ISOCARP
Knowledge for better Cities

From splinters to Parks

TOWARDS A METROPOLITAN DESIGN

2nd [Urban + Landscape] design: an international metropolitan design workshop

7- 10 May 2013 | Faculty of Architecture at the U Lisbon

ORGANIZATION

The workshop was held at the Faculty of Architecture-University of Lisbon, with the endorsement of the ISOCARP and under the recently created initiative "Bridging Theory and Practice"

The report and the exhibition were organized by S. Morgado, I. Moreira, J. R. Santos, J. Vargas, with contents by the Local organizing team, the Correspondent Team, Guests and Experts, and Participants:

Local organizing team

Sofia Morgado (FAUL) ● João Rafael Santos (FAUL) ● Inês Moreira (FAUL) ● José Vargas (FAUL) ● with the generous participation of Professor Pedro George (FAUL)

Correspondent team

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Guests and Experts

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Alexandra Anton (FAUL-Erasmus) ● Ana Miranda (FAUL) ● André Ferreira (FAUL) ● Carlota Oliveira (FAUL) ● Diogo Silvestre (FAUL) ● Duygu Yarimbas (FAUL-Erasmus) ● Eduardo Campelo (FAUL) ● Ewa Pietrzak (GUT) ● Francisco Marques (FAUL) ● Francisco Campos (FAUL) ● Gonçalo de Carvalho (FAUL) ● Hugo Guiomar (ISAUL) ● Inês Carvalho (FAUL) ● Inês Moreira (FAUL-PhD candidate) ● Joana Couto (FAUL) ● Joanna Rayss (GUT-PhD candidate) ● João Santos (FAUL) ● Joaquim Quintela (FAUL) ● José Vargas (FAUTL-PhD candidate) ● Kacper Skawińsk (GUT) ● Karin Benali (FAUL) ● Licínia Maria Sá Freitas (FAUL) ● Luís Adão (FAUL-PhD candidate) ● Luís Miguel Jerónimo (ISAUL) ● Mafalda Matos (FAUL) ● Magdalena Derdziszewsk (GUT) ● Manuel Vicente (FAUL) ● Matilde Amaral (FAUL) ● Monika Trojanowska (GUT-PhD candidate) ● Ricardo José (FAUL) ● Rui Felício (FAUL) ● Yo Irie FAUL (FAUL-AUSMIP)

Partners and Sponsors

Department of Urban Design and Planning at the School of Architecture, Gdansk University of Technology ● Área de Arquitectura Paisagista, Instituto Superior de Agronomia, Universidade de Lisboa ● Departamento de Ciências Sociais, Políticas e do Território, Universidade de Aveiro ● CIAUD- Centro de Investigação em Arquitectura, Urbanismo e Design ● Câmara Municipal de Lisboa ● Direcção-Geral do Território ● Fundação das Casas de Fronteira e Alorna ● EPAL ● ISOCARP

Special acknowledgement

To the ISOCARP and the programme "Bridging Theory and Practise";
To the Faculty of Architecture-University of Lisbon and to CIAUD

Schedule

		7 May	8 May	9 May	10 May
09.00	11.00	Registration and Welcoming	Design and Research Studios	Design and Research Studios	Design and Research Studios
11.00	12.30	Lectures	Lectures	Lectures	Design and Research Studios
		Paulo Pais (CML)	F. Castro Rego (ISAUTL)	Aleksandra Sas-Bojarska, Magdalena Rembeza(GTU)	
		Pedro George (FAUTL)	Cristina Ferreira (CML)	Joanna Rayss (GTU)	
		Sofia Morgado/J.R. Santos (FAUTL)		Monika Trojanowska (GTU)	
				Paulo Silva (UA)	
Lunch					
14.00	17.00	Field trip (bus)	Design and Research Studios	Design and Research Studios	Closing Conference
					Cristina Cavaco (FAUTL/DGT)
		Palácio Fronteira 'Águas Livres' Aqueduct			Piotr Lorens (GTU/ISOCARP)
17.00	18.30		Intermediate presentation/discussion	Design and Research Studios	Final presentation/discussion
19.00		Dinner			

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OPPORTUNITY AND AIMS

This event strengthens an already steady relationship between FA-UL and FA-GUT in the field of academic and scientific cooperation and networking.

Previous programmes included two workshops (bringing together tutors and students from both institutions and partners) in Gdansk and Lisbon, respectively.

Staff from both universities has been actively participating in reciprocally organized conferences and seminars, several Erasmus teaching missions and joint calls for bilateral and European funded research projects.

Following a very successful first experience in 2011, with the International Workshop *Towards Eco-city. Gdansk sea shore area development* organized by GUT, a second one would find correspondence in Lisbon with *Limits and Interface*, organised by FA-UL in 2012.

The 2013 programme, *from splinters to Parks,* is now looking towards a different set of issues, urban and landscape design related, in the direction of an overall metropolitan design exploration in Lisbon. A forth workshop is already expected to happen, next May 2014, in Gdansk.

As such, the current workshop stood as an opportunity for the increase of cooperation between European countries and institutions, especially in common areas of interest such as urban planning and development in environmentally sensitive areas.

