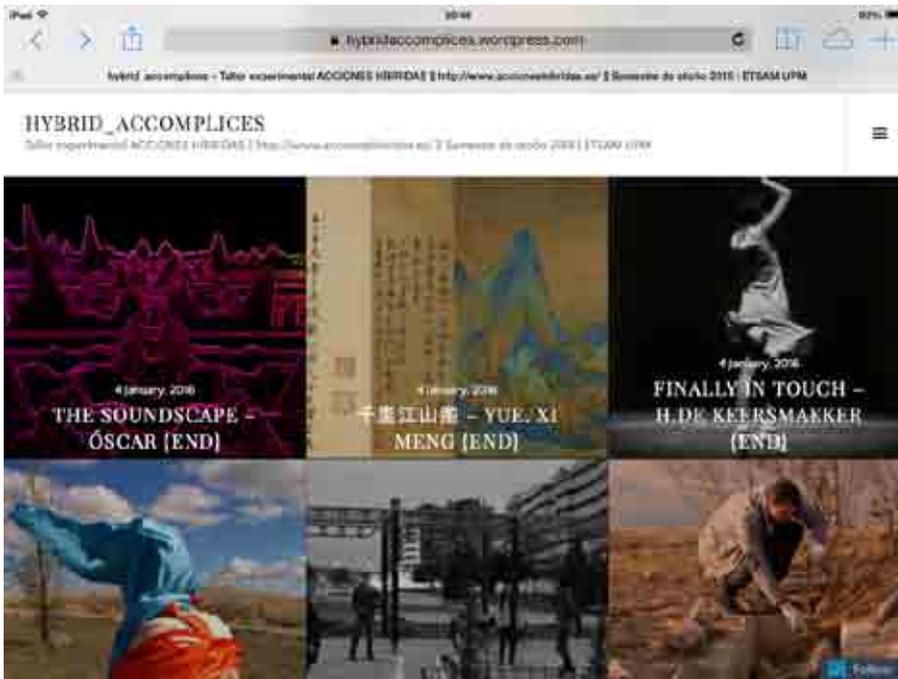


FIGURE 2.

Conclusions

These days it is vital to re-think architecture and be aware of all the possibilities of this expansive field. So we tend to hybridize this and other disciplines. The Hybrid Effects in Landscape subject tries to interweave work, thoughts and operating skills of the architect in order to reinterpret the contemporary landscape.

Our process of action begins with a decision, a choice of a theoretical and mental site in which every one of us proceeds to move back and forth, and appropriate the dawn of our new landscape. Reveal our own reference framework from a specific look. Choose a proper look to get introduced through an investigation methodology. Build an analysis framework in between the diverse strategies of landscape interpretation.

We have been contrasted with the AH Lab. that the combination “art and architecture” is a rich method to understand our contemporary landscapes. The approximate process that we offer in AH let the students familiarize with the artistic compromise, this approach combined with the experimental trip to the site, lets us offer a method that educates the sensibility to the reality and at the same time let us test the reality with simple actions. The results are translated in critic’s maps in different formats, which present a new glance to the real. From this position we will be able to design more compromised landscape design projects with a sensible understanding of the complex reality.

AH presentations will reflect the research of the projects with videos, conceptual maps and images generated by the Lab., discussing the questions of how, why and from where to build critic actions into the landscape in between art and architecture, thanks to a methodology that combines going back and forth to the site, and that needs the experience of the site as a key

part of the process. We will show the results and the operative conclusions as a critical perspective about the teaching practices and learning processes of cultural contemporary landscape.

We invite you to visit our web site: <http://www.accioneshibridas.es/> ETSAM UPM, and specifically the blog created for this research in December 2015.-<https://hybridaccomplices.wordpress.com/> in order to be able to share our research to the academic world. AH Lab. Let us draw a displacement across multiple trips to the place that allows us to build a first threshold in the landscape, at the border line between the city and the countryside, at a polemic site where the action of questioning became necessary. To be able to achieve what we proposed in our AH Lab.: to look again from interdisciplinary as the first interaction, where “Hybrids Actions ...” proposes a revision of the evolution in the experimental strategies proposed in art all along the XX century and the beginning of the XXI, as a sensible field to operate as architects, landscapes architects, politicians and urban designers at these complex’s edges.

“The real one, look at that...” (AH)

References

- Gazapo, D. and Lapayese, C., 2010. From where...the landscapes come from? US, Nº 7: 12-15 DOI:10.4206/aus.2010.n7-03.
http://mingaonline.uach.cl/scielo.php?pid=S0718-72622010000100003&script=sci_arttext
- Lapayese, C. and Gazapo, D., 2009. La construcción del paisaje, ed. Dapp
- Smithson, R. 1996. Robert Smithson: The Collected Writings, ed. Jack Flam
- <http://www.accioneshibridas.es/>
<https://hybridaccomplices.wordpress.com/>
<http://dpa-etsam.aq.upm.es/gi/gipc/>

Bridging by Educating: Study Programme “Composition of Garden” for U3A-students

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garden design | study program for U3A |
composition of garden | graphic works

Nowadays in Slovakia, every bigger university has Institute of Lifelong Education with University of Third Age (U3A) which provides informal education for students - seniors (50+).

The Slovak University of Technology in Bratislava at Faculty of Architecture proffers educating in the fields: Architecture and Urbanism, History of Architecture, Architecture and Buildings of Bratislava, Garden and Landscape Architecture I, II, III. Every school year has two semesters each with 7 lectures and the eighth discussion.

In the Garden and Landscape Architecture the first year is dedicated to the history and park design, the second one is focused on the theory of landscape. The chosen didactic method is preferentially expositional - lecture. The third year is specialized on the creation of garden. The Garden Design programme is specific by exercises where students create various compositional works and a layout of the real (own) garden. There is important to choose suitable didactic methods and forms of motivation, needed for an appointed goal - creating the graphic works.

Bridging is inspiring

The talk about bridging the gaps is important and important is also the gaps really to bridge by concrete acts. Bridging the gaps by education enables the educated (individuals) to keep pace with time, to survive independently and with taste, also to fulfil own dream.

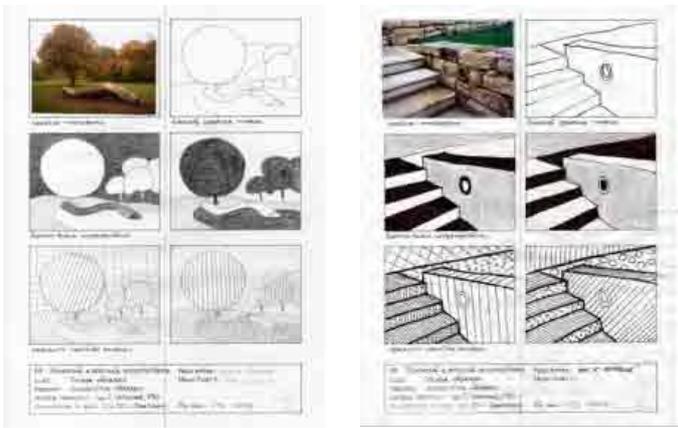
Study programme Garden Design at U3A

The two-semester programme Garden Design is specific by practical application of the theory to works in exercises which are focused on stimulating of creativity. The education is realized in group with 15 - 20 members.

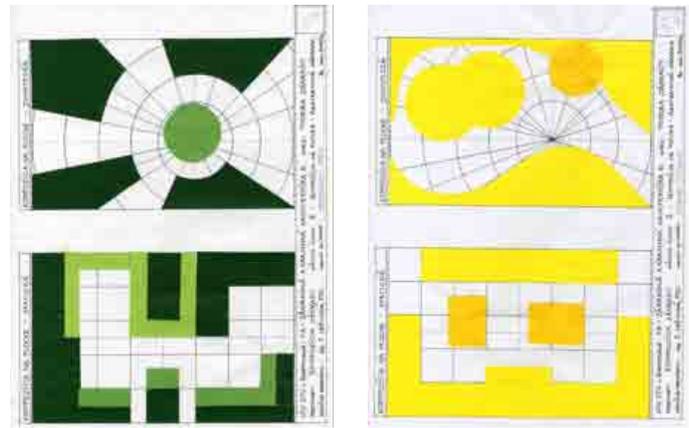
The programme has 32 classes overall, in the winter semester it is focused on garden composition, in the summer one on design of real garden. Every semester (by 16 classes) consists from 8 two-hour units. The frequency of meeting is once in two weeks. Each unit contains a lecture on given topic in the first class, and an exercise, during the second one, where the theory is practised by concrete work (with using some art methods).

The winter semester is ended by common presentation of compositional artworks with discussion, the summer one by design of garden by each student, with exposition.

The educating programme is composed of separate parts Composition of Garden and Design of Real Garden.



FIGURES 1 & 2. Game with lines, interpretation of forms, textures of planes - work 1. Čačková, D., 2015, Repíková, A., 2015.



FIGURES 3 & 4. Abstract garden (2.) - composition on the plane in static and dynamic version. Hermannová, M., 2015, Čačková, D., 2015.

Composition of Garden

The Composition of Garden is oriented on acquiring of foundations of composing in the garden space dimension. An accent is put on using of compositional tools and compositional principles in creation which is characteristic by employing of abiotic and biotic (vegetation) components as compositional elements with the distinct character.

The theoretical part in lectures is divided in spheres:

- composing as basic instrument of creative process in garden architecture,
- theory of fundamental elements and their relationships in garden composition,
- compositional tools and their using in garden design,
- spatial dimension and specifics of composition in garden design,
- impression and using of light and colours in exterior composition,
- relationship between composition and creation of style.

In theoretical part, the compositional values in garden architecture are continuously accentuated.

The application of theory to designing of compositions in exercises is made by works with the graphic output. Every work has the topic and title:

- Game with lines, interpretation of forms, textures of planes (work 1)
- to create a lineal graphics by using of contour lines (under inspiring picture), Abstract garden (2.)
- to create a composition on the plane in two versions - static and dynamic, Modern exterior (3.)
- to create a spatial composition from chosen layout (previous work) by help of axonometry, Harmony, contrast, and rhythm in the colour (4.)
- to create 3 colour compositions with using Ostwald's colour circle, Meditative garden space (5.)
- to create 2 compositions with using the principles of symmetry and asymmetry.

In Composition of Garden, the graduates learn to project an idea to composition in assigned works so that it meets aesthetic criteria.

Design of Real Garden

The Design of Real Garden is focused on creation of the garden layout. The theory in lectures is divided in:

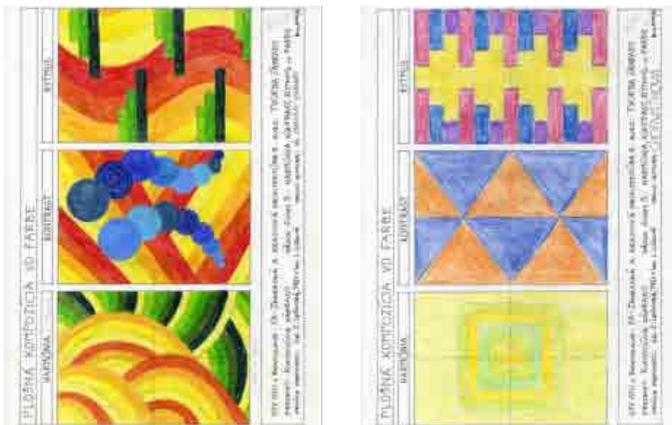
- conception, philosophy, decorativeness and functionality of garden, garden styles,
- architectural co-part of garden - basic and supplementary buildings,
- vegetation co-part of garden - wood species, decorative herbs, and vegetation covers.

In theoretical part, there are permanently emphasized the examples of modern and traditional garden arrangements.

The part of the programme is excursion to the botanical garden. In the application part, it is possible to arrive to the design of garden by two procedures:

- from details to a whole: at first the designs of architectural and vegetation components and in the end an overall design (with using made details),
- from whole to details: at first the program of garden activities, site analysis, concept in schemes then an overall layout, and details in other scale.

It seems the procedure from whole to details has bigger motivational effect for the solution of garden layout.



FIGURES 5 & 6. Harmony, contrast, and rhythm in the colour (4.) - 3 colour compositions. Madarás, S., 2015, Chorváthová, A., 2015.



FIGURE 7. U3A-students in the botanical garden in Bratislava.

Feedback

The effectiveness of Garden Design programme is continuously verified by the pedagogical diagnostics and in the end of school year also by the questionnaire method.

The goal of questionnaire was to gain information about impact of programme, especially handling of graphic side by students. As emerged from exploration, a majority of students did not devote to creative activities with graphic outputs professionally (art, architecture), a majority is with university degree, a majority has the practical interest about contents of program because has own garden.

All participants confirmed that number of graphic works (5) was adequate in part Composition of Garden, 80% of them mentioned that some works were difficult for them.

The most difficult works were: Modern exterior (3.) - a transition from plane to space with using axonometry and Harmony, contrast and rhythm in colour (4.) where to connect more levels of creativity is needed.

All students agree that they prefer the evaluation by the contemporary classification (A - Fx) complemented by word evaluation. They are able to accept also non-excellent evaluation if the causes of it are explained and the possibility of correction given.

All respondents appreciated the level of provided study literature - presentations of lectures and manuals for exercises. Besides literature, they acknowledged the explanation, illustrations, consultations, and excursion to the botanical garden.

Conclusions

The goal of Garden Design study programme is stimulating the student creativity by making compositions, practising the designs of gardens and their parts, presenting the performance by graphic outputs according to aesthetic criteria.

For procedure of educating in this programme is important (time assessment is modest) the choice of didactic methods, steps and suitable instruments which are necessary for an appointed goal - designs of compositional works and layout of garden.

The contents must be focused on basic structure and substantial elements and parts of curriculum so that all squeezed in the given time frame.

The methods must be sufficiently illustrative:

- theory in lectures illustrated by examples of the real solutions (with comments)
- application of theory in the works in exercises, with using various illustrations

The steps must be in logic sequence:

- from general to concrete, from idea to realization (design),
- from analysis to synthesis, from appraisal of site (natural conditions) to layout of garden,
- individual operations successive, results visible, differences of variants clear.

The instruments must be more motivational (as for regular students):

- motivation has to be soft (praises, non-material rewards, occasions of choice),
- there is important to make an optimal atmosphere in the group (feeling of confidence),
- manner of teaching has to instigate the imagination and fantasy,
- heartening in creativeness has to lead to fine thinking and to practice of evaluation by aesthetic criteria,
- provided tools (study literature and manuals for exercises) have to enable a self study and work at home.

For effectiveness of educational programme focused on creation, it is important to determine suitable procedure of presentation elements (of curriculum), because the sequence, the visible interconnection, and the showing of coherence can bring the synergic effect for acquiring the contents.

Recources

Čačková, D., Hermannová, M., Chorváthová, A., Madarás, S., Repíková, A., 2015. Compositional works from U3A-programme Composition of Garden, SUT in Bratislava, SR

References

Grant, W, R. Landscape Graphics. Revise Edition. Watson-Guption Publications, New York, 2002.

Mobile Applications and New ICT Tools in Landscape Architecture Teaching Practice

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ICT tools | mobile apps | public spaces design | urban green spaces

The paper presents a review of existing ICT tools and mobile applications, which can be successfully used in landscape architecture teaching practice. The performed survey included various mobile solutions applied in Poland and other European countries that make a landscape architects life easier. As a result, the study identified a range of possible practical applications of apps and ICT tools in landscape architecture teaching process. The presented examples include: 1) applications enhancing education process (e.g. learning of plants, etc.), 2) tracking applications (e.g. used for assessment of users flow and congestion in recreational spaces), 3) site analysis and mapping apps (e.g. enabling fast measurements of land area, distance, angle of a slope using a Smartphone camera, etc.), 4) tools for brainstorming and concept development (e.g. with use of augmented reality), and 5) tools for sketching, illustration 3D modeling. Moreover, the review of the above mentioned new solutions, was followed by a critical reflection showing both pros and cons their application in landscape architecture education.