Finally, the team would like to express a special acknowledgment to the ISOCARP, for endorsing the event and treasured assistance in disseminating the results. And especially to the new YPP programme "Bridging Theory and Practise".

By Professor José Pinto Duarte, President of the Faculty of Architecture, University of Lisbon

The Faculty of Architecture (FA), or simply *the School* as people are used to call it for its roots dating back to the 16th century, offers Bachelor, Masters, and PhD Programmes in the fields of Architecture, Urbanism and Design. It also offers post-graduation programmes, not leading to a degree but providing additional training to professionals on a *lifelong learning* basis.

This wide range of offers makes the FA the largest and most diverse school in the country in these fields, with about 3000 students. It is also the school with the largest number of foreign students not only from Europe but also from overseas, under the scope of several exchange agreements.

Architectural and Urban Design is the strongest asset of the Bachelor and Master programmes, where knowledge is built by designing. The programmes are open enough to provide education to a wider range of professionals, such as consultants, researchers and public boards in fields related to the built environment, culture and the industry. This diversity of profiles is probably one of the reasons why we can boast that over 95% of our graduates get a job within one year after graduating.

Currently, FA is determined to train professionals capable of working with the Portuguese society contributing to increase the national potential for innovation, competitiveness and exportation. For this reason, we support the development of design projects and scientific theses in collaboration with public and private entities, fostering entrepreneurship and creating future opportunities for students.

The Doctoral programmes are focused on the development of advanced research in Architecture, Urbanism and Design. This is supported by CIAUD, our Research Centre rated Excellent by the National Foundation for Science and Technology. Newly created offices that support technology transfer and provide

specialized consulting services contribute already to a growing steadiness of networks with other universities and stakeholders.

As an up-to-date school, were tradition and innovation are combined, it constitutes a reference institution in the training of architects, planners and designers, as well as in the production of socially acknowledged, specialized and interdisciplinary research.

By Professor Pedro George, Director of the Project Department, at the Faculty of Architecture, University of Lisbon

The Faculty of Architecture of the newly formed Lisbon University (resulting from the fusion of two prestigious universities of the city) has as its main objective the education of architects, be they more inclined towards buildings proper, urban planning or interior design. Education is here used in its broadest and most humanistic meaning covering technical, artistic and human aspects.

In so doing, the main formative vehicle is project work; ancillary disciplines are meant to contribute not only to the specific needs of the project themes but also to reinforce the students' general knowledge and critical capacity.

It is in this context that the occurrence of local, or, even better, international workshops has a crucial role to play by providing the opportunity to compare diverse and differing points of view and ways of approaching a problem, diverse and differing methods of work towards solving it, all this to be exchanged and shared by the participants.

"From Splinters to Parks" was one of these events; it happened in the wake of a few others of the same kind, organized by the same team, already creating a (small) tradition in this field, which is highly welcomed by the Faculty and the Project Department.

In the Project Department we are very clear about the crucial role that this type of event can have in the education of the architect, exactly because it complements project work and broadens the life experience of our own students and teachers, as well as that of our guests (we hope!).

The information that follows gives a (pale) image of the real happening, in terms of its intensity and process development. We can see some of the results but, unfortunately, results are not the main concern in a workshop of this kind. Human interaction and exchange of ideas and methods are much more important, but also much more difficult to document.

Nevertheless, we have the greatest of pleasures in sharing what is possible to share with you about the workshop, and extend an open invitation to our next one.

THE THEME

The role of open space is currently acknowledged as a key topic for urban and metropolitan development, especially in areas undergoing economical change and transition from 20th century growth trends. On one hand, open space is a spatial system that frames the morphology and structure of metropolitan fabrics. These attributes are particularly visible in the context of Europe's metropolitan regions, in which open space has produced highly diversified and culturally embedded territorial patterns, whether they be shaped by land and water features, plots of agricultural land, or in-between splinters of the urban mosaic.

The contributions of Bernardo Secchi (1993) and Paola Viganò (1999, 2010) (*città elementare*, *città porosa*), Francesco Indovina's (1990) *ciità diffusa*, Antoni Font's (1997) *metropole descontínua*) or Thomas Sieverts's (1997) *zwischenstad* have highlighted the reciprocity of open spaces and built fabrics as a ground for understanding metropolitan development and its specific morphology in the late 20th century. These contributions have allowed a deeper understanding of the materials, processes and patterns that shape metropolitan territories from the view point of an urbanized landscape.

Adding to its role as support for ecological and bio-physical balance and continuity, current research has approached open space not only as a culturally embedded feature of cities and of urban planning (Llop, 2009), but also the support for a much needed productive landscape (Giseke, 2008).

As such, open space can become a key element of *program* for a metropolitan urbanism (Tatom, 2009): an actively designed spatial system, devised in the frame of landscape urbanism (Waldheim, 2006), along infrastructural and land use planning.

Its multi-scalar and multi-functional potential can be engaged in dealing with both large scale approached to metropolitan networks (i.e. ecological and

infrastructural networks) and local scale interventions aimed at improving the spatial quality and livelihood of communities.

New issues and challenges arise in the context of new paradigms of urban development. Scarcity and shrinkage in post-industrial contexts, extensive and rapid growth in emerging world economies, along with changing demands facing energy, food production and mobility and ICT networking, claim a renewed research and design agenda for urban planning in which open space and landscape are sensed as pivotal.

Current topics will be explored at the theory and best practises levels, and *in situ*, with a real approach in Lisbon. Known as the city of seven hills, Lisbon's unique urban character comes from the way how the city's shaped open spaces – plazas, streets, walled sites – bear the interplay of the river Tagus with the exuberant topography around downtown and the valleys to the north.

Framing a historical limit of Lisbon to the west, Monsanto Hill has always been embedded in the city imaginary. As part of a sophisticated approach to Lisbon's urban and regional planning, it was covered with pines, becoming an urban forest park and a key element of Lisbon's municipal and metropolitan ecological structure.

The workshop addresses the role of the forest park of Monsanto in the context of the city and metropolis of Lisbon. It challenges its participants to discover its landscape and cultural heritage, its diversified activities and its role as a vital open space as the *motto* to bring innovative ideas regarding its future Participants are challenged to imagine new scenarios regarding:

— A global strategy, taking into account the role of Monsanto as a metropolitan park surrounded by intensively built areas;

— The potential of complex systems of open space and infrastructure as the frame for a designed proposal;

— The shaping of large scale landscape features and its interface with metropolitan fabrics and public space.

- *The park as part of the city and metropolitan open space structure*

The challenge is to acknowledge and intensify its role as a large scale green space with important environmental and landscape attributes. This perspective requires a vision beyond the park's edges, crossing the city boundaries and looking forward to the potential of metropolitan landscape.

- *The improvement of public space and mobility connections to the city*

Despite being the site for a diversified range of leisure, sport, educational and other public facilities, Monsanto lacks a coherent public space system and faces spatial disruption by heavy infrastructure along its edges. Strategies to improve urban mobility and functional synergies are required to address this topic.

- *Working with the architectural and landscape heritage*

As a man-made forest park, Monsanto is not only an outstanding landscape feature of Lisbon, but also the outcome of centuries-old place making through agriculture and forestry, water works and fortifications, architecture and urban planning. The challenge now is to claiming this as a contemporary and meaningful heritage for the future of Monsanto. The programme included a field trip (visit to Águas Livres Aqueduct and Fronteira's Gardens and Palace) and introductory lectures by experts.

Lectures

Designing the landscape, Paulo Pais (CML) ● Monsanto Park – evolution and management, Francisco Castro Rego, Teresa Grilo (ISAUL) ● Monsanto Forest Park, Cristina Ferreira (CML) ● Department of Urban Design and Planning at the School of Architecture, Gdansk University of Technology, A. Sas-Bojarska, Magdalena Rembeza (GUT) ● Choices of plants in Landscape Architecture, especially in relation to historical sources, Joanna Rayss (GTU) ● Therapeutic qualities of nature and public parks design, Monika Trojanowska (GTU) ● Lisbon metropolitan area: emergent dynamics and empty spaces, Paulo Silva (UA) ● Fields of design: landscaping the city, Sofia Morgado, João Rafael Santos (FAUL)

Closing conference

From extensive urbanisation to a compact city policy. Challenges in a time of change, Cristina Cavaco (FAUL/DGT) ● From modern to post-modern metropolitan development pattern – lessons from Singapore and Australia, Piotr Lorens (GTU/Vice President YPP ISOCARP)

Contribution to curricular units in Master level Programmes

The Workshop was an opportunity to bridge the scientific and institutional interests with pedagogical aims of on-going curricular units in Master level Programmes. 19 students of the 4th year of the Master Programme in Architecture with Specialization in Urbanism of FAUL were already involved in the development of a designed territorial and public space approach to the area of study, under the supervision of the organizing team's professors. The Workshop's theme and topic were seen as a contribution to the course aims thus reinforcing the student's speculative and critical approach.

Students from the Master in Architecture with expertise in Urbanism (FA, ULisbon), Master in Architecture (GUT), Master in Landscape Architecture (ISA, ULisbon) were also involved in the Workshop's design groups, contributing to their training and, in some cases, to the development of Final Master Projects and Dissertations.

PhD candidates from FAUL and GUT, in the field of Urban Planning and Design, participated with lectures and discussion bridging their individual research topics within the workshop theme.

The lectures and the final Conference were open to the public, contributing to a broader dissemination of the state-of-the-art.

ECTS Crediting

Participation in the Workshop was credited by FA Scientific Board with 1,5 ECTS for works developed in the design studios leading to the presentation of posters, and 2,0 ECTS for participants presenting research papers.

Website

Workshop's dissemination included the development of an internet website, the use of institutional, academic and scientific mailing lists and printed media (posters, flyers). The event is linked to the *Metropolis* website –

http://metropolis.fa.utl.pt/metropolis.htm, where previous and on-going initiatives by the organization team are presented, and in permanent updating.

Exhibition

The Workshop's results are to be presented in an exhibition at the International ISOCARP Conference in Brisbane, Australia. The exhibition includes the work developed by the student participants regarding their design proposals for the Lisbon/Monsanto study area, as well as research contributions by the Workshop's lecturers and PhD candidates and institutional presentations by organization partners.

The exhibition will also be presented at the *Smart Metropolis Congress*, in Gdansk, Poland, in November 2013, and in Lisbon later on.

CHALLENGES AND ISSUES: DESIGN!