Introduction

Modern life of many people revolves around the favors of civilization. Current realities and society expectations impose on people new ways of working, leisure and lifestyles. One of the determinants of a changing society is ever-present, for more than two decades, a generation of 'digital natives' – tech-savvy young people, who feel safe only in environments dominated by electronics (Prensky 2001; Bennett, Maton and Kervin 2008; Bennett and Maton 2010). Since these 'digital natives' might also be our students of landscape architecture, the question appears whether we should accept their altering expectations toward ways of studying, and in a response, include new methods or tools (apart from computer aided design solutions – CAD) in the study programme.

To answer this question, it is crucial first to explore what kind of innovations can be found on the market, but also to find out if students are really interested in them. Additionally, there are opinions that landscape architects education backgrounds in regards to innovative use of ICT and especially CAD / CAM do not match the same standards as those of architects (Fricker, Grirot, Munkel 2013). Thus, this paper is aimed at a pilot review of new tools, which could be used as an enhancement for teaching practice.

Materials and Methods

In order to find out what the ICT tools available on the market are, we filtered the content of Google Play Store by entering keywords matching the terms linked to landscape architecture profession, such as: 'landscape', 'design', 'plants', 'trees', 'contour lines', etc. The idea was to work in a "quick & dirty" manner, just to find out if there are any apps that might be potentially of any use in a design studio or other landscape architecture related course. At the same time, we browsed the professional webpages, blogs and literature, however since the technology is changing very fast, we used journal papers rather to build

ID	Tool's / app's name	Functionality
applications enhancing education process		
1	Like That Garden – Flower Search	- identifying a plant by matching a snapped picture - plant characteristics
2	iForest	- identifying forest plants basing on a picture
3	LandscapeAR augmented reality	- transforms a sketch of contour lines into a 3D model
tracking applications		
4	CyberParks app	- record of routes and time spent in studied area - possibility for adding questionnaires (to study users expectations).
site analysis and mapping apps		
5	Slope Calculator	- calculate the slope between two point on different elevation and has a map converter to make it easy for measuring
6	Simple slope	- calculating slope stability according to a defined loading (buildings, traffic, etc.)
tools for brainstorming and concept development		
7	SketchShare	- enables fast and easy sharing of graphic files
tools for sketching, illustration, 3D modeling		
8	Spacedraw	- enables professional 3D modeling for mobile multi-touch devices

TABLE 1. Selected examples of ICT tools that can be identified as useful for landscape architecture students.

the knowledge platform than to find out new trends or novel applications. As a final stage of our pilot study on new tools, we have interviewed a group of last year master students in landscape architecture at Warsaw University of Life Sciences. This final step was designed as a check to find out their opinions and expectations in regards of application of ICT tools in study curriculum.

Results

The performed search shows that digital solutions are in fact omnipresent and they deal with a wide variety of topics: from computer-assisted design (CAD) to very specific mobile tools to be used on a Smartphone. The survey assortment of apps present on the market let us for elaboration of typology according to their functionality, including:

1. Applications enhancing education process
2. Tracking applications,
3. Site analysis and mapping apps,
4. Tools for brainstorming and concept development,
5. Tools for sketching, illustration, 3D modeling.

By applications enhancing education process we understood all apps allowing for studying plants and trees, e.g. Like That Garden – Flower Search or iForest apps. These applications allow for recognition of plant or tree species based on a photo taken by Smartphone camera. The apps also include information on Latin names, and species description with helpful information for example how to cultivate a plant, etc. This category also includes applications allowing for a better development of 3D imagination, such as LandscapeAR augmented reality. This app translates 2D contour lines into 3D landscape models. This functionality seems very useful for those students who cannot visualize the relief easily.

Another group of tools are tracking applications. In general, they can be used for the monitoring of user flow and congestion

in outdoor public spaces. In some cases they can also offer a possibility of studying behaviour e.g. by recording route and time spent in various park zones or even users expectations towards design of a studied area by enabling creation of questionnaires (as CyberPark app).

The next category of tools are site analysis and mapping apps that allow for fast measurements of land area, distance, and angle of a slope etc. using a Smartphone camera. An example app is a slope calculator, which allows for a fast calculation of a slope between 2 points on a map.

The application of augmented reality (as mentioned in regards to CyberPark app) can be also used for brainstorming and concept evaluation. However for that purpose various sketch sharing tools can also be used. One example is a SketchShare, which enables fast and easy sharing of graphic files and for simultaneous work of several users. Last but not least are applications allowing for sketching, 3D modeling and illustration that can be exemplified by SpaceDraw.

Discussion and Conclusions

The great majority of apps found in the Google Play Store (by filtering 'landscape' related keywords) deal with conceptualization and/or graphic design of gardens or small green spaces. Many of them also offer collections of landscape photos that are meant as a source of inspiration (e.g. Landscape Design Ideas, Home Design 3D Outdoor / Garden, iScape Lite Landscape Designs, PRO Landscape Home or Landscape Architecture apps). However, most of them are in fact rather simple as they offer readymade designs. As their target users are not young professionals, but rather amateurs, who want to design their garden on their own. Nevertheless, among those apps addressed more towards non-professionals, are also solutions that can be used by landscape architecture students.

References

- Bennett S., Maton K. (2010) Beyond the 'digital natives' debate: Towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning*, Volume 26, Issue 5, pages 321–331.
- Bennett S., Maton K., Kervin L. (2008) The 'digital natives' debate: A critical review of the evidence, *British Journal of Educational Technology*, Vol. 39 (5), pages 775-786.
- Fricker, P., Giroto, Ch., Munkel, G., 2013. How to Teach 'New Tools' in Landscape Architecture in the Digital Overload, eCAADe 2013: Computation and Performance – Proceedings of the 31st International Conference on Education and research in Computer Aided Architectural Design in Europe, Delft, The Netherlands, September 18-20, 2013.
- Prensky M. (2001). Digital Natives, Digital Immigrants Part 1, *On the Horizon*, Vol. 9 (9), pages 1 – 6.

Using Different Formats of Case Studies in Teaching Subjects Related to Landscape Design

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case study | landscape design teaching | visual analysis | landscape evaluation

The paper deals with the teaching practice of students from two faculties of Warsaw University of Life Sciences-SGGW related to landscape shaping. In the teaching process different forms of case studies have been applied. All described courses are aimed to enable students to perceive landscape as a set of different values, depending on geographical location, socio-cultural conditions and civilizational development. During the classes students prepare individual or group tasks which include a single case study analysis. Depending on the course objectives and assumed learning outcomes, a proposed case study includes more general or in-depth analysis. In the paper three examples of employing case studies method in the teaching process are described.

Case Studies Description

The paper deals with the teaching practice of students from two faculties of Warsaw University of Life Sciences-SGGW related to landscape shaping: landscape architecture faculty and spatial economics faculty. Three examples of employing different forms of case study in different stages of the teaching process are described. The author understands the case study as an in-depth analysis of a bounded spatial unit using suitable methods to collect data required for future design process.

The author argues that the case study is an efficient method in the teaching process for future professionals dealing with landscape shaping. This method can be successively applied both at early stages of education, and in an advanced level of studies.

Example 1. Early stage of education. A case study task is applied in drawing classes for the first year students in the Bachelor degree of the landscape architecture course.

Task description: In each class students are given one example of a site, such as part of a park, urban landscape or rural landscape. During the on-site visit they should make quick (15-20 minutes) sketches from human level, which record a physiognomy of the site. They are also encouraged to embody in the drawings their personal impression of the site. The aim of this case study is to teach students how to gain essential knowledge about a site, which could be used as a potential subject for redesigning activity, for instance how to properly capture the certain qualities and properties of a site in a drawing. Part of the task was also to choose the right spots and directions for making each sketch. (Figure 1.)

Learning outcomes: This case study method enables students to understand that their own on-site sketches are a more valuable tool for making site documentation, than photographs which are easy to be taken, however do not allow for in-depth landscape recognition. Only through on-site observation can



FIGURE 1. Students' sketches recording the physiognomy of different sites.



FIGURE 2. The example of a case study on-site perceptual analysis using G. Cullen's theory – The Warsaw Old Town.

- 'Silhouette' - high neo-gothic brick building of the St. John the Baptist Basilica.
- 'Seeing in detail' - vivid colours and architectonic decoration of the Old Town houses and 'foils' - relationship between various types of material and architectural styles.
- 'Incident', a point which draws one's attention - church towers or silhouette features.
- 'Focal point' - the statue of the Warsaw Mermaid in the middle of the market place
- Experience of 'thereness' - the distant view of the Vistula river valley located beneath the historical Warsaw Old Town.
- View of known 'here' and unknown 'there' – the passage through the Barbican.

Students learn to understand that the surrounding environment is composed of clearly or less clearly visible interiors which consist of walls (architectonic or natural), floors and ceilings (such as the sky or upper branches of trees). They are able to distinguish the foreground and the background of the view. They gain a sense of scale of the space, they gain the ability to estimate dimensions and proportions of landscape elements. They are able to notice in the landscape certain spatial order, rhythms, hierarchy of forms and spaces, contrasts, fractures and landscape changeability depending on season/ time of a day which influences the light, range of colours, trees and shrubs formal features, transparency and other temporal qualities. The students' drawings reveal that each have a different sensitivity and focus on distinctive site details. Further design processes based on the in-depth site recordings, will prevent wasting the sites values or introducing the site to forms of improper scale, colour or structure.

Example 2. Mid-advanced stage of education. A case study task is applied in the course of the socio-cultural bases of spatial economics for the second year students, of the Bachelor Degree of the Spatial Economics faculty.

Task description: Each group of students (3-4 persons) is given a different example of urban space – a well-known square, a representative course, or a historical city centre. Each group should prepare a case study of on-site perceptual analysis. The analysis is divided into five steps according to J. Skalski method (2007): identification of the urban space borders and entrances, recognition of its internal structure and identification of physiognomic details and interpretation of their visual and semantic values for the landscape. In these steps of analysis it is recommended to use well-known visual analyses of landscape physiognomy such as K. Lynch's method (1963, 1980) (the six crucial elements building the image of the city: paths, edges, districts, nodes, landmarks) or G. Cullen's method (1971) (the



FIGURE 3. Wilanów – historical cultural landscape with monumental palace and garden complexes as an example of subject of in-depth case study.

emotional reaction that the environment produces can be effectuated in three ways: ‘Concerning Optics’, ‘Concerning Place’ and ‘Concerning Content’). The last step is to identify within the urban space interior, spots where the distant view till horizon is possible. These spots have a special value in usually dense urban landscape. The aim of the task is to teach students how to look at and how to understand the landscape and its values which determine its identity. (Figure 2.)

Learning outcomes: The case study applied at a more advanced level of education allows students to gain specific information about the analyzed landscape such as: the entrances leading to the landscape interior are not clearly visible, the internal landscape structure reveals characteristics of intentional or spontaneous composition, there are particular objects and details, there are spots within the landscape interior where one can look outside etc. A more in-depth case study allows students to also experience: general atmosphere, sense of safety or danger, sense of shadow or luminosity, interactions between people using the space, variety of space use, hidden semantic values etc. The perception of landscape physiognomy and values can be crucial for conceptual design ideas. Creative ideas originate from in-depth perceptual analysis of a landscape. The landscape perceptual analysis, understood as the ‘art of observation’ should be an ability of each landscape architect.

Example 3. Advanced stage of education. A case study task is applied in the cultural landscape evaluation and protection course, for the ERASMUS students of a Master Degree and for the students of the Spatial Economics faculty.

Task description: As the subject of the in-depth case study, students (in groups of 2-3 persons) are given an example of a historical cultural landscape with its masterwork monuments (i.e. former palace and garden complexes, sacral buildings etc.) with unique natural values and relicts of historical, long-lasting forms of land use (i.e. fields, pasture meadows, orchards). The task consists of: historical analysis (based on materials given by a professor responsible for the course), identification of the landscape uniqueness and values - resulting from both natural and cultural conditions, evaluation of the present state of the landscape, indication of the main threats and elaboration of the guidelines for the future conservation and development. (Figure 3.)

Learning outcomes: The in-depth case study of an example of a high-quality historical cultural landscape allows students to gain knowledge and ability to perceive landscape as a set of different values, depending on geographical location, socio-cultural conditions and civilizational development. They learn to understand landscape shaping as continuous

changes in the evolutionary process, and creative continuation of our ancestors’ works. They learn to appreciate the existing historical and natural landscape values and relations between them, to notice the necessity of saving and protecting them for future generations. They become familiar with the main threats to a landscape’s value, resulting from a lack or insufficiency of legal protection, wrong local planning policy, lack of local community and authorities awareness of landscape values etc. An in-depth case study enables students to think creatively about the designing process regarding the historical achievements of the previous generations. The gained knowledge and skills can be applied in the activities related to landscape shaping and designing. Students learn to understand how historical landscape elements can influence the planning and designing process. They learn to perceive historical value, not as obstacles for introducing new modern designs, but as the valuable heritage which determines landscape identity and which they can take advantage of in a creative way.

Conclusions

Case studies are often used in professional education concerning landscape architecture, landscape design, urban planning, urban design etc. (Francis 2001). Case studies can be used in different stages of education and can employ a variety of analysis methods focusing on different aspects such as historical, cultural, visual, and social.

All chosen case studies stress the development of students, from early stage in education, such as the ability of reading the landscape, and seeing its unique features and threats. They are focused on making direct observations of the sites analyzed, which allow to familiarize students with concepts and solutions worthy of replication and those which proved to be wrong. Results of subsequent design tasks given to the students who previously have done case studies consisting of landscape perception (observation, selection of essential characteristics), evaluation (organization of perceptual experience, indication of significant elements) and interpretation (recognition of meaningful composition) leading to guidelines or conceptual design elaboration prove that this method is efficient academic education tool for landscape architects.

References

- Cullen, G., 1971. *The Concise Townscape*. New York: Van Nostrand, Reinhold Comp.
- Francis, M., 2001. A Case Study Method For Landscape Architecture. *Landscape Journal*, 20 (1), 15-29.
- Lynch, K., 1980. *Managing the Sense of a Region*. Cambridge: The MIT Press.
- Lynch, K., 1963. *The Image of the City*. Cambridge: The MIT Press.
- Skalski, J., 2007. *The perceptive analysis of landscape as a creative action initiating the design process*. Warsaw: Warsaw University of Life Sciences Press.

Teaching How to Track Landscape Experience

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design teaching | visualization | cultural landscape experience | Louisiana

Representation in landscape architecture is expanding its processes and tools to other disciplines to better interpret landscape experiences. Moving beyond traditional orthographic projection, which only records the location of objects, students used a variety of tools and representational methods to visualize the changing qualities of Southern Louisiana and experiences of those who engage the landscape.

Students were asked to define a strategy of inserting themselves into the landscape; driving, biking and walking, to explore other discipline specific tools that record change and lastly interpret the differing environment's conditions and experiences through hybrid drawing, collage and photomontage (Marshall 2008). Documenting spatial relationships through image, mark, duration and tempo by layering dimensional data, and drawing the acceleration and accumulation of landscape experience through adjusting opacity and notations (Allen 2003, Corner 1999) Figure 1.

New tools and hybrid drawing methods allow students to learn how to read the dynamic landscape, to recognize and build upon the experiential character of a site and to recognize that each site, every landscape reflects the processes and events that shape the place.

Recording Tools

The act of drawing is an irreplaceable method with which we can better understand landscape. This paper discusses both traditional and nontraditional tools from other disciplines, and explores using various low and high technologies, including the students' knowledge of pencil and paper, measuring tapes, cameras, audio recorders, GPS, weather stations, speedometers and heart rate monitors. The images interpret the data that was recorded over several weeks into multilayered drawings that document spatial variations and experiential qualities in the landscape that were originally perceived unrenderable.