THE PHD CANDIDATES' DEBATE

PhD Candidates had a two tier role in the workshop. On one hand they formed part of the tutors' group, actively assisting the groups in the development of the urban and landscape design proposals; on the other their own research was the motto for the exchange of experiences of topics and methodologies, as well as a challenge to advance in their own research questions and empirical work. The abstracts that follow were developed and are being considered for an extended version of the report, together with other contributions by the group of lecturers.
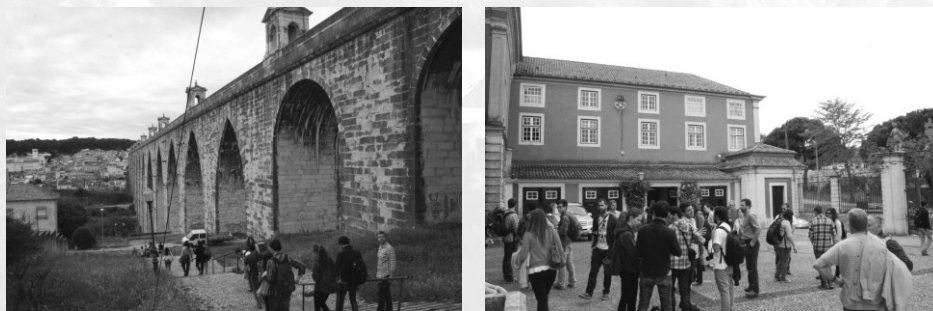
LISBOA-CASCAIS BUSINESS AXIS: MONSANTO AND A5 HIGHWAY AS THE MILESTONES FOR THE WESTERN DEVELOPMENT OF METROPOLITAN LISBON

Inês Moreira
CIAUD / Murbs – metropolitan studies and forms of urbanization research group
FAUTL (Faculdade de Arquitectura da Universidade Técnica de Lisboa) and DUOT-ETSAB (Departamento d'Urbanisme i Ordenació del Territori de Escola Tècnica Superior d'Arquitectura de Barcelona, Universitat Politècnica da Catalunya)

The paper presents a set of preliminary findings of the on-going PhD research in Urbanism, addressing the agglomerations of production, distribution and consumption in metropolitan Lisbon, with a morphological approach to their fabrics and processes of formation, transformation and adaptation in the context of change. The main objective is to approach the emergence of the Lisbon-Cascais business axis, formed by functionally specialized areas related to knowledge production activities, by revealing its formation/consolidation processes, discussing its role in the overall metropolitan structure and their relation with the infrastructures (mobility and open spaces).The formation of the business axis Lisbon-Cascais is related to the construction of the A5 highway and the shortening of the travelling distances to the center. The process started in the 1930s with the project of Monsanto park and the A5 highway from Lisbon to Estádio Nacional, present in 1938-48 Lisbon's Masterplan, from de Gröer. The park and the highway have played a central role in the Lisbon's metropolitan development, pointing out the western growth direction based on the road circulation (the A5 highway and the Marginal road), complementary to the nineteen century railroad. The morphological changes in Lisbon's territory reveal local features associated with specific conditions, which require a multi-layer analysis to the recent formations and to their relationship with the supporting urban structure. The research methodology combines a theoretical with an empirical approach, based on field work and morphogenetic analysis resorting to the overlay of cartography. In order to contextualise and identify the processes underlying the process of formation of these areas, the article explores the transformations that have occurred in the metropolitan structure over the past 50 years and identifies the main drivers and consequences of the territorial specialization, focusing the Lisbon-Cascais axis.

(Important notice: this is a working paper resulting from a research under development. Its extended final version will soon be publish integrated in the report from the group Murbs)

1. Metropolitan filaments

The following paper presents an approach to the urban fabrics and its morphogenesis by highlighting an emerging urban morphology, arising from processes of concentration of economic agglomerations specialized in the production, distribution and consumption in Lisbon's metropolitan territory1.

The changes in the physical, economic and political context of the last twenty years have boosted the transformations in the metropolitan structure and the constitution of functionally specialized urban formations, which specific morphologies directly related to the mobility network (metropolitan filaments). These are product of the metropolitan infrastructuring and densification, resulting in a system of areas of high concentration of economic activities related to the tertiary (and quaternary2) sector and, in parallel, the abandonment and restructuration of large peripheral industrial areas.

The main objective of the research is the identification of these specialized areas and their morphologies, revealing its (trans)formation processes and determinants factors that shaped them, discussing their role in the metropolitan structure and how they can adapt and relate to their surroundings, in the current context. Although integrated in a comprehensive approach to the metropolitan territory, this analysis focuses on a case study area – the axis between Lisbon and Cascais, deeply related to the construction of the A5 highway and the shortening of the travelling distances to the centre. The process

[1]   Lisbon's metropolitan territory is understood as the administrative boundary of the Lisbon Metropolitan Area (Law 46/2008, August 27th) with its 18 municipalities and Benavente, as it is the territory in which the metropolitan structure has more impact on the occurrence of the changes in land use occupation, through an analysis independent of the administrative boundaries. In MORGADO, S. 2005. Protagonismo de la ausencia: interpretácion urbanística de la formación metropolitana de Lisboa desde lo desocupado. PhD thesis, Escuela Técnica Superior de Arquitectura de Barcelona, Universidad Politecnica de Catalunya.

[2]   Quaternary sector (or higher tertiary sector) of the economy corresponds to an expansion of the three traditional economic sectors, which classifies the activities related to intellectual services, specifically, to the production and dissemination of knowledge: culture, education, information technology, research and development.

started in the 1930s with the project of Monsanto Park and the A5 highway from Lisbon to Estádio Nacional, present in 1938-48 Lisbon's Masterplan. In this sense, the park and the highway have played a central role in the Lisbon's metropolitan development, pointing out the western growth direction based on the road circulation (the A5 highway and the Marginal road), complementary to the nineteen century railroad.
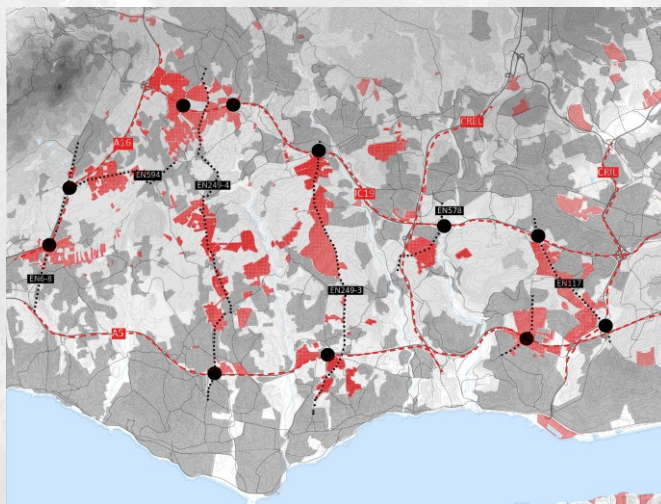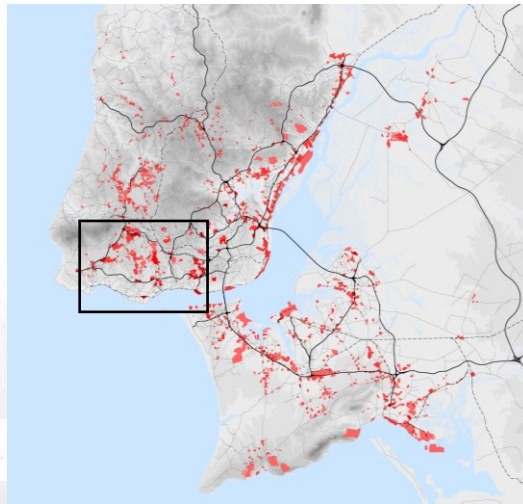

Fig.1-2: Spaces occupied by economic activities (related to the secondary, tertiary and quaternary sectors) in Lisbon's metropolitan territory and zoom in the case study area between Lisbon and Cascais. Source: 2012, own elaboration based on military charts M888 series, frames 416,417,430 and 431, scale 1:25 000 (dates 2008-2009) and aerial photography.

The consolidation of the road and rail network, the motorization of the population and the resulting changes in the way of inhabiting the city are present in the extension of the physical boundaries of metropolitan Lisbon, the

colonization of the mobility infrastructure (DOMINGUES, 2011) and the consequent emergence of functionally specialized urban formations, supported by the blurring of traveling distances and the high degree of metropolitan connectivity (GRAHAM and MARVIN, 2001). The metropolitan mobility network that consisted initially in a combination of harbour, railway and national roads was gradually complemented by an articulated system of highways that connect and structure the territory local and nationally. Hence, the network acts as catalyst for the urban polarization, characterized by the occupation of peripheral areas in strategic locations, concerning accessibility, visibility and connectivity. These contemporary metropolitan morphologies (FONT, 2007) are structured by the mobility axis, which induce linear occupations along the roads that communicate with the highway exits, with programs related to high-tech industry, logistics, retail, offices or R&D. In this way, the metropolitan filaments are morphologically characterized by filamentary structures, developed as strings along the road infrastructure, segregated from their immediate surroundings through physical, formal or language barriers.

The metropolitan filaments are the result of processes of great dynamism that, according to their nature and location, had their origins related the industrial fabrics established until the 70s, followed by the exponential growth of the tertiary sector during the 90s and the current presence and strengthening of the quaternary sector. The adaptation to the new demands of the knowledge society, along with the turn from an industrial to a services economy3, was materialized in metropolitan Lisbon with the atomization and fragmentation of small/medium scale industrial and logistical activities through the territory, as well as the emergence of dense knowledge-intensive production or commercial clusters.

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[3] In 2010, the tertiary sector was responsible for 60% of the employment in Lisbon's region, according to CARVALHO, A. C. (ed.) 2010. *Anuário Estatístico da Região Lisboa 2010,* Lisboa: INE. P.125.

The research methodology is based on a theoretical approach combined with the empiric contact with the territorial reality, through fieldwork, cartographic/documentary interpretation and morphogenetic analysis of the urban formations and their correlation with the metropolitan area. The changes in the metropolitan morphology reveal local characteristics associated with specific geographic, historical, social and economic circumstances, and in this sense, require an analysis of the various layers that form the metropolitan filaments and their relation to the urban development.