Only select students enter school with an understanding of how to see their environment by looking with patience and allowing the landscape to reveal its nuances. Recent technological software and hardware advances in the classroom hinder the student's perceptual experiences of place and artistic creativity documenting it due to spending less time outside and more screen-time rendering generic images.

Reading the landscape gives us the ability to design living landscapes that provide us both unity and variety. For landscape architects, the most important step is to recognize and build upon the overall character of a site and to recognize that each element, every detail of the design, should reflect the processes that shape the place and its phenomena of experiences. Cross-disciplinary tools can be used to record the personal and environmental phenomena of place. When representing the data, the students were inspired by other artist's work and examined a hybridization of media and multi-view drawings that use images, dimensional data and annotate the relational meaning between these representational typologies when documenting spatial and experiential qualities in the landscape.



FIGURE 1. Hybridized mapping by Sheryl Fishel of Southern Louisiana's Sweet Olive Cemetery's changing density patterns, fluctuations of wet and dry moments and her walking experiences over the course of sixteen weeks with pencil, sketchbook, string and camera.



FIGURE 2. Photographic mixed media mapping of the Chenier ridge formations of Cameron Parish by Joan Long and hybrid mapping the Coastal Prairie hydrology the Elizabeth Anne Williams.

Students record the changing qualities of the landscape with both low and high technological tools introduced from a wider field of disciplines. The pencil and sketchbook catalogs, the camera and video lenses capture fleeting moments, GPS coordinates mark points and scribe lines between positions and heart rate monitors track the body's physical excursion in the landscape. The images interpret the data that was recorded over several weeks into a multilayered drawing that documents the landscape's spatial variations and experiential qualities.

Insertion

There are several ways to engage the landscape through the student's personal motility, site sensory methods and the creation of meaning through drawing as a generative force for understanding the tangible and intangible landscape. By requiring them to engage the landscape at multiple speeds and durations of time, they find a way to read landscape change and scale. By speeding through, walking from point to point, biking through the right of way, sitting still, listening, touching and tasting the humidity or salinity and feeling exposure, one begins to see the world as it is. As the students engage the landscape through sight, tactile senses and memory, they develop perceptual awareness and the ability to recall experiential phenomena of place. The projects were designed to develop the ability to look closely and attune design sensibilities to what is already there. It does not matter where they begin to explore or how each of the senses has the potential to reveal landscape experience, it is how deeply the student delved.

Driving Geological Territories 1

As an entry point into drawing, students are asked to tour the landscape via historic scenic byways and trails and to conduct photographic documentation through the windshield. It is a fast paced experience easily recorded with the digital cameras' rapid exposures and allows hundreds of photographs of the horizon to be taken while moving at 80 kph.

The representational method that works best at the vehicular scale is mapping, which is core to understanding 'site' in the field of landscape architecture. Recording windshield surveys with the camera lens while pinpointing exact locations with GPS locators linked to GIS metadata offers diverse strategies to design and reinvent the world. Overlaying the imagery and adjusting opacity speculates on the acceleration and accumulation of landscape experience. Various mapped orthographic projections that trace the landscape of Cameron Parish. The data collected over numerous driving tours become inventory of past and existing conditions by documenting spatial relationships through image, marking duration and tempo by layering dimensional data, as well as offering a projection of the student's understanding of the expansive landscape. (Figure 2)

Ordering Systems 2

Studying land patterns, settlement and agriculture on Bayou Teche, students were introduced to the idea that landscape can be understood by movement through space and the experience of time. The drawings choreograph the vehicle's movement by registering moments through photographic images, annotating destinations as points and marking distances. Due to the landscape's complexity, the students were urged to incorporate various views, angles or projections in the drawings. They used multiple drawing techniques to illustrate the often contradictory scales of time passing. Colour, line, tone, gradient, shadow, and the entire image can be used to compare distinct moments in time within a location. The drawing also describes the time scale by charting intervals, such as timeline measurements against a constant datum line to help the student understand the variety of changes happening in one aspect of the site, marking progression of geological shifts, ecological succession, on littoral edges. A sequence of images illustrating intervals of the same object, space, or context can provide a deeper understanding of these multi-scalar moments and the motion and accumulation of landscape experience. The drawings tell a story about the particular landscape features that contribute to the spatial experience of the Bayou.

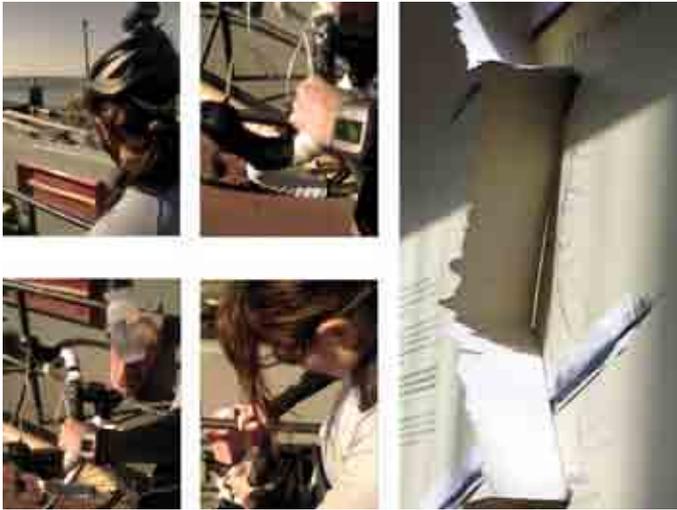


FIGURE 3. Biking the Chenier Ridge across the Cajun Prairie, Cameron Parish, Louisiana, with helmet video gear and heart rate monitor. Exhibition images by Louise Cheetham Bordonon.

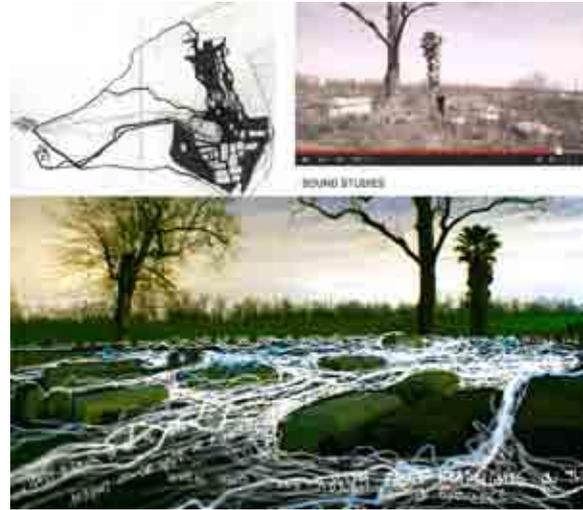


FIGURE 4. Matt Reylea traces his movement in the rural Erinville, Louisiana's Alford Cemetery by layering GPS data, video and sound recordings into hybrid images that chart his experiences.

Biking Geological Territories 3

Cheetham biked 130 kilometers of the Cajun Nature Trail along the Gulf coast. She recorded the linear trip with a video camera, GPS locators, speedometers and a heart rate monitor. She interpreted her GPS positions and mapped data into a three dimensional drawing that documented the spatial and experiential qualities of the prairie landscape she perceived. Her work was inspired by founding GPS line-art artist Jeremy Wood's White Horse Hill project in the United Kingdom. This project translated GPS locators and heart rate data to monitor the artist's physical assertions as he traversed the rural hillside for 43 kilometers and mapped it into a three dimensional model. (Figure 3)

Walking Ordering Systems 4

When walking a site the theory of parallax (the effect whereby the position of an object appears to differ when viewed from different positions) is examined. What David Hockney calls the 'rotating eye, rotating head' registers a landscape from multiple angles, positions and how closely one inserts himself. By walking, sitting, looking, touching and practicing quiet immersion, equipped with a tripod and remote timer, Reylea incorporated parallax into time-lapse photography sequence and digital sound recordings while simultaneously running a separate GPS locator to mark his walking path. Building upon the work of Jeremy Wood, Reylea created a set of images that combine photography and hand sketches and translated the GPS data into drawings similar to notational dance charts that were combined with annotated time-lapse photographs that traced his movement. (Figure 4)

Conclusion

Today, landscape architecture students arrive with new skillsets and easy access to low and high technology from sketchbooks to GPS trackers, tools from the design disciplines, sciences and entertainment industry. Access to and knowledge of these tools is only the beginning; students must then insert themselves into the landscape and apply these tools in the creation of hybrid multi-view drawings. These tools offer a way for students to engage their senses and learn to read the landscape while driving, walking or even sitting still. If this immersion does not occur, design and creativity in the field will likely become more generic as the profession's primary tool, digital software, produces ever more prosaic images.

References

- Allen, Stan. 2003. Mapping the Unmappable on Notation. In: S. Allen and D. Agrest, eds. *Practice: Architecture, Technique and Representation*, London; Routledge, 2003, 31 – 46.
- Corner, James. 1999. Agency of Mapping in: D. Cosgrove, ed. *Mappings*, London; Reaktion Books, 1999. 213-252.
- Marshall, Cathy Soergel. 2008. Seeing the Landscape Breathe. *Journal of Landscape Architecture*, Catherine Dee, ed. vol.6, 46-53.

The Is-Ought Gap: A Door Opener for Teaching Ethics in Landscape Planning

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ethics | landscape planning | is-ought gap | utilitarianism | theory of justice

The article presents an approach to teaching ethics in landscape planning. It demonstrates that seemingly factual questions of landscape planning imply normative and evaluative propositions. The example of a wind turbine site selection illustrates how David Hume's remarks on the is-ought gap can highlight the connection between practical questions of landscape planning and ethical theories like utilitarianism and John Rawls's Theory of Justice.

1 Introduction

This paper presents a concept for teaching ethics in landscape planning. This concept begins with practical, tangible questions instead of beginning with ethical theories. The reason for this approach is didactical: a concept that begins with ethical theories might face the difficulty of explaining why ethical theories are important for students of landscape planning. In contrast, practical questions stimulate students' interest in the subject. Being aware of the is-ought gap whilst exploring practical questions will lead to the ethical questions. Ethical questions also call for answers. It is worthwhile finding out what ethical theories can contribute to landscape planning. We begin with an example: the selection of a site for wind turbines.

2 Ad hoc Judgement

The students are given some information on potential sites for wind turbines, and have to choose the most suitable site. They form teams who have to make a preliminary decision and give reasons for their decision. This ad hoc judgement shows the students that many questions will have to be considered before a final decision.

The students have to prepare two lists of open questions. One list covers the ethical questions and the other list the empirical questions. Typically, the students find it difficult to specify ethical questions. Sometimes they find none. But they find it easy to specify empirical questions. The empirical list will be long and we single out two typical questions.

1. Which site is already degraded by infrastructure facilities?
2. Which site is the most efficient one in terms of wind availability?

	Argument A	Argument B
Descriptive Presupposition	This site <i>is</i> already degraded by infrastructure facilities.	This site <i>is</i> already degraded by infrastructure facilities.
Normative Presupposition	We <i>ought</i> to concentrate infrastructure facilities in order to preserve areas of unspoiled nature.	For reasons of fairness infrastructure facilities <i>ought</i> to be distributed equally.
Conclusion	We <i>ought</i> to build the wind turbine at this site.	We <i>ought not</i> to build the wind turbine at this site.

TABLE 1. Different conclusions despite an identical descriptive presupposition

3 The Is-ought Gap

It may seem that once the empirical questions have been answered, we can easily identify the best site. In relation to “deteriorated sites” the argument is as follows:

Argument A

Presupposition: This site is already degraded by infrastructure facilities.

Conclusion: We ought to build the wind turbine at this site.

The Scottish philosopher David Hume (1739-40/1960: 469-470) teaches that this argument is logically imperfect. He highlights the difference between is and ought. He found that the authors of moral systems first proceed “in the ordinary way of reasoning” using is and is not and then all of a sudden use ought and ought not in their propositions. The direct conclusion from facts to norms is criticized as is-ought fallacy. The argument above, is an example for such an is-ought fallacy. The presupposition uses is, and the conclusion contains ought. The is-ought fallacy can be explained with an analogy: to mix an alcoholic cocktail you need at least one alcoholic ingredient. Pina Colada contains rum, pineapple juice, and coconut cream. If you have no rum, you can only mix a Virgin Colada. Analogously, the propositions of a normative conclusion must include at least one norm. Otherwise the conclusion is logically defective.

The above argument A is incomplete. It has no normative presupposition, but draws a normative conclusion. We can easily complete the missing normative presupposition: “We ought to concentrate infrastructure facilities in order to preserve areas of unspoiled nature”. Now argument A is complete. Of course we can also introduce a different normative presupposition: “For reasons of fairness infrastructure facilities ought to be distributed equally” (Argument B). This will lead to a very different conclusion. Table 1 shows that the same descriptive presupposition may lead to different conclusions.

The analysis of the arguments may seem a little pedantic. But it is necessary: it illuminates the implicit normative content of an assumedly empirical question. Now we have an obvious ethical question: which normative presupposition is more substantiated, A or B?

Question 2 “Which site is most efficient in terms of wind availability?” also lacks the normative proposition. The implicit normative proposition probably is: the most efficient site ought to be preferred.

4 Ethical Theories Behind Normative Presuppositions

Normative presuppositions must not just be stated, but have to be substantiated. The claim in argument B is: “For reasons of fairness infrastructure facilities ought to be distributed equally”. The claim resulting from question 2 is: “The most efficient site ought to be preferred”.

A plea for the most efficient solution is usually based on an ethical theory that goes back to the English philosopher Jeremy Bentham (1789/1907). The central idea of utilitarianism is that decisions should be made on the basis of the greatest happiness of the greatest number. In a utilitarian view the sum of happiness is the most important objective. Fairness is also relevant but only as means to maximise the sum of happiness. This may even require a disproportionate distribution of burdens to increase the sum of happiness. Imposing a high burden (e.g. wind turbines) on few persons at efficient sites will bring about a higher yield of electricity. If the choice of efficient sites raises the sum of happiness, utilitarianism will lead to a disproportionate distribution.

Argument B claims an equal distribution of the burdens that wind turbines bring about. Provided that all persons benefit to the roughly same extent from electric energy, fairness demands that they have to accept the same burden of infrastructure, in this case wind turbines. If the sites for wind turbines were chosen on the basis of an equal distribution of burdens instead of efficiency-criteria, efficiency would drop. We have a conflict of objectives between equal distribution and efficiency.

The American philosopher John Rawls provides a solution for this conflict. In his Theory of Justice (1971: 302) he suggests the Difference Principle. This principle demands that “social and economic inequalities are to be arranged so that they are [...] to the greatest benefit of the least advantaged [...]”. The example of distributing a cake explains the idea behind Rawls’ Difference Principle. On one condition it is preferable to receive the smallest piece of an unequally divided, but big cake instead of a piece of an equally divided but small cake: the unequal piece has to be bigger than the equal piece. In our example of a site for wind turbines the neighbours of the wind-efficient sites are the least advantaged because they suffer from the turbines. But efficient sites lower the costs of electricity for them as well. An unequal distribution is justified as long as the advantage of an efficient site is higher for the neighbours than the

disadvantage of an unequal distribution is for them. If we focus on wind turbines alone, many neighbours of wind turbines might prefer higher electricity prices. But the neighbours of wind-turbines also benefit from other unequal distributions of infrastructure like motorways, waste incineration plants or airports. This improves the chances for an unequal distribution to be acceptable even for the least advantaged.

5 Conclusion

To place emphasis on the gap between is and ought opens the door for ethical considerations. Seemingly factual questions may imply normative or evaluative propositions. The attention to the is-ought gap highlights for example the questions of distributive justice which are omnipresent, but often not fully considered in landscape planning decisions. We should address the normative questions explicitly and discuss them with our students.

References

- Bentham, J., 1789/ 1907. An introduction to the principles of morals and legislation. Oxford: Clarendon Press, 1907. Internet: <http://oll.libertyfund.org/titles/bentham-an-introduction-to-the-principles-of-morals-and-legislation>.
- Hume, D., 1739-40/ 1960. A treatise of human nature. Reprinted from the original ed. in 3 volumes and edited with an analytical index by L.A. Selby-Bigge. Oxford: Clarendon Press. Internet: <https://archive.org/details/treatiseofhumann01humeoft>.
- Müller, A., In preparation. Ethik in der räumlichen Planung. Eine Einführung für Studierende und Praktiker der Raumplanung, Landschaftsplanung, Stadtplanung, der Architektur und Landschaftsarchitektur.
- Rawls, J., 1971. A theory of justice. Cambridge, Mass. Harvard University Press.

The Lure of the Australian Outback: Designing in the Field and on the Road

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fieldwork | remote landscapes | ruins | design

Fieldwork can provide distinct benefits for landscape architectural education. In addition to gathering data, 'the road-trip' to remote landscapes can be powerfully evocative. Films, books, documentaries and the like often depend on remote journeying as a ploy for capturing imagination in the construction of enthralling narratives. How can the imaginative potential of journey be harnessed in landscape architectural education? This paper argues that travel to the Australian outback can provide personally empowering experiences and result in productive outcomes in the creative environment of the design studio.

Introduction

In a world constrained by Occupational Health and Safety controls the ability to take students to remote or isolated places presents certain challenges. For some, the tendency has been to restrict fieldwork to locations within the city, or to use the campus as a laboratory for outdoor learning. However, fieldwork beyond the bounds of urban environments and into rural, remote or marginal landscapes offers forms of experience that can empower and inspire a designer in unique ways. Such travel can generate narratives multivalent in quality – they can be romantic, nostalgic, or involve daring, rebellion, and the fear or excitement of the unknown; they can be shaped by the history, provoke reflection, be poetic, involve sequence and linearity, or cycles and ritual, and more. The aim of this paper is to briefly reflect on theories and precedents that link travel and fieldwork with the production of creative ideas. It will use fieldwork undertaken in Woomera, a remote town approximately 1300km northwest of Melbourne in the South Australia arid region, as a case in point.

Fieldwork and Remote Places

Journey to remote arid places in Australia invariably takes one far from the city. Such places often seem relatively devoid of urban or cultural expression, the quality of their landscapes casting them into the realm of 'nature'. The experience of nature or wilderness is a vast topic crossing into many different themes (Oelschlaeger 1991). Natural places are not easily defined, even when categorisation is as broad and inclusive as that proposed by John Dixon Hunt (2000) who suggested three categories of nature as: wild and undisturbed; agriculture, cities and other built forms; and, as garden. The remote site of Woomera is set within a natural context, but is also inclusive of post-industrial relics in a ruinous state thus defining it as 'nature as wild - and disturbed'. Accepting that such landscapes partially come under the realm of 'nature', Knopf's typology for the values of natural



FIGURE 1. Ritualistic return: student painting during the mobile studio project outside Woomera's defunct detention centre for illegal immigrants in 2010. Photograph: A Saniga



FIGURE 2. Cultural relics of Woomera become a part of a landscape of encroaching indigenous vegetation. Watercolour by Joanne Nataprawira, 2010.

environments is useful. He suggested that as well as symbolic, restorative, and recreational values, experiencing nature builds peoples' competence (Knopf 1987: 786-789). Experiencing remote natural landscapes potentially broadens knowledge and awakens curiosity in the unfamiliar, building self-belief and camaraderie, elements essential in fostering creativity (Leak 2003: 7).

Neglected places can serve as powerful catalysts for reflection, confronting a viewer with a sense of abject failure. As Palsson argued, in semi-natural landscapes far removed from urban or developed areas, contemporary ruins or places of dereliction can communicate the history of a landscape's formation, blurring nature and culture, and allowing the mental space and energy for imaginative interpretation (Palsson 2013: 174-176). The way in which ruins are discovered – the time of day, unfolding journeys, sequential experiences and other circumstances involving the body in space – can impact on formulations of meaning. Reflection on the origins of form and a site's constituent parts was perhaps most tellingly

demonstrated via earthworks artists such as Robert Smithson and Nancy Holt on sites that lay beyond the mediation of the city gallery (Grant and Holt 2012). The reciprocal processes of immersing and expunging, in the field and along the road, can be transformational (Crump 2016).

To Woomera, and Beyond!

Woomera was conceived in 1947 to play a role in the Cold War, housing and servicing defence and civilian personnel associated with the Anglo-Australian Long Range Weapons Project. Pioneering efforts in turning an arid landscape into an oasis were hallmarks for a nascent profession of landscape architecture in Australia (Saniga 2012: 62-66). Later Woomera played host to a detention centre for illegal immigrants placing it in the national political spotlight (Figure 1). Some argue that Woomera's heritage was developed by way of Cold War tourism. However, there are acute difficulties in managing heritage of this kind, a phenomenon shared by other such Cold War sites around the world (Cocroft and Thomas 2003: 263-269). In Woomera there is palpable abandonment – prefabricated



FIGURE 3. *Camouflage Car*, stage prop designed by Mary Sullivan (2008) and based her response to a crime fiction novel: Courtier, S. H., 1967. See *Who's Dying*. London: *Hammond, Hammond & Company*.



FIGURE 4. 'Terra Oddities Mobile Studio: box-trailer, painting, drawing, photography, sculpture, sound, video, claymation, drama, fashion and food'. Exhibition 19-30 July 2010, Wunderlich Gallery, University of Melbourne. Photograph: A Saniga.

houses, roads, parks and gardens – have been almost erased. The region's sparse population cling tenuously to the land, their personal stories of resistance and adaptation often remarkable. Fieldwork by students from The University of Melbourne have documented this remote settlement's downfall in parallel with recolonisation by the indigenous landscape of the surrounding arid Arcoona Plains (Figure 2).

Reconnaissance activities have inadvertently echoed those of the Centre for Land Use Interpretation which has made extensive documentation of defunct Cold War military sites in the USA (Coolidge and Simons 2006). Ruination has captivated students, providing striking contrasts with relatively progressive urban environments. Themes for design studios included narratives of survival in the outback, pioneering feats, indigenous cultures and nomadic existence, and even related creative fields such as crime fiction writing. For example, students designed in response to the 1960s novelist Sydney H Courtier who created a James Bond-like fiction clearly referencing the activities in Woomera at that time (Figure 3). Four studios carried out over a ten year period (2002, 2005, 2008 and 2010) have produced volumes of work, only a couple able to be presented here in photographs and captions. In order to analyse and interpret the destitute state of a fading cultural landscape they have forced connections between disparate yet subtly connected ideas, conflated one historic source with another in free-wheeling ways, added layers of complexity and witnessed narratives multiply.

The ultimate studio drew most literally on the culture of 'the road trip'. Students in 2010 were funded to buy a steel trailer upon which they designed and built a 'mobile studio' of plywood and found objects. Their design was a compact 'room' in which to store paints, paper and other useful things like cooking gear, a wine-rack, fold-up chairs and easels. The mobile 'travelling studio' became a kitchen, seminar room, bar – a catalyst for observation during a two week fieldtrip to document the ruins of Woomera. Many of their drawing sessions began at 5am, devised to use the spectacle of sunrise

in the desert, and the act of painting in darkness, as a ploy for immersion. Students mixed readily with people along the way, drinking in pubs, exploring sites of importance and expunging their familiar lifestyles from the city. They traversed nearly 3000km and upon returning to Melbourne developed design ideas through images, models, photographs and animation (Wise and Simmons 2010). Their mobile studio was dismantled and reassembled as a relic within a gallery space, a hinge for the students' designs on exhibition (Figure 4). The ensemble was hailed by gallery-goers for its sensorial rendition of a road trip through Woomera's vanishing historic fabric, somewhere far away in the Australian outback.

Conclusion

Creativity can be stimulated in different ways. Challenging forms of fieldwork engenders self-belief and confidence in one's creative potential. This paper has emphasised the possibilities that lie within interconnected realms of fieldwork, remote and ruinous landscapes, histories of natural and cultural landscapes, literature, film and an array of artistic genre. Ultimately, despite the stipulations of learning environments, fieldwork should embrace improvisation, risk-taking and making things up as one goes along, for this develops competence and resilience which are essential for survival.

About the Author

Dr Andrew Saniga is a Senior Lecturer in Landscape Architecture, Planning and Urbanism at the University of Melbourne. He teaches landscape history, landscape design and the conservation and management of heritage landscapes. His research is predominantly concerned with the history of landscape architecture in Australia and he has explored landscapes and infrastructure in cities as well as regional centres and remote towns. In 2011 Andrew was Guest Professor at the University of Natural Resources and Life Sciences, Vienna, and in 2012 he led a group of students to Lithuania. His book, *Making Landscape Architecture in Australia* (2012) won two Australian Institute of Landscape Architects awards: the 'Victoria Medal for Landscape Architecture' in 2013 and the 'National Landscape Architecture Award: Research and Communication' (2014). In 2016 he was awarded an Australia Research Council Discovery Project grant to examine the history of the modern Australian university campus.

References

- Cocroft, W. D. and Thomas, R. J. C., 2003. *Cold War: Building for Nuclear Confrontation 1946-1989*. Swindon [UK]: English Heritage.
- Coolidge, M. and Simons, S., 2006. *Overlook: Exploring the Internal Fringes of America with the Center for Land Use Interpretation*. New York: Metropolis Books.
- Crump, J, 2016. Discussion at the 53rd New York Film Festival after screening 'Troublemakers: The Story of Land Art' Accessed: 11 April 2016 https://www.youtube.com/watch?v=KkDwzD_4Z38&noredirect=1
- Grant, S. and Holt, N., 2012. Nancy Holt and Robert Smithson in England, 1969. In: *Tate Etc*, Issue 25, Summer 2012. Accessed: 11 April 2016 from <http://www.tate.org.uk/context-comment/articles/nancy-holt-and-robert-smithson-england-1969>.
- Hunt, J. D., 2000. *Greater Perfections: The Practice of Garden Theory*. Philadelphia: University of Pennsylvania Press.
- Knopf, R. C., 1987. Human Behavior, Cognition, and Affect in the Natural Environment. In: D. Stokols & I. Altman, eds. *Handbook of Environmental Psychology 1*. New York: Wiley, 783–789.
- Leak, G., 2003. *Performance Making: a manual for music workshops*. Strawberry Hills [NSW]: Currency Press Limited.
- Oelschlaeger, M., 1991. *The Idea of Wilderness: From Prehistory to the Age of Ecology*. New Haven: Yale University Press.
- Palsson, G., 2014. Situating Nature: Ruins of modernity as naturuperlur. *Tourist Studies*, 13-2.
- Saniga, A., 2012. *Making Landscape Architecture in Australia*. Sydney: University of New South Wales Press.
- Wise, E. and Simmons, D., 2010. The Brooch Claymation with narration by John Wolseley on YouTube. Accessed: 19 April 2016 https://www.youtube.com/watch?v=_NaFIO6ACTs

The Use and Value of Learning with Plants

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education | qualification | real-world encounter |
learning biographies | plant knowledge

Abstract: The use of investing into classical plant knowledge appears to dwindle in a time of unlimited availability of electronic encyclopaedic information and rapid taxon identification via portable devices. The concept of “usefulness” however is a difficult one in a context of higher education. On the one hand education is meant to lead to a qualification as a basis of a successful professional career. On the other hand, education is, beyond mere training, concerned with the development of well-rounded characters and autonomous personalities. This in turn has an impact on the graduate’s future work, particularly in view of the artistic dimensions of professions such as landscape architects. Developing classical plant knowledge as part of a comprehensive education is more than memorizing lists of names and features, which may be downloaded from a database. To reduce plant knowledge to such “data” means a reduction of the wider reality. Education needs real-world-encounters, directly dealing with living complexity and its many facets. The experience of colours, textures, structures, scents and other sensual cues weaves into the human perception of reality. Plants further have a plethora of ‘intangibles’ – stories and other links to aspects of cultural significance – rooted in them. These processes of exploring and experiencing the world, including its living organisms such as plants, are at the core of individual learning and are vital elements in learning biographies. The value of working towards classical plant knowledge in our time may be less in the plain identification, and other tasks that can be done by a computer now, but in educational processes involving sensual perception, the recognition of patterns, verbal description and a translation into action that shape our environment.

Plants Are More than ‘Material’.

Plant knowledge is essential to the gardener’s profession. Within the individual specializations of gardening however the work with plants has a rather different character. In the field that has probably the strongest impact on human experience of living and being, landscape gardening, and by extension landscape design, often uses plants like a “normal” building material. Humphry Repton’s (1752 – 1818) definition of a garden “*a work of art, making proper use of the materials of nature*” is echoed in modern texts that state, in the words of Robinson (2004) that “*To the designer, plants are like green building blocks that can be assembled to form living and changing ‘structures’ in the landscape*” (Robinson 2004). Doing so, however, there is a risk of a most fundamental difference to the inanimate materials as glass, steel and concrete being ignored: the fact that a plant is alive. Plants naturally have a habit to continuously change their size, form, often colour or scent may be something of a nuisance to designers who want to have a clear picture of what they are planning and how the entire design will look in the end. They may be surprised by the supposedly male ginkgo tree suddenly carrying an abundance of odoriferous fruit, or the *Pterocarya fraxinifolia*, once planted as a solitary tree turning itself into a small forest and thus re-designing the scenery itself to something quite different from what was drawn in the plan. Knowing a plant in order to use it in a designed landscape means therefore not only to know its common and botanical name, and its price, but being aware of its vitality and behaviours. As, according to Kolb (1984, p. 38) “*learning is the process whereby knowledge is created through the transformation of experience*” anyone working with plants will therefore have continuous learning experiences, that involve continuous surprises. As phrased by educator and naturalist Mary Farrand Rogers Miller (1868 - 1971!, 1916) “*Knowing plants is more important than knowing names*”.

Learning with and in the Presence of Plants

Plants in a build environment however do not only provide a learning experience for the designer and landscape architect, but also very much for the people who use and inhabit that landscape too. An obvious example is the design of learning spaces in educational institutions. In publications on learning spaces the role of materials and technology such as wireless, or "displaying artwork, artefacts, or research" is discussed (Oblinger 2006), yet the presence of non-human living beings such as indoor plants seems to play no major role in the discourse. The closest at hand are studies on gardens as learning spaces, which are thought – and in some cases proven – to lead to a number of desirable outcomes, such as strengthening the academic performance, improving the psychosocial situation. Exposure to natural environments has been shown to be mood-lifting and to support focus (Kaplan and Kaplan 1989), and even small doses of "green" appear to have a beneficial effect on wellbeing and thus improved learning. Notably, it has been found that not only the presence of any "living green" is effective, but that biodiversity in green spaces has a positive effect on psychological measures of well-being (Fuller et al. 2007). These insights suggest that learning with plants is of particular importance for landscape designers and gardeners as they may create valuable learning spaces for others. In these learning spaces then plants may be much more than "green wallpaper", but can be the very object of learning. Learning by encountering plants in build, designed areas is of particular importance given that in an urbanized society there is less chance to experience such encounters in natural environments, and several studies describe an ongoing alienation of society from living environments. This is particularly well studied in children, as famously shown to a wider readership in the book "Last child in the woods" in the United States (Louv 2005). A study that was dubbed as „Forest Pisa report“ found a declining ecological literacy, including a deterioration of plant knowledge in children in Bavaria. The causes are seen in reduced time spent in the outdoors, and less interaction with outdoor-experienced people.