2. The formation of Lisbon-Cascais business axis

The formation of Lisbon's metropolitan filaments reveals a disposition related to the development of the mobility infrastructure, as well as the growth of urban areas, the availability of unoccupied spaces and the urban and planning policies. In metropolitan terms, the area between Lisbon and Cascais represents a very dynamic urban axis, a metropolitan filament, connected to knowledge intensive activities, formalized in a dense cluster of urban structures built specifically for this use, uncovering a municipal competitiveness strategy, as well as a synergic development in the surroundings of the first Science and Technology Park in Portugal, which combines business and academic activities – the Science and Technology park Tagus Park. However, besides this type of program, this axis presents examples of dense concentrations of light-industrial and logistic activities in strategic areas, with specific morphologies that gradually integrated commercial and leisure activities with a metropolitan range.

The western territory of Lisbon is characterized by one of the highest population densities in the region, representing one of the traditional urban expansion axes, since the nineteenth century, boosted by the railway lines from

Cascais and Sintra4. Prior to the completion of the A55 highway to Cascais and the construction of the freeway IC196 to Sintra, the territory was structured by the railways and by a network of roads that followed the most favourable topographic lines linking the various villages, and in the vicinity of which emerged the first spaces occupied by economic activities, suggesting a close relationship and dependence with the biophysical support, with the road network and with the urban settlements.

Until the second half of the twentieth century, the urban growth of this area was concentrated along the coast, converging on the surroundings of the railway stations of the Cascais' and Sintra's lines (SALGUEIRO, 2001). To the north of Cascais' railway line, the territory was mainly rural with a large number farms that represented opportunity areas and were rapidly urbanized from the 60s onwards, mainly for a residential use. On the other hand, it was during the years before the construction of the highways A5 and IC19 that the first industrial units identified the locations where later emerged the logistic clusters, related to the production and distribution of goods. Their location combined the conditions of the biophysical layer, proximity to the urban centres and accessibility conditions, structured by the railway and the system of national roads, which traced the old paths through the countryside, oriented towards the entrance of Lisbon through its city gates.

The mobility network suffered few alterations in relation to the one existing in the beginning of the century, since the roads of the nineteenth century were maintained, with upgrades in materials and in the transversal

[4]   The railway lines that serve this area are the Cascais line and the Sintra line, operating since 1889 and 1887, respectively.

[5]   The construction of the A5 highway, linking Lisbon to Cascais, was started in 1944 (with the section between Lisbon and the National Stadium, in Jamor) and completed in 1991 with the connection to Cascais.

[6]   The complementary itinerary (freeway) IC19, linking Lisbon to Sintra, was completed in 1994, subsequently suffering successive works of improvement and enlargement.

profiles (GEORGE and MORGADO, 2007). In this sense, the close relation between the location of the industrial activities and the mobility network is present in the large industrial complexes, nowadays abandoned – the Oeiras' Foundry (Fundição de Oeiras)7 that combined the proximity to the urban centre of Oeiras with the direct connection to the Cascais' railway line and the proximity to the marginal road EN6; or factory complex Sorefame8, in Venda Nova, which took advantage of privileged rail access (through a private extension of the Sintra's railway line) and road (through the connection between Portas de Benfica and Amadora).

The definitive link between the western area and Lisbon was materialized in the 40s, with the project of Monsanto Park and the construction of the highway A5 that together with 2ªCircular allowed for an effective connection between the National Stadium, in Jamor, and the Airport, in Portela. The afforestation of Monsanto was part of a set of public works promoted by Estado Novo, in the context of an intense activity of infrastructuring of the city, driven by Duarte Pacheco. The discussion around the afforestation and creation of Monsanto Park dates back to 1868 with the report on the country's overall greening of Carlos Ribeiro and Nery Delgado based on hygienist references imported from various European cities and the need of firewood supply. But despite the beginning of the works in 1929, the Forest Park of the City (Parque Florestal da Cidade) was only created in 1936, occupying a treeless hill, which previously supported agricultural and pastoral activities. The creation of the park resulted from expropriation processes of approximately 1000ha, and represented a major innovation in the design of collective green spaces. The

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[7] The Oeiras' Foundry, *Fundição de Oeiras* (metal industry) was in operation between 1929 and 1980.

[8] The *Sorefame* (metal and transport equipment industry) was in operation between 1943 and 2004.

park, designed by Keil does Amaral, integrated spaces for sport, recreation and education uses.