Creating Gardens as Living, “Storied” Learning Spaces

While even most diligently designed artificial spaces are unlikely to fully surrogate for “wild” nature, they do offer starting points into learning on and with plants. First, engaging with and contemplating a plant is likely to be fostered if there is more to learn than just a name. There is a world of ecological knowledge and theory that can be illustrated by bringing representative plants into the garden as a learning space. “Discovery learning” is surely the most effective if indeed discoveries are made – which garden design and choice of plants can support. This may involve – climate permitting – a choice of most surprising organisms such as the hot lips plant *Psychotria elata* with its evocatively shaped flowers, or the “dancing” semaphore plant *Codariocalyx motorius* that can stir curiosity and invite searching for further unusual phenomena. Kaplan (1973) explored "mystery" as a predictor for environmental preference, which may suggest, that a space rich in unusual organisms is one where people will prefer spending time. Not every plant has features that are immediately striking as unusual, and some may become interesting only by additional information and “background

stories”. In the authors experience students typically show an interest in plants that have an easily recognizable "story" - for example the Chinese Redwood *Metasequoia glyptostroboides* as a case of a "living fossil" discovery, or the Ginkgo which intrigues with both dinosaurian and Goethean connections. Given that we - in the words of Cronon (1992) - "inhabit an endlessly storied world" that wants to be discovered and as we “learn in the pattern of stories” it is likely to add to both, plant knowledge and the appreciation of the green learning space to interweave it, perhaps aided with means of blended learning, with the natural history and the “stories” that a plant carries. The philosophy behind the design of green learning spaces may expand gradually to influence the design principles for public spaces that are not primarily part of an institution of learning, but are part of the public's everyday life and experience of their environment, and thus a potential element in their life-long learning.

References

- Cronon, W. 1992. A Place for Stories: Nature, History, and Narrative. *J Am Hist.*, 78(4):1347-76.
- Fuller, R. A., Irvine, K. N., Devine-Wright, P., Warren, P. H., & Gaston, K. J. 2007. Psychological benefits of greenspace increase with biodiversity. *Biology letters*, 3(4), 390-394.
- Kaplan, R. 1973. Predictors of environmental preference: Designers and clients. In W.F.E. Preiser (Ed.), *Environmental design research*. Stroudsburg, Pa.
- Kaplan, R, Kaplan, S. 1989. *The experience of nature: A psychological perspective*. Cambridge.
- Louv, R. 2005. *Last Child in the Woods: Saving Our Children from Nature Deficit Disorder*. Chapel Hill.
- Miller, M.F.R. 1916. *Outdoor Work*. Garden City, New York: Doubleday, p. 357.
- Oblinger, D. 2006. Learning how to see. In D. Oblinger (Ed.), *Learning spaces*. Washington, Boulder.
- Robinson, N. 2004. *The Planting Design Handbook*. Burlington, p. 16.

Sustainable Garden Design: Students' Perspectives in the "Flower of Life" International Competition

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garden design | garden design | mediterranean garden | planting design

This paper aims to bridge the gap between sustainability goals and site design in landscape architecture. It analyses the results of an international student garden design competition for the EXPO 2016 in Antalya, organised by the LE:NOTRE Institute. Participants of various design disciplines were invited to demonstrate how gardens can improve urban biodiversity, and to apply landscape architecture principles for planting design and hard landscaping that effectively contribute to greener cities and are most suitable for the Mediterranean urban context.

Sustainability in landscape architecture can be categorised according to the benefits of the "sustainability triangle". International student design solutions for a sustainable garden were analysed according to this framework. The main challenge was assessing to which extent the designs presented innovative and feasible solutions suitable for construction of sustainable urban Mediterranean open spaces. In parallel, key issues for teaching sustainable garden and landscape architecture were explored.

The conclusions stress the importance of integrated approaches in garden design, in order to achieve multiple environmental, social and economic goals and to create an improved functionality and innovative planting principles. Recommendations are presented for teaching sustainable landscape design.

Aiming for Sustainability

In 2015 the LE:NOTRE Institute organised the international student competition "Flower of Life" soliciting integrated holistic approaches to garden design. The winning entry is to be constructed at the EXPO 2016 in Antalya with the main theme being flowers and children in a more sustainable future.

Participants of various design disciplines were invited to demonstrate through their design how gardens can contribute to a higher biodiversity, and to apply landscape architecture principles that effectively contribute to the development of greener cities. They were asked to present innovative concepts of hard landscaping and planting design that are more sustainable, e.g. by closing of cycles, adapting to climatic circumstances, and efficient water management.

Students were asked to demonstrate how the suggested sustainability measures could be understood and experienced by the visitors.

Students from 19 different countries submitted 34 entries: Belgium, Brazil, Bulgaria, Canada, China (5), Croatia, Czech Republic, France (2), Germany (6), Hungary, Indonesia, Iran, Italy, Poland (4), Portugal, Romania, Turkey, United Kingdom, and the USA (3).

Sustainability Framework

The European Commission (2013) links the benefits of green infrastructure to the aims of sustainability and presents a broad range of benefits. CABE (2005) and other authors (Andreucci 2015) discuss the importance of parks for a sustainable development of cities and illustrate the benefits with a series of case studies for healthier lifestyles, sustainable urban drainage, space for relaxation, sustainable transport, and promoting economic development. They stress the importance to design with dynamic natural processes. The main benefits can be

Table 1. Competition goals (left) related to the aspects of sustainable landscape design (right)

Goals of the competition <i>Flower of Life</i> *)				Aspects of sustainability **)		
				Social – People	Environmental - Planet	Economic - Prosperity
Green cities	Concepts for planting design	Concepts for hard landscaping and construction	Water management	1. Planting design for attractive environments	7. Continuity in time: heritage and identity	14. Planting low maintenance
				2. Attractive hard landscaped environments	15. Hard landscaping low maintenance	
				3. Good microclimate & well being	8. Closing of water cycles	16. Recycling and upcycling
				4. Innovative systems: vertical planting etc.	9. Reducing waste	10. Reducing pollution
Urban biodiversity	5. Enhancing nature experience	11. Biodiversity indigenous species	17. Productive landscapes: local food			
	12. Biodiversity variety	13. Planting adapted to ecosystem				
6. Participation & involvement of people	18. Renewable energy, carbon reduction					

*) Source: Competition brief Flower of Life, version 6th of October 2015
 **) Reference: Adriaens 2010; Munasinghe 2008; NVTL 2015

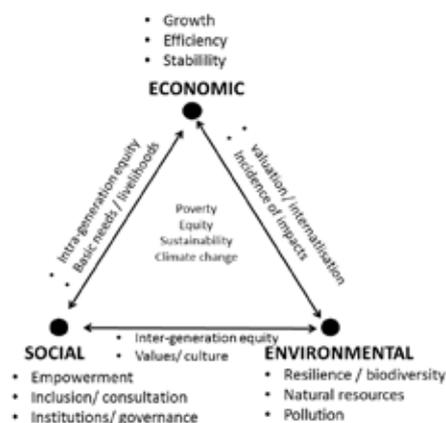


FIGURE 1. Triangle of sustainable development – Key elements and relations. (Munasinghe 2008)

TABLE 1. Competition goals (left) related to the aspects of sustainable landscape design (right).

Table 2. Number of times that aspects of sustainability were addressed in the entries

Aspect	Times	Aspect	Times
1. Planting design for attractive environments	15	10. Reducing pollution	0
2. Attractive hard landscaped environments	6	11. Biodiversity indigenous species	25
3. Good microclimate & well being	3	12. Biodiversity variety	23
4. Innovative systems: vertical planting etc.	5	13. Planting adapted to ecosystem	22
5. Enhancing nature experience	25	14. Planting low maintenance	9
6. Participation & involvement of people	4	15. Hard landscaping low maintenance	2
7. Continuity in time: heritage and identity	3	16. Recycling and upcycling	4
8. Closing of water cycles	6	17. Productive landscapes: local food	10
9. Reducing waste	0	18. Renewable energy, carbon reduction	2

TABLE 2. Number of times that aspects of sustainability were addressed in the entries.

represented through the “sustainability triangle” (Munasinghe 2007) emphasising three sustainability pillars: environmental, social and economic. (Figure 1)

In order to develop a framework that is suitable for landscape architecture, focus was needed on the kind of measures that are related to spatial planning and design. International landscape architects (Adriaens 2010; NVTL 2015; IFLA World Congress 2016) recently highlighted some of the most relevant sustainability themes that can be improved by effective landscape design:

- Fostering well-being by involvement and participation of the public.
- Providing a good microclimate and a safe environment;
- Reducing soil depletion and use of available water resources.
- Improving accessibility by multi-layered traffic and transport systems.
- Organising efficient resources maintenance and coordinated management of outdoor space.
- Promoting ecological connectivity and native biodiversity.
- Recycling and upcycling of materials.

- Applying renewable energy and closing of cycles.

For all those aspects an integrated approach leveraging on landscape character and cultural history, as well as including the aspect of development over time is required.

On the basis of the above presented sustainability themes a framework of the analysis of the entries has been developed, presenting 18 sustainability themes that can be addressed by landscape design. (Table 1)

Analysis of the Entries

The entries mainly focused on enhancing biodiversity and creating attractive interactive open spaces for people and especially for children. (Table 2)

That the full extent of the theme of green cities was hardly explored is evident because the themes of reducing waste and pollution were not at all addressed, and the themes of renewable energy and carbon reduction and a good micro-climate only a few times. There were some good examples of the use of upcycled material in hard landscaping and the constructions of the pavilion. The innovative aspects mainly consisted of the



FIGURE 2. Entry #148 – Plan of beBee the pavilion; hexagonal forms referring to beehives - first prize.



FIGURE 3. Entries #164 and #179: Plug-in garden, interactive planting and monitoring of the environment - 2nd prize and Pamuk Kale Cultural reference to the production of cotton - 3rd prize.

application of aeroponics with ornamental or edible plants. The focus on biodiversity was expressed by the use of plant species that are indigenous in the region, in Turkey or the Mediterranean area. Sustainability in planting was enhanced by using plants that are drought resistant and therefore require less water resources and maintenance. Nature experience mainly originated from the use of plants that attract birds, butterflies, bees and other insects. The closing of water cycles was in several designs mentioned, but only in a few well elaborated. Some offered high tech solutions for a water system and others made use of traditional solutions with natural infiltration and catchment areas.

Only three entries fully engaged in the participation of the people. Two did this by offering the possibility of planting the garden; others proposed interactive panels or mission cards.

Winning Designs

In “beBee the pavilion” Zuzanna Banaś and Irene Jackson Gil (#148) addressed the aims of the competition in an integral way. The concept of bees representing biodiversity is consistently developed in the architecture of the pavilion and fences, in hard landscaping and planting design. The concept can be well perceived by visitors. It offers variety in experience for children and adults alike. It makes use of renewable material and drought resistant planting. (Figure 2)

Marta Matynia and Paweł Gałeczka (#164) propose with a “Plug-in garden” an interactive garden with a monitoring system of the effect on sustainability. Visitors can participate by planting plug plants. The pavilion monitors the amount of oxygen and shines like a lantern when it is dark. Hard surfacing is reduced to a minimum. The plant selection reflects well the seasons in the Mediterranean landscape.

Alexandre Marguerie and Camille Dèlegue (#179), highlight in an evocative way the mountain area of “Pamukkale and the growing of cotton”, an important crop in Turkey. It is designed like a terraced garden with cotton species from different regions and dyeing plants. It offers a varied experience to the visitors and has educational value. The continuity in time with a reference to the agricultural landscape and traditional craftsmanship is an important aspect of sustainable design. (Figure 3)

Conclusions and Recommendations

The analysis of all entries resulted in the following conclusions:

1. In general the entries did not display a complete understanding of the full extent of the concepts of green cities and sustainable design. In many cases only a few aspects were addressed.
2. The entrants did not fully explain how their design contributes to enhancing sustainability. The explanations were often quite general and implicit and did not explain how the impact was produced.
3. The designs often focused on one concept and did not present integral solutions for sustainability. While it is important to have a clear and strong concept to convey a message, it is required to elaborate other aspects of sustainability in the design.
4. The entrants did not fully clarify how processes or systems worked. This was the most evident with the water cycles. Especially with sustainability it is important to understand and clarify how the processes in a design actually work.

Recommendations for teaching in order to bridge the gap between sustainability goals and landscape design are:

- a. All courses should give an overview of sustainability and explain to which aspects landscape architects and other spatial planners can contribute by their plans and designs.
- b. Each programme should include competences for sustainability.
- c. Students should learn to approach the concept of sustainability in a process oriented way and to design not only the spatial structure but also the systems of water, matter, waste and other cycles.
- d. While communicating a design concept the students should always develop their plan in an integrative way, addressing social, environmental and economic aspects of sustainability.

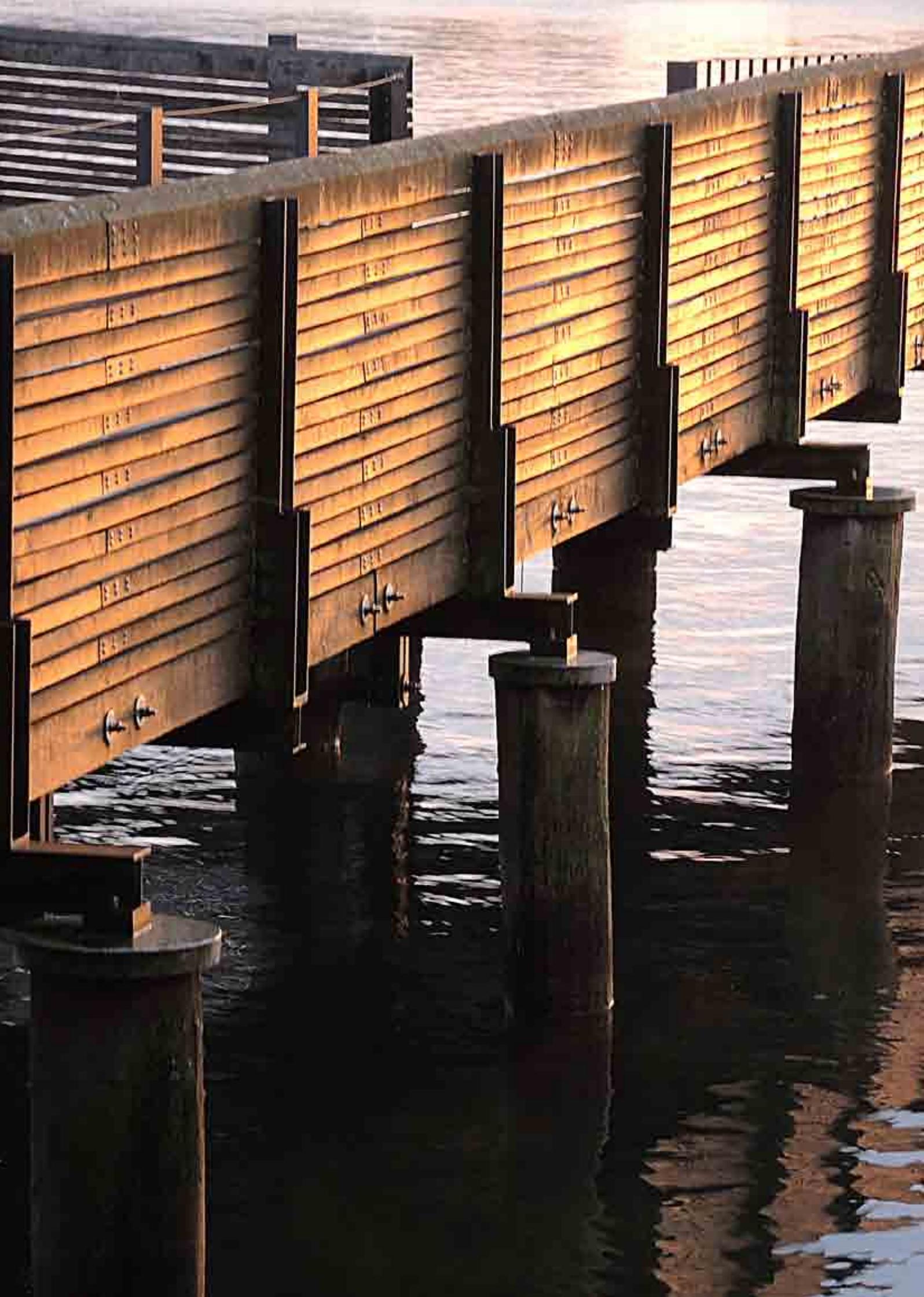
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We thank all students who submitted a design, the jury and the Antalya EXPO 2016. All entries and information can be found on: <http://ln-institute.org>.

References

- Adriaens, F., et al., 2010. Sustainable urban design, The Next Step. Blauwdruk publishers, Wageningen.
- Andreucci, M. B., 2015. Green Infrastructure. Theories, Evidence, Values and Tools for urban resilience. Sapienza Università di Roma, Planning Design Technology of Architecture Department.
- CABE Space, 2005. Start with the park: Creating sustainable urban green spaces in areas of housing growth and renewal. CABE Space, London.
- European Commission, 2013. Green Infrastructure (GI) (COM(2013) 249 final)
- Tasting the Landscape, 2016. 53rd IFLA World Congress. Turin 20-22 April 2016. Florence: Edifir Edizioni.
- Munasinghe M., 2007. Making Development More Sustainable: Sustainomics Framework and Practical Applications. <http://www.mindlanka.org/sustainomic.htm>
- NVTL, 2015. Duurzame Landschapsarchitectuur (Sustainable Landscape Architecture), Blauwdruk, Wageningen.

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Posters

JOÃO ESCOLÁSTICO¹; ISABEL MARTINHO DA SILVA¹; JOÃO QUINTÃO²

1 - School of Sciences, University of Porto

2 - Camâra Municipal de Matosinhos

Rescuing National Road 12

BEATA FORNAL-PIENIAK; EWA ZARAŚ-JANUSZKIEWICZ

Warsaw University of Life Sciences, Poland

Evaluation-Useful Method for Distinguished Types of Landscape Values

INGRID SARLÖV HERLIN

Swedish University of Agricultural Sciences, Sweden

The Return of Urban Agriculture and the City Landscape

TONGBIN QU

Texas A&M University

The Application of Digital Storytelling on Study Abroad Learning

EVITA ZAVADSKA

Latvia University of Agriculture, Latvia

Environmental Design Objects as Mediators Between Nature and Community

Location of RN12



Abstract

The Portuguese National Road 12 (NR12), also called Oborvalvação Road, is one of the main distribution roads of the Porto Metropolitan Area. It connects the Atlantic seafloor to an interior stretch: of the Douro river, and runs along four different counties: Porto, Matosinhos, Maia and Gondomar.

The main problems affecting the NR12 are: i) a lack of identity due to high variation in its cross-section, ii) the barrier effect it creates in the urban fabric; and iii) the dominance of motorised vehicles over other type of users.

This work presents a proposal to transform the NR12 into an urban road integrated in the surrounding urban fabric. The main goals of this proposal are: i) to create a coherent cross-section along the 17 km of the NR12; ii) to promote soft mobility, namely through the introduction of sidewalks and cycle lanes; iii) to integrate the NR12 in the Porto Metropolitan green infrastructure through the creation of a central green corridor, the introduction of street trees along the sidewalks, and the proposal of links with nearby green areas; and iv) to improve the visual quality and identity of the road through the adoption of an uniform pavement and urban furniture.

The assessment and proposal was done for the 17 identified stretches along the NR12. Each stretch corresponds to a significant variation of the NR12 cross-section. For each stretch we present the current and proposed situation, namely the existing and proposed cross-section, a photographic series of the existing situation, and proposed intervention measures.

Methodology



Synthesis



Analysis

1 Main distribution roads of the Porto Metropolitan Area (PMA)

2 Green structure along the NR12 (within a 1km buffer)

3 NR12 Segmentation

Proposal

1 Proposal for the 17 segments identified along NR12

2 Proposal views

Evaluation- useful method for distinguished types of landscape values



Abstract:

High natural values of landscape elements are very important for development touristic and recreation. For example forests as a key touristic and recreational resource are an integral component of the tourism product together with accommodation, transport facilities and service infrastructure. Natural and cultural values are the main potential aspects for development of rural communities. It was presented landscape evaluation method focus on classification values of landscape as attractiveness and usefulness for tourism. It was done example of evaluation of the Nasielsk commune in Poland and distinguished few types of landscapes. This stage of works is very important for formulated directions for Nasielsk landscape shaping in tourism aspect.



Introduction

Landscape evaluation is very important and usefulness method for characteristic of natural, cultural and visual elements (Mazurski, 2012, Myga-Piątek 2007, Żarska 2012, Żarska, Fornal-Pieniak, Zaraś-Januszkiewicz 2014). There were presented many evaluation methods focused on quality of landscape elements as LANDEP method (Landscape Ecological Planning), GEM (*General Ecological Model*). The whole stages of landscape evaluation depend of the main purpose of research. Is it will be doing for tourism or protection aspects? Proper selected criteria of landscape evaluation are first success of this method.

The main purpose of this article is landscape evaluation for tourism aspect on example of Nasielsk commune.

Methodology

Methodology is included fields and indoor studies. It was recognized natural and cultural elements and prepared selected criteria of evaluation as diversity of plant communities, naturness of vegetation, protected forms, water surface, Natura 2000 habitats, vegetation available for recreation, number of historical buildings and diversity of culture elements.

Landscape evaluation was included division of study area into landscape special units, formulated criteria to assessment, scale of values. Scale of values was characterized by points from 1 to 5 points.

Bonitation points:

- 5 point – very high values/occurring
- 3 - 4 points – high values/occurring
- 2 points – medium value/occurring
- 1 point – low value/occurring

The last stage of analysis was distinguished areas with different landscape values. Areas was classified into three groups: areas with high natural and cultural values (above 10 points), areas with medium natural and cultural values (from 5 to 9 points), areas with low natural and cultural values (from 1 to 4 points).

Results

Different types of special-landscape units were distinguished in Nasielsk commune. They are represented by forests (59 units), river valleys (2 units), settlements (14 units) and agriculture units with mosaic of fields, pastures and meadows (29 units).

The most valuable special-landscape units are represented by river valleys, forests and one agriculture unit (A23) with share of groups of trees and small agriculture ponds with water and rushes vegetation. Riparian forests, water and rushes plant communities are dominated in river valleys. These units are the most valuable in studied area. Only one protected form as ecological ground is located on the south part of Nasielsk commune (A23).

Division of Nasielsk commune into special-landscape units (authors: Fornal-Pieniak, Zaraś-Januszkiewicz 2016)



Landscape evaluation - results

Criteria	F1-F59	F45	A1-A29	A23	S3-S14	S1	S2	RV1-RV2
Diversity of plant communities	2	2	3	3	2	2	1	5
Naturness of vegetation	5	5	3	3	1	2	2	5
Protected forms*	0	0	0	1	0	0	0	
Water surface	0	0	0	2	0	0	0	4
Natura 2000 habitats*	0	1	0	0	0	0	0	
Vegetation available for recreation	3	3	2	2	2	1	2	4
Historical buildings	0	0	0	0	1	2	1	0
Diversity of culture elements	0	0	0	0	1	2	2	0
Sum	10/I	11/I	8/II	11/I	7/II	9/II	8/II	18/I

*1 point/if occurring, 0 point if no occurring
 F – forests special-landscape units
 A – agriculture special – landscape units with share of fields, pastures and meadows
 S – settlement unit
 RV – river valley unit

Areas with different values and availability for touristic aspect:

- I – areas with high natural and cultural values for recreation (above 10 points) – 62 special-landscape units**
- II- areas with medium natural and cultural values for recreation (from 5 to 9 points) – 43 special landscape units**
- III–areas with low natural and cultural values for recreation (from 1 to 4 points) – non**

Conclusions

Landscape evaluation is very useful and important stage of landscape analysis for proper management, for example for touristic aspect. It was achieved 62 special landscape units with high natural and cultural values and 43 special landscape units with medium values. It was no areas with low landscape values. It is important that vegetation is diversified and many valuable and historical culture elements are located here too. Nasielsk commune is the rural areas with high potential of landscape for tourism.

THE RETURN OF URBAN AGRICULTURE AND THE CITY LANDSCAPE

Cities in the Global North are experiencing a boom in urban agriculture (UA). This poster highlights the multifaceted and multi-layered impact of UA on the city landscape, with the aim of increasing understanding of the interaction between (growing) food in urban areas and how cities are shaped by this relationship. Observations and reflections about UA are limited to the Global North and are based on the literature, reports and field visits. Changing perspectives on food and reactions to mass production are the main driving forces for the return of agriculture to the urban landscape.

INTRODUCTION

Sustenance agriculture for household food characterises the world's developing countries, but also in cities in the Global North there is a boom in urban agriculture. Within modern history, food growing in cities is discussed in relation to utopian planning ideals, food provision and food rights, self-sufficiency, education and rehabilitation, city branding, protest movements, environmental justice, heritage and integration. The question of UA for food security is currently more prominent in the UK and North America, while projects in Scandinavia are addressing social issues. Urban agriculture is defined by FAO (2016) as "the growing of plants and the raising of animals within and around cities" but there are also more specific definitions. The concept can either include peri-urban agriculture (PUA) or can distinguish itself as inter-urban agriculture (IA).

PRODUCTION OF FOOD IN THE CITY IN THE PAST

Food has, during history been produced in close proximity to cities, but also elsewhere. Food supply for Ancient Rome depended for example on a huge transport network around the Mediterranean. Whether the food travelled longer or shorter distances, the urban fabric was strongly shaped by the way food found its way there and how it was stored, processed, sold and consumed in the city.

TODAY'S DRIVING FORCES TO RECOGNISE VALUE IN FOOD

With the industrialisation, food production moved farther away and became disconnected from people's daily life for most of the 20th Century. In the late 1980s-early 1990s, renewed interest emerged in major cities, in growing healthier, local food, which triggered initiatives for growing food for consumption and sale.

WHY IS URBAN AGRICULTURE A CONCERN FOR URBAN PLANNERS?

UA creates a new urban structure where places for work and production are no longer separate from places for leisure and entertainment. It contributes to urban green infrastructure and the production of space and places within cities. It is used to regenerate socially problematic neighbourhoods and to increase value and attractiveness. As a land-based activity, UA and the space it requires are a major challenge for planners, although cultivation on roofs or within buildings is partially decoupled from land use. There is a need to consider that land used for UA can be of different types of tenancy or ownership, including private gardens and designated public, institutional or occupied allotments.



Between medieval times and the mid-1800s large areas of land near the town were cultivated (Sweden).



Urban common land was used in the past for pigs or dairy cows, providing income for women. (Newcastle Town Moor, UK).



UA can contribute to multifunctional landscape management, e.g. through production of meat from animals grazing on biodiverse and accessible areas with a strong cultural or historical identity.



US can take place on areas with a long continuity and identity of food production and a strong heritage, or on vacant land recently taken into use. (image www.sydsvenskan.se)



During the 19th-early 20th century, ideological initiatives such as allotments and 'Grow your own' movements materialised, promoting food-growing activities for the health and wellbeing of citizens. Campaigns during WWII such as 'Dig for Victory' in the UK and parallel activities in other countries contributed to wartime food provision. (image Geoff Charles www.flickr.com)



In the early 20th century, family-run market gardens, based on recirculation of urban wastes, were established in or nearby towns in Sweden. After WW2, their competitiveness decreased, and most had to close down. (image <http://digitaltmuseum.se/>)



Commercial UA manifests itself more than once in the city landscape, first during the cultivation of products on fields or in greenhouses, then in markets in open spaces or in market halls and perhaps also in the outdoor area of a restaurant. Market places for food also have a strong role in creating social meeting places, shaping the aesthetics of urban space and providing a direct link between producers and consumers.



Restaurants, recognised as leading drivers of food culture, are increasingly adding organic or 'locally sourced' products to their menus and the hippest restaurants are cultivating their own ingredients in special gardens.

FINAL REMARKS

Negative reactions to mass production and the role of food as a conveyer of community and shared values appear to be the main driving forces for the return of UA. Urban agriculture can help bridge the gap between urban and rural, between consumers and producers and between food as an industrial product and food as a carrier of place identity and local embeddedness or as a symbol of a more sustainable future. However, the extent to which urban agriculture is truly able to bridge social gaps remains a subject for future research.

REFERENCES

- Björklund, A. 2010. Historical Urban Agriculture: Food Production and Access to Land in Swedish Towns Before 1900. Stockholm: Acta Universitatis Stockholmiensis.
- French, H.R. 2003. Urban common rights, enclosure and the market. *Agricultural History Review* 51 (1), 40-68.
- Hall, C.M and Gössling, S. 2013. Reimagining sustainable culinary systems. In: *Sustainable Culinary systems. Local Foods, Innovation, Tourism and Hospitality*, Eds C.M. Hall and Gössling, S., (Routledge), pp. 293-304.
- Herzog, C. and Murray, J.P. 2013. Is 'local' just a hot menu trend? Exploring restaurant patrons' menu choices when encountering local food options. In: *Sustainable Culinary Systems. Local Foods, Innovation, Tourism and Hospitality*, Edited by C.M. Hall and Gössling, S., (Routledge), pp. 122-134.
- Olausson, I. 2014. En blomstrande marknad. Handelsträdgårdar i Sverige 1900-1950 med fyra fallstudier i Stockholms län. Acta Universitatis agriculturae Sueciae 27.
- Specht, K., Siebert, R., Hartsmann, I., Freisinger U.B., Sawicka, M., Werner, A., Thomaier, S., Henckel, D. and Dierich, A. 2013. Urban agriculture of the future: An overview of sustainability aspects of food production in and on buildings. *Agriculture and Human Values* 31, 33-51.
- Tornaghi, C. 2014. Critical geography of urban agriculture. *Progress in Human Geography* 1-117. Published online at <http://phg.sagepub.com/> (accessed 4/30/2016)
- Tregear, A. 2011. Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of Rural Studies* 4 (27), 419-430.
- Ovström, M. 2012. Om odling och växande städer. In: *Stadsodling – Reflektioner och perspektiv från SLU Alnarp*. Edited by T. Delshammar, Rapport 2012:31, pp. 13-16.

THE APPLICATION OF DIGITAL STORYTELLING ON STUDY ABROAD LEARNING



ABSTRACT

The purpose of the study is to bridge the gap between study abroad and typical classroom teaching by the application of digital storytelling. In summer 2015, we taught a summer abroad course in Germany and gave an assignment in which students produced their own 3-minute videos to reflect on their five-week learning and tell stories using their voice. We found that five out of 13 students have never produced a video before. Eight of them heard of "digital storytelling" but only three have done it before. Students compared digital storytelling with four other tools in terms of their effectiveness in reflecting the Germany experience including writing a paper, taking an exam, doing a team project and making a presentation. Digital storytelling was rated the most effective one among these assessment tools. Students also ranked seven different learning methods in helping them understand the subjects. The order from the most to least effective methods are: guided outdoor tours, host family, guided indoor tours, lectures in classroom, professional conference, interaction with classmates and personal tours.

GLOBAL EDUCATION

Tongbin Ou
Lecturer
Texas A&M Univ.

Ming-Han Li
Professor
Texas A&M Univ.

Ture Petersenn
Program Manager
AIB

Team Members:

REFLECTION

Average scores of comparison between digital storytelling and other assessment methods in terms of their perceived effectiveness in reflecting the Germany experience.