The 40s were characterized by a strong infrastructural boost in Lisbon and its surrounding areas, supported by the Lisbon's Masterplan 1938-1948, in charge of de Gröer. The plan reflected the ideals of the garden city, by articulating the city with a set of interconnected ring roads that connected the existing radials, involved by a green belt that established the transition between the city and the rural outskirts of Lisbon. The expansion of the city westwards in the direction of Cascais was represented by a number of elements – the Cascais' A5 highway, the National Stadium and the Monsanto Park, integrated in the green area with a connection to the Peripheral Park, with the airport area and the Oriental Park. Thus, Monsanto was established as a key player in the infrastructure of the city, introducing a comprehensive view of the metropolitan expansion, which together with the Marginal road and the A5 highway, complemented the rail circulation and supported the impulse of the peripheral growth and the consolidation of the Lisbon-Cascais axis.
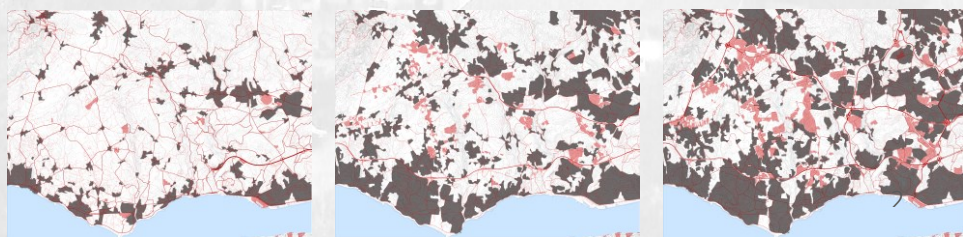

Fig.10-13: Relationship between the spaces occupied by economic activities and other urbanized areas in the area between Lisbon and Cascais. Source: 2012, own elaboration based on military charts M888 series, frames 416,417,430 and 431, scale 1:25 000 (dates 1962- 1971, 1992-1993, 2008-2009).

The completion of the A5 and IC19, in the 90's, created an area with great potential for the concentration of economic activities along the roads that communicated with their exits, establishing the connection between these two highways. Starting from the intensification of locations identified by the previous industrial fabric that acted as a development engine, the area witnessed the

emergence of new concentrations deriving from the creation of the articulated road system that integrated the network of highways and the national roads.

The mobility network which supports the functioning of this metropolitan axis consists of a system of roads9 that articulate the two high speed circulation lines (A5 and IC19), establishing their accesses and allowing the transition between them. Thus, these roads represent an important structuring element of the territory, by allowing the access to the metropolitan network, but also the accessibility and local distribution. In the last 20 years, the establishment of the high-speed mobility network was associated to the growth and development of metropolitan Lisbon, consolidating the extension of the peripheral urban areas, as well as their gradual independence from the centre. The metropolitan circulation system integrated and complemented the existing infrastructures (the Sintra and Cascais railway lines, the A5 highway and the IC19 expressway) with the circular highways of Lisbon (the external ring CREL and the internal ring CRIL) and with the A16 highway connecting Cascais to Sintra. The slow local distribution is established by the national roads network that was defined (with a few exceptions and adjustments) previously to the construction of the highways, replicating the paths that structured the territory occupied by farms, until the 50s.

This transformations led to an area of great connectivity and conducive to the installation of tertiary activities, formalized in a juxtaposition growth along the national roads, which functioned as transversal axis for local accessibility and with connections to the high-speed metropolitan network. Taking advantage of the increased connectivity, the growth of the existing industrial areas was materialized by the increase and addition of new units related to the activities of processing, distribution and retail. This intensification gave rise to compact

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9 This circulation system is structured by the roads (*Estradas Nacionais*) EN6-8, EN594, EN294-4, EN294-3, EN578, EN117, the highway A5 and the freeway IC19 (the circular highways of Lisbon CREL and CRIL, also contribute to this system, at a metropolitan level).

clusters unitarily developed (eg: the case of the compact cluster of Queluz de Baixo, Agualva or Abóbada), or to the filamentary formations gradually consolidated along the roads (eg: the case of EN249-2 between Abóbada e Ranholas, or the EN117, between Portela and Alfragide). Simultaneously, new clusters emerged from the concentration of medium-sized commercial and storage units, associated to the nodes of the highways and accessible from the national roads (as in the case of Outorela, Mem-Martins, Alcoitão and Manique de Cima).

As the metropolitan Lisbon's highway network was formalized, simultaneously emerged the quaternary sector and the construction of spaces for specialized uses related to intensive knowledge activities, in peripheral areas to Lisbon. The location strategy for these spaces is characterized by the identification of high connectivity areas, supported by the connection to the highways that contributes to the polarization associated with their nodes and subsequent development along the roads that serve them. This transformation assumed a significant presence in Lisbon's metropolitan territory, during the last 20 years, with the concentration of activities related to the high-technology industry and R&D activities located at strategic points, creating an attraction of complementary activities.

The clear spatial and meaning border between the areas of concentration of economic activities (metropolitan filaments) and the residential fabrics is present in their morphological characteristics (that were inherited by the earlier occupation and land division forms, combined with the functional response, scale difference and physical segregation). The urban growth dynamics contributed to the change of the proximity relation between the specialized areas and their and built environment, by the partial occupation of the transition buffers between the two programs, but without establishing a dialogue or creating multifunctional mixed spaces. The reduction of these areas led to the emergence of more inventive segregation mechanisms – by adapting the local roads into freeways with separation of the pedestrians and higher speed of

circulation, or by creating walls and spaces clearly separated from the neighbourhood represented by the park typology10 (MANGIN, 2004).

Fig.14-16: Logistic park Talaíde Park, business park Quinta da Fonte and commercial area Oeiras Park. Source: 2012, Bingmaps.com2012.

Fig.17-19: Relation between business parks and mobility network: Quinta da Fonte (Laveiras), Arquiparque (Linda-a-Velha) and Lagoas Park (Leião). Source: 2012, own elaboration.