Assessment Methods	Average Score* (N = 13)
Writing a paper	2.45
Taking an exam	2.64
Making a 10-min final presentation	2.25
Doing a team project and turning in a final report	2.45

*: 1-better, 2-same, 3-worse

Average rankings of video-related tasks in terms of how helpful they were for reflecting the Germany experience.

Tasks	Average Score* (N = 13)
Storyboard (1 st draft)	2
Storyboard (final)	2.54
Writing the script	2.46
Reading the script (voice over)	2.64
Reviewing the photos/videos taken during the trip	1.54
Relating the actual experience to assigned readings	2.36
Reviewing classmates' rough cuts	2

*: 1-very helpful, 3-neutral, 5-not at all

HIGH IMPACT

CONCLUSION AND RECOMMENDATION

1. Current college students are capable of learning digital storytelling in a meaningful way and within a short amount of time.
2. Digital storytelling is a promising tool for reflecting study abroad experiences and is a suitable assessment tool in a study abroad setting, particularly for programs that are based on experiential learning strategies.
3. We recommend to landscape architecture to use digital storytelling to facilitate deep learning in landscape architecture courses.

An iPad will be added here during presentation.

ENVIRONMENTAL DESIGN OBJECTS AS MEDIATORS BETWEEN NATURE AND COMMUNITY

Evija Zavadska

Researcher, Latvia University of Agriculture, Faculty of Environment and Civil Engineering, Department of Landscape Architecture and Planning
Landscape architect, Ltd. ALPS

Artistic and creative interventions can be an instrument to increase the dynamics of the interaction between a place and community affecting environmental, socio-political, cultural and economic fields. One of the means to advance and preservation to the existing values of the ecosystem and its historical importance in the framework of social, cultural and natural heritage is to create environmental design objects (including installations, three-dimensional objects, and site-specific art). The environmental design objects, which are based on the features of the existing landscape, act as a filter for different interests and func-

tions. Here Martin Heidegger's idea of 'being-in' (Dasein) can be mentioned, since it embraces an exploratory approach to create new spaces, which can act as a creative means between the past and the future. In this paper we exemplify the process of one of the authors, namely site preservation for preservation of the conservation status and values of the ecosystems within an ongoing European Project "Assessment of Ecosystems and Their Genes for Nature Biodiversity Conservation and Management" which began in 2015 at Salduskrājs, Latvia (Salduskrājs Municipality).

The Pilot Implementation Area for the Project is located on the coastline of the Gulf of Riga between the sea and the urban area, as well as two river deltas. There are protected biotopes in the territory - wooded coastal dunes, a number of blue biotopes and nature sectors (of dunes, a wide beach and a significant object of natural capital - the White Dune). Approximately 30% of the territory is a built-up area. The White Dune has become a popular place for swimming, recreation, as well as for wedding ceremonies and small-scale performances. However, the area of the White Dune suffers from the coastal erosion caused by the river and from anthropogenic load caused by the visitors.

The Conceptual Framework of the Pilot Implementation Area M 1:5000



Nature is variable, cyclic and can be characterized as an ongoing process. Therefore, the question arises how to activate and tell about the changes and possibility of the nature with the help of creative means? How to preserve historical heritage and natural values, and at the same time introduce new and innovative features? Should the landscape be positioned in a stable and fixed form in the context of the cultural heritage preservation and protection?

The developed Prototype demonstration site works as one of the illustrative development scenarios. It is an innovative approach for the alignment of natural and human interests under sensitive environmental conditions. The Nature Design Park will serve as a proof that compromises are possible and the nature and human can coexist in a balanced relationship.

- (1) The conceptual framework of the Pilot Implementation Area and the Prototype is being developed in order to reduce and recover the ecosystem roles.
- (2) Educational, innovative, sustainable and multi-functional environmental design objects are developed to regulate the flow of visitors and to tell about the environmentally sensitive areas.

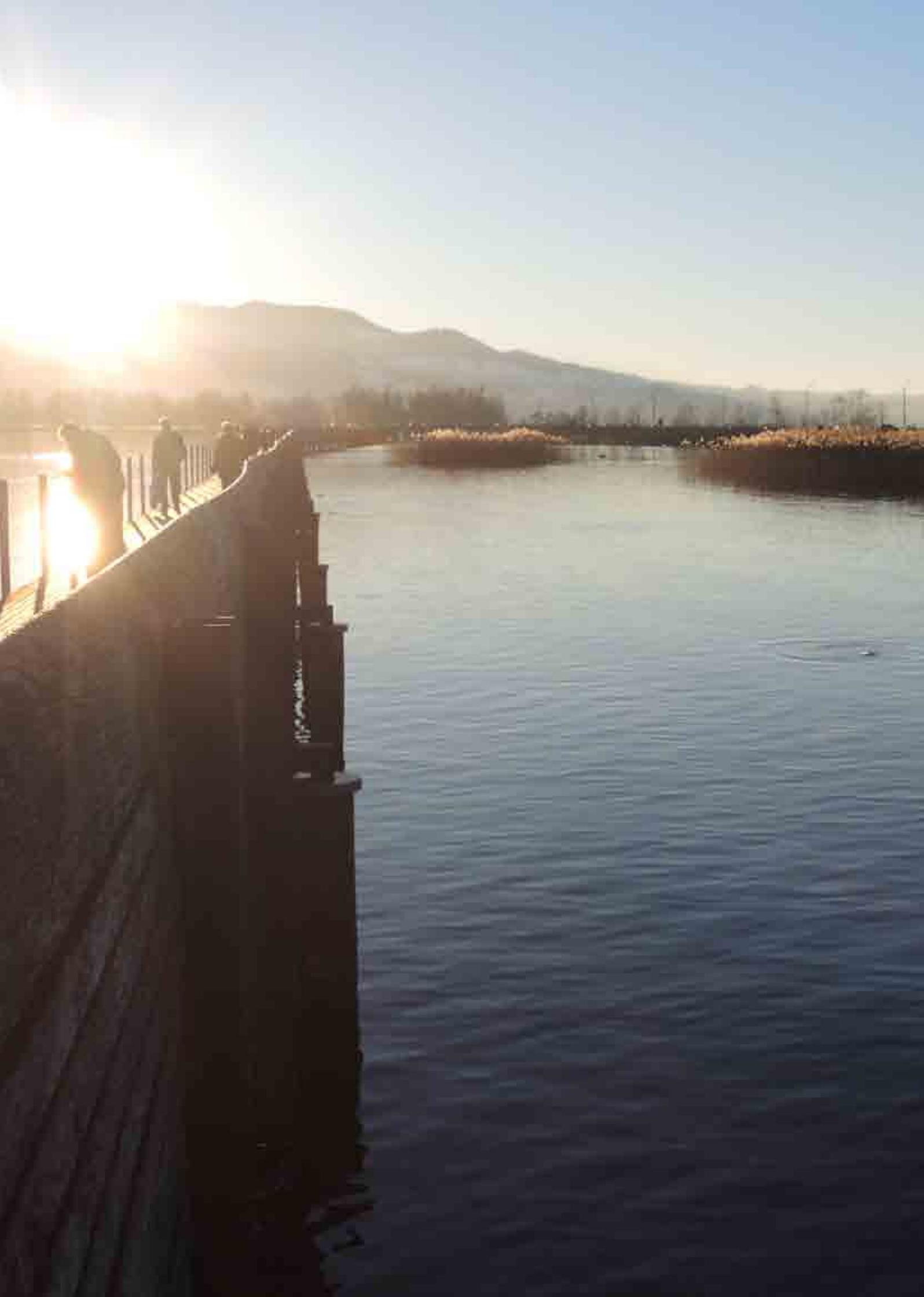
Prototype – the Nature Design Park "White Dune - Saukrasti" M 1:1000



In order to develop work tasks for the conceptual framework and the design, architecture, landscape architecture and environmental art solutions from the Latvian scheme we carried out research and spatial feasibility study (September 2015 - December 2015). Taking into account the results of the study, the procurement procedure was implemented to develop the conceptual framework and to create the environmental design objects. On the basis of the data collected from the realized Prototype - the Nature Design Park - in August 2016, the socio-economic impact of the Project outcomes will be assessed. A set of recommendations to be introduced in similar territories in other municipalities of Latvia will be elaborated.

ENVIRONMENTAL DESIGN OBJECTS BY ARTIST IVARS DRULLE





Conference Schedule

ECLAS CONFERENCE

SUNDAY, SEPTEMBER 11, 2016 - DOCTORAL COLLOQUIUM

8.30 am	Registration desk opens
9.00 - 11.00 am	Doctoral colloquium
11.00 - 11.30 am	Coffee/tea
11.30 am - 1.00 pm	Doctoral colloquium
1.00 pm - 2.00 pm	Lunch
2.00 - 4.00 pm	Doctoral colloquium parallel session 2.00 pm Executive committee meeting
4.00 - 4.30 pm	Coffee/tea
4.30 - 6.00 pm	Doctoral colloquium parallel session 4.30 pm Executive committee meeting
6.00 to 8.00 pm	Welcome reception

MONDAY, SEPTEMBER 12, 2016 - CONFERENCE DAY 1

8.00 am	Registration desk opens
9.00 - 9.30 am	Welcome by: Hermann Mettler – Principal of HSR Rapperswil Martin Klöti – President of canton St Gallen Erich Zoller – Mayor of the city of Rapperswil-Jona Simon Bell – ECLAS President, Estonia Michael Jakob – hepia Genève, OK member Peter Petschek & Dominik Siegrist – HSR Rapperswil, OK members
9.30 - 10.15 am	Keynote Chris Reed – Assoc. Prof. in Practice of Landscape Architecture, Harvard University, Cambridge, MA / USA
10.15 - 10.30 am	Coffee/tea
10.30 - 11.15 am	Dialog Keynote between Raffaella Fabiani Giannetto, Assistant Professor, University of Pennsylvania, Philadelphia, PA / USA and Paolo L. Bürgi – Landscape Architect, Studio Bürgi, Camorino / CH; adjunct professor of Landscape Architecture, University of Pennsylvania; professor, Istituto Universitario di Architettura di Venezia and Politecnico di Milano / IT
11.40 am - 2.00 pm	Visit at ENEA BAUMMUSEUM, Rapperswil-Jona (including lunch)
2.30 - 6.00 pm	Parallel sessions 1
6.05 - 7.00 pm	Poster session
4.30 - 7.00 pm	Heads of schools group meeting
7.30 pm	Heads of schools group dinner, Restaurant Rathaus, Rapperswil

TUESDAY, SEPTEMBER 13, 2016 - CONFERENCE DAY 2

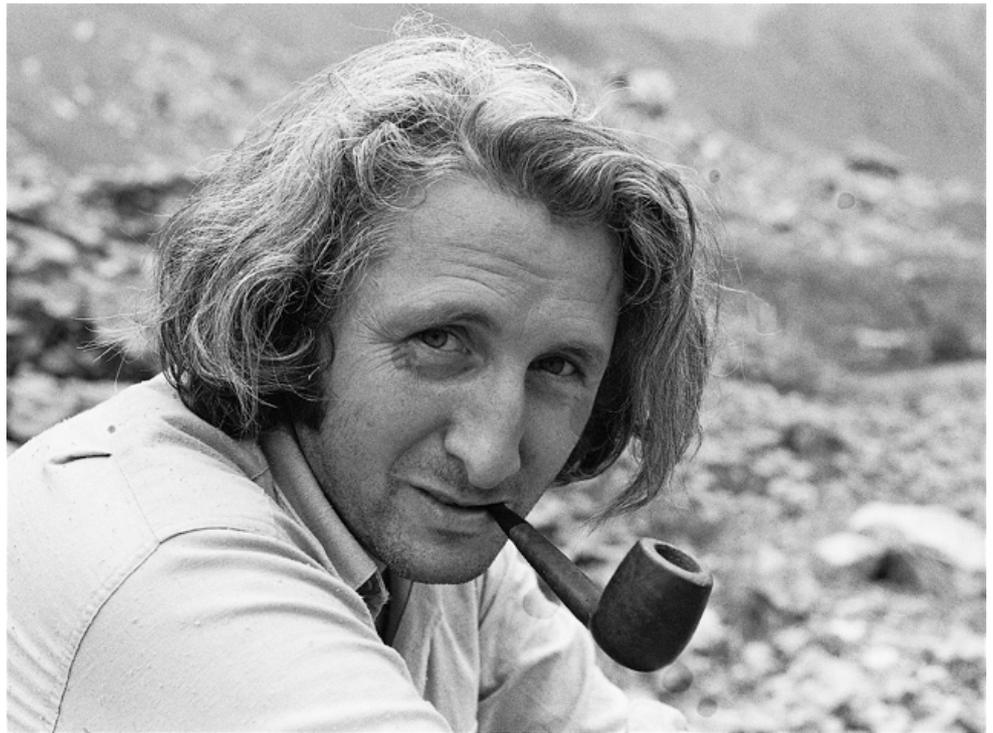
8.00 - 8.45 am	Keynote Noel Kingsbury – Freelance Garden and Planting Design / UK
8.50 - 9.35 am	Keynote Jörg Rekitke – Professor and Deputy Dean, Landscape Architecture, School of Architecture and Design, RMIT University, Melbourne / AUS
9.35 - 10.00 am	Coffee/tea <i>Book Launch: Research in Landscape Architecture with Adri van den Brink and Diedrich Bruns</i>
10.00 - 11.40 am	Parallel sessions 2
11.40 - 12.40 pm	Lunch
12.40 - 1.25 pm	Keynote Matthias Stremlow – Federal Office for the Environment FOEN, Rural Areas Section, Bern / CH
1.45 - 5.15 pm	Parallel sessions 3
5.25 - 6.25 pm	ECLAS general assembly (participation of school representatives)
6.30 - 6.50 pm	Conference closing and announcement of next conference (participation of all participants)
7.30 pm	Conference dinner and awards ceremony

WEDNESDAY, SEPTEMBER 14, 2016 - OPTIONAL EXCURSIONS

8.00 am - 4.00 pm	Parallel excursions Excursion 1: Urban Densification in Zurich – Open Spaces in the Area of Conflict Between Private and Public Interests Excursion 2: Bridging the Gap – From Centre to Periphery Excursion 3: Alpine Landscapes and Nature-Based Tourism in the UNESCO World Heritage Tectonic Arena Sardona
5.00 pm	Free evening/departure



Organizing Institutions



Prof. Dr. Dieter Kienast 1979 - 1992 Professor für Gartenarchitektur an der HSR.
A teacher who was influential for a whole generation of Swiss Landscape Architects.

HSR Hochschule für Technik Rapperswil

The Degree Programme of Landscape Architecture

The degree programme Landscape Architecture is the school of Landscape Architecture in German-speaking Switzerland. We offer a bachelor programme of three subjects: Planning and Design of Urban Open Spaces, Landscaping and Landscape Management, Landscape Development and Design. We also offer a Master of Science in Engineering (MSE) with the study programme Spatial Planning. The study objective of the masters which specializes in “Spatial Development and Landscape Architecture” is based on the demands of sustainable spatial and landscape planning and includes a holistic approach covering, planning, cultural, economic, technical and social teaching contents.

HSR is the only university of applied sciences in German-speaking Switzerland which teaches landscape architecture according to the ECLAS Amended Warsaw Document. A solid training in design but also plant knowledge, designing with plants and project implementation according to the rules of architecture is very important to us. We often hear complaints from offices that nobody from HSR is applying. However our graduates are trained very practice-oriented, and therefore are in demand and usually have job prospects before graduating. HSR also offers the degree programme of Planning as a neighbouring discipline of landscape architecture. Together these two disciplines take care of the Master Research Unit “Spatial Development and Landscape Architecture” of the MSE Master’s degree.

Switzerland is known for its design-wise sophisticated landscape architecture. The now deceased, world famous landscape architect Dieter Kienast taught from 1979 to 1992 as a professor of Landscape Architecture at HSR. In Rapperswil, Dieter Kienast educated landscape architects and influenced an entire generation of successful Swiss landscape architects.

To honor Dieter Kienast and since ECLAS is held in Switzerland for the first time, we take the opportunity to present the HSR study programme in Landscape Architecture as the Swiss Centre for training landscape architects in front of an international audience. Therefore, we have edited *HSRmade*, a book edition with portraits of selected alumni from the last 44 years. Since 1975 the first graduates left, their degree in their pockets, the “Interkantonaales Technikum Rapperswil”: 40 years of successful vocational training of landscape architects in Rapperswil. *HSRmade* is a contemporary document: 25 short portraits of landscape architects who have successfully graduated from HSR over the past 40 years, each individually representing the way and diversity of the professional world of landscape architects.

We invite you to browse *HSRmade*, as well as visit our YouTube channel “HSR Landscape Architecture” with numerous guest lectures in English.

HSR Hochschule für Technik Rapperswil

Institute for Landscape and Open Space

The Institute for Landscape and Open Space (ILF) develops innovative tools and practice-oriented solutions for the entire scope of landscape architecture - ranging from small to large scales. The ILF wants to efficiently support and design practically relevant solutions for actors from administration, economy and politics. The institute is closely linked to the department of Landscape Architecture at the HSR Hochschule für Technik Rapperswil - the University of Applied Sciences in Rapperswil.

The Institute for Open Space is divided in four divisions:

Open Space and Gardens

The ILF supports municipalities and cantons in the planning and development of open spaces within settlements. Particular importance receives settlement ecology and the link between biodiversity and design. The main task is the analysis of the different usage claims and their consideration in the implementation of projects. Another focus is the use of plants as an important design element and the use of innovative construction techniques and new materials in landscaping.

History and Theory of Landscape Architecture

The ILF examines historical and contemporary open spaces of Switzerland in their cultural, socio-political and theoretical context. Emphasis is placed on the historical analysis of selected sites, the collection and evaluation of historic gardens and the development of analytical instruments in terms of urban landscape architecture. Another field of work includes the annotated compilation of German-speaking garden theories.

Landscape Development

The institute for landscape and open space ILF devotes itself to sustainable and targeted landscape valorisation and shaping. A special focal point is changing urban and suburban landscapes. ILF elaborates concepts, methods, and practice-oriented guidelines which are used in pre-operative studies. Anyone interested can find base concepts and methods, recommendations for their application and concrete examples at the LDC forum: www.lek-forum.ch. In order to promote landscape development concepts, the ILF also gives training courses and constantly publishes the latest results of its ongoing projects.

Nature-Based Tourism & Parks

The ILF supports decision makers in the economic sector, administration and politics with practice-oriented research results at the interface of tourism, landscape development and nature conservation. One focus is on the new parks of national importance. ILF offers a methodological toolkit for the development of tourism offers and product design of nature-based tourism as well as guidance and strategies for landscape-oriented recreation.

For more information: www.ilf.hsr.ch

Haute École du Paysage, d'Ingénierie et
d'Architecture de Genève

The Degree Programme of Landscape Architecture at hepia

hepia (Geneva) offers a *Bachelor of Science* in Landscape Architecture and a *Master* in Landscape Architecture together with the Geography Department of Geneva University.

The Geneva *Bachelor of Science* in Landscape Architecture, the only one offered in the French speaking part of Switzerland, is a generalist degree. *hepia* understands the landscape architect as a professional who works in the field of landscape planning at different scales. The landscape architect is an important figure in the field of planning disciplines. Their main objective is to improve the quality of our natural and built environment. Another important element in the Geneva Bachelor Programme is its interdisciplinary character. Landscape architects have to learn to work with other specialists with whom they regularly exchange methods and information. The profession of landscape architecture is therefore complex, requiring: an excellent knowledge in all the domains of construction, life sciences and especially knowledge of ecology. This all goes hand in hand with the mastering of cultural, historical and social problems related to landscape. The core of the programme however is linked to the design classes. (« projet »).

Our Bachelor programme combines excellent plant knowledge (as many other leading places in landscape architecture *hepia* continues the tradition of a former horticultural school) with a solid training concerning construction in general. One of the principal terrains of contemporary landscape architecture being the urban environment, the Geneva programme teaches how to approach the fundamental problems of the city today viewed from a landscape standpoint. Our Bachelor is definitely practice oriented. The excellence of our programme is proven by the fact that almost all our Bachelors are immediately employed once they finished their studies.

During the last decades our Bachelor Programme has profited from the reshaping of the urban and peri-urban territory of the Greater Geneva Area. Projects developed at *hepia* had a major role in developing landscape perspectives on a regional and transnational scale. Specific research programmes, teaching activities and the professional dialogue with the most important institutions dealing with the planning in general went hand in hand. Among others, some of the main projects one can cite include, the planning of marginal zones, the redefinition in landscape architecture terms of the boundaries between urban and agricultural environments, the crisis of zoning, the role of infrastructure (linked to the new interregional metroproject CEVA) and the problem of landscape planning in mountain areas.

Grün Stadt Zürich

Grün Stadt Zürich, commonly shortened to GSZ, is the Office of Parks and Open Spaces being a service of the Civil Engineering and Waste Management Department of Swiss city of Zürich. Since October 2013, Christine Bräm is CEO of GSZ.

GSZ is responsible for creating, preserving and maintaining the city's park system, sports facilities, urban forests, cemeteries, public swimming pools and playgrounds. Ten farms, nine of which are leased out, several nature schools, the local plant nursery, the Succulent Plant Collection and the Chinagarten are also operated, as well as the Quaianlagen promenades at the Zürichsee lake shore.

The department includes five divisions: Operations, Services, Promotion of Nature, Planning/Construction and Maintenance.

Operations

The Operations Division includes the nine municipal farms which are leased out and the agricultural estate “Juchhof”. The “Juchhof” meets the requirements of the Swiss Ecological Performance Record (ökologischer Leistungsnachweis ÖLN). The city forest, which covers an area of about 3,000 acres, is managed sustainably by the “Waldrevier Uetliberg” and “Waldrevier Nord”. The municipal plant nursery, which organizes various courses and events on all aspects of ‘Green Knowledge,’ belongs to this division too, as well as the lease of roughly 6,000 garden allotments. The subdivision “Workshop and Logistics”, which includes wood working, painting and mechanical workshops, is responsible for material acquisition, the vehicle fleet and repairs.

Services

The Services Division provides commercial supporting benefits. It coordinates the economic processes, especially in Human Resources, Finances, Systems Management (Informatics and Geographic Information Systems GIS) and Legal departments. The Services Division's activities are apparent at the job market, as the results of regular user surveys that generate an impact balance sheet, on annual and financial reports and through quality management.

Promotion of Nature

The Promotion of Nature Division advocates for the preservation and conservation of valuable plant and animal habitats. Its goal is to awaken the joy of nature and to show the value of a manifold city nature to city dwellers. The four municipal gamekeepers ensure the harmonic coexistence of humans and wild animals. The nature schools provide age-appropriate experiences for the schoolchildren of Zurich. A wide range of courses and events foster the understanding of nature. Since 1931, the Succulent Plant Collection has accommodated one of the largest and most important special collections of succulent plants, including roughly 6,500 different species from more than 50 different plant families.

Planning/Construction

Open space planning, open space promotion, monuments preservation and construction projects make up the backbone of this division. It ranges from future planning and concept design of new green and open spaces to the promotion of concrete building projects to the protection and development of valuable parks within the city. In addition, this division is responsible for the construction and maintenance of parks, cemeteries, sport facilities, schools and swimming pools in urban areas that include regional public facilities.

Maintenance

There are roughly 200 employees in this division devoted to the care of parks and facilities, city trees, playgrounds, streams, cemeteries and tombs, sport facilities and fields, as well as swimming pools. This division works with the sustainability principle and advocates for the preservation of biodiversity. The green area of the city is divided into 12 districts, which are managed by Green Space Managers, who are contact people for district residents.

Index

ABBOTT, MICK	237, 443
ABDUL SHUKOR, SHUREEN FARIS	351, 355
ABU BAKAR, SHAMSUL	355
AEBERHARD, RAPHAEL	519
AMAT, NUR SYAKIRA AMIRA	351
AMBROŽOVÁ, ZUZANA	447
ANDLAR, GORAN	375
ANDREUCCI, MARIA-BEATRICE	65, 565
ARILUOMA, MARI	285
ARQUES, FRANCISCO	535
ARU, FEDERICO	69
AUF DER LAKE, MARTIN	145
BAHARUDDIN, MOHD NASIR	355
BAI, CHRISTINE	241
BARTELSE GABRIËLLE	451
BELL, SIMON	73, 347, 371
BELČÁKOVÁ, INGRID	197
BENNETT, ALMUTH	485
BERTIN, MATTIA	339
BLACKBURNE, KATE	443
BOWRING, JACKY	237, 443
BRUNS, DIEDRICH	73, 319
BUTULA, SONJA	375
CAMENZIND, RETO	245
CATE CHRIST, MELISSA	81
CATTANEO, ELISA CRISTIANA	77
CHRIST, OLE	145
COLE, KURT	297

COLWILL, SIMON.....	397, 401
CZAŁCZYŃSKA-PODOLSKA, MAGDALENA	177
DE LA O, RODRIGO.....	535
DE VRIES, JEROEN.....	565
DOUGLAS, CRAIG.....	311
DUTHWEILER, SWANTJE.....	457
EGOZ, SHELLEY	249
EISCHEID, MARK.....	85
ESCUDERO, DAVID	523
FABRIS, LUCA MARIA FRANCESCO	251
FARINHA-MARQUES, PAULO	255, 409, 461, 465
FAVARGIOTTI, SARA	259
FEKETE, ALBERT.....	93
FEKETE, ORSOLYA	97
FERNANDES, CLÁUDIA.....	255, 301, 461, 465, 501, 527
FERNÁNDEZ RAGA, SAGRARIO	263, 335
FISHER, IAN	469
FORNAL-PIENIAK, BEATA	509
FOX, ANDREW	227
GADIENT, HANSJÖRG.....	101
GAWRYSZEWSKA, BEATA J.....	489
GAŽOVÁ, DANIELA.....	267
GEORGI, JULIA.....	425
GOLOBIČ, MOJCA	273
GRAHN, PATRIK	367
GRANELLO, GUIDO	251
GRIESE, KRISTINA	485
GRÊT-REGAMEY, ADRIENNE.....	331, 383

GUILHERME, FILIPA	255, 465
GUO, QIAN	277
HEAVERS, NATHAN	473
HENNING, ANNA IMOLA	105
HIROKAZU, ABE	307
HODDINOTT, WENDY	109
HRDALO, INES	375
HUNTER, ASHLEIGH	297
ĪLE, UNA	113, 323
JØRGENSEN, KARSTEN	121
KACZYŃSKA, MAŁGORZATA	547
KALLIALA, ELINA	285
KARN, SUSANNE	241
KETTERER BONNELAME, LEA	359
KIAS, ULRICH	405
KIMIC, KINGA	543
KOUKOUVELOU, ANTONIA	125
KOYLU. PINAR	129
KRIEGER, MARK	477
KRISTIANOVA, KATARINA	531
KÜFFER, CHRISTOPH	101
KÜHN, NORBERT	481
KÜPFER, CHRISTIAN	281
LAMEIRAS, JOSÉ MIGUEL	409
LAMM, BETTINA	133
LAPAYESE, CONCHA	535
LECOULTRE, ANTHONY	245
LEE, WOODY	237

LEŠINSKÁ, EUBICA	539
LI, RAN	277
LI, XUEJING	237
LIEMBD, URSINA	241
LIU, JIJIAO	289
LÄHDE, ELISA	285
MAKSYMIUK, GABRIELA	543
MALKOC, EYLUL	293
MANYOKY, MADELEINE	331
MARKOVA, MADARA	113, 323
MARQUES, BRUNO	297
MARRAS, FRANCESCO	137
MARSHALL, CATHY	551
MARTINHO DA SILVA, ISABEL	413
MAULAN, SUHARDI	351
MEDEIROS, ANA	301
MERZ, KATHRIN	315
MISHRA, HIMANSU SEKHAR	347
MOHAMAD YATIM, SA'ARI	351
MOLL, CLAUDIA	141
MONACELLA, ROSALEA	311
MONGÉ, NATHALIE	315
MURPHY, CHARLOTTE	443
MYSZKA-STĄPÓR, IZABELA	489
MÜLLER, ALBRECHT	555
MÜLLER, CORNELIA	145, 485
MÜNDERLEIN, DANIEL	319
NEUNINGER, PAUL	493

NIJHUIS, STEFFEN	149
ŃITAVSKA, NATALIJA	113, 323
NORIKO, OTSUKA.....	307
NURLU, ENGIN.....	293
PATOILO TEXEIRA, CATARINA	501
PENKO SEIDL, NADJA	327
PEREKOVIĆ, PETRA.....	375
PISTONI, ROBERTA.....	157
PLENK, SABINE.....	493
PROMINSKI MARTIN.....	161
PURS, INDRA	165
PÉREZ RAMOS, PABLO.....	153
RECHNER DIKA, IVA	433
REHR, DOROTHEE.....	485
RIBE, ROBERT	331
ROBISCHON, MARCEL.....	563
RODRÍGUEZ FERNÁNDEZ, CARLOS.....	263, 335
ROVIRA, ROBERTO.....	421
ROYCE, JAMES A.	169, 417
RUIZ SÁNCHEZ, JAVIER.....	339
RYBAK-NIEDZIÓŁKA, KINGA	173
RZESZOTARSKA-PAŁKA, MAGDALENA	177
RÖPER, CHRISTIAN	145
SANIGA, ANDREW.....	559
SCHROTH, OLAF.....	343
SCHULTZ, HENRIK	181
SHAHANOV, VESELIN.....	185
SHARROCK, ANN.....	469

SIEGRIST, DOMINIK	359
SIEWEKE, JOERG	189
SIRIGU, CLAUDIO	193
SJÖDAHL, ELISABETH	363
SKÄRBÄCK, ERIK	367
SORDI, JEANNETTE	259
STANKOCI, IVAN	197
STAPFER, ANDRÉ	101
STERGARŠEK, STANKO	433
STEVENS, JULIE	201, 227
STORIE, JOANNA T.	371
SUNDERLAND, SAREM JAMES	205
SVENSSON, KATJA	563
SZILÁGYI, KINGA	97
TAHVONEN, OUTI	497
TAKEFUMI, KUROSE	307
TAVENIER, MARNIX	451
THIEL, VIOLA	477
TOBI, HILDE	73
TOEWS, BARB	201
TOMIĆ RELJIĆ, DORA	375
TOMOKO, MIYAGAWA	307
TREIB, MARC	215
VAN DEN BRINK, ANRI	73
VAN DEN TOORN, MARTIN	209, 505
VAN ETTEGER, RUDI	89
VISSILIA, ANNA-MARIA	425
VUGULE, KRISTĪNE	113, 323

WACHTENDORE, PATTI	201
WAGENFELD, AMY	201
WATERMAN, TIM	219
WILCZYŃSKA, ANNA	223
WINGE, LAURA	379
WINTERBOTTOM, DANIEL	227, 429, 433
WISSEN HAYEK, ULRIKE	331, 383
XIU, NA	387
YILMAZ, OGUZ	129
ZARAŚ-JANUSZKIEWICZ, EWA	509
ŻARSKA, BARBARA	509
ZIELIŃSKA, EWA	223
ZIEMEŁNIECE, AIJA	113
ZIGMUNDE, DAIGA	113, 323

BRIDGING
THE GAP



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Haute école du paysage, d'ingénierie
et d'architecture de Genève