Since the beginning of the 90s, the concentration of corporate headquarters and technology parks has been acquiring a strong present in the Lisbon-Cascais axis. These consist in a group of unitary construction parks, with common facilities, managed by a single promoter, usually attracting similar units, sharing the generated business dynamics. In order to allow for greater efficiency, the business parks concentrate in the same space services and common equipment and take advantage of the complementary programs in their vicinity – such as hotels, commercial spaces, sport facilities, recreation areas and housing

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[10] *With programmatic variations, the park typology is applied to logistics and industrial functions (logistics and industrial parks as Penedo Park or Talaíde Park), business functions (technology and business parks as Tagus Park, Quinta da Fonte or Arquiparque) or commercial functions (commercial areas and shopping centres as Sintra Retail Park or Oeiras Park).*

designed for their business-standards. The most significant example of this process is in Porto Salvo, the location of Tagus Park, representing a major investment in the growth of this sector by creating attractive conditions, and that has created a synergic dynamics and concentration of various business parks and corporate headquarters in its surroundings (eg: other business parks such as Lagoas Park or Quinta da Fonte, the hotels Lagoas Park or Holliday In Express, the golf course Cabanas and the shopping centre Oeiras Shopping).
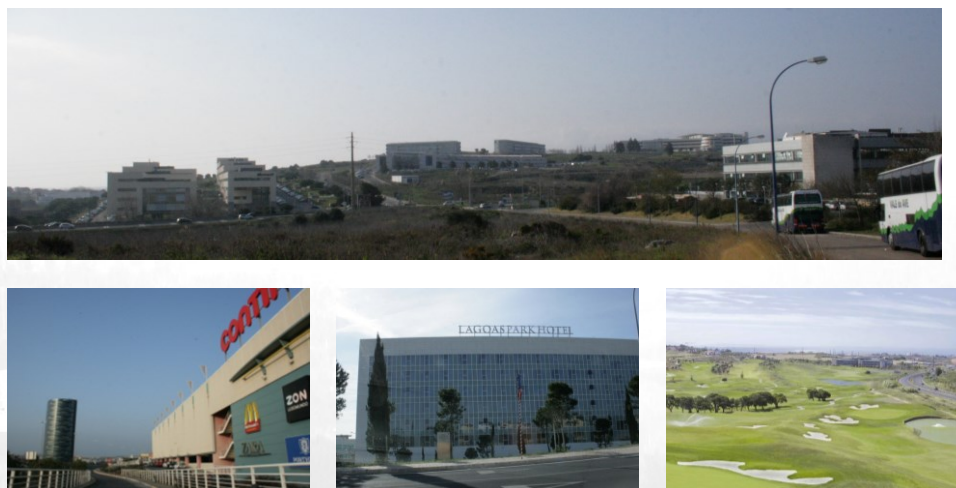
Fig.20-23: Science and Tecnology Park Tagus Park and surrounding area: Oeiras Park commercial area, Lagoas Park hotel and Cabanas golf course. Source: 2012, own elaboration and 2012, Esmedia.com.

3. Future challenges

The current organization of Lisbon's metropolitan territory is the result of a widening and intensification of the structure outlined in the 60's, followed by an urban explosion in the following decades that has led to the present redefining moment, when the future of the metropolis should be questioned and discussed.

A major challenge that arises from the brief analysis of this area concerns how to reduce and minimize the effects of this morphological and functional segregation, given the current economic and social changes and the need for conversion of various abandoned business spaces, promoting higher

environmental quality urban areas, their functional integration and their re-signification. This issue has a broader scope and has been widely discussed in international and multidisciplinary forums related to different European metropolitan areas, in order to establish a set of references that discuss topics functional, spatial, economic, energetic resource use and dialogue with the territory (BERGER, 2006, LLOP and BOSC, 2012, GIAMPINO, 2010, MANGIN, 2004, HANSEN and WINTHER, 2007, BONTJE and BURFACK, 2005).

The establishment and consolidation of this metropolitan filament between Lisbon and Cascais consisted in a dynamic process of layering of the territory that has been pointing towards an increasing functional specialization by the concentration of complementary programs, without a programmatic mixing. The mobility network played a decisive role in the establishment of the activities and the occupation of the territory, along with the biophysical conditions, the urbanization and, later, the planning activity. Thus, the emergent urban morphologies related to the concentration of economic activities follow location logics with a close relationship to the degree of connectivity, offered by the mobility network. In this way, the territorial hierarchy is defined by its connectivity were the airport, harbours, railways and the highway system form the high-speed mobility structure (at regional, national and international level), and the national roads systems ensure the local level of distribution and accessibility. It is based on the dialogue between these two systems that allows for the development of the metropolitan filaments along the transversal axes (national roads), that communicate with the high-speed network.

One approach to the problem could focus on the regulation of the emergence and consolidation process of these specialized areas, through planning tools that allow sliding between scales, from municipal to metropolitan scale. This wider interpretation is related to the project scale of the of high-speed mobility network, as well as the formalization of the metropolitan axis of economic activities clusters, which have no correspondence to the municipal boundaries and establish regional, national or international links. Thus, the main

problems identified for this part of the territory area are part of the metropolitan structure – the functional and spatial segregation of the economic activities originating a) daily commuting, automobile dependence, circulation difficulties and b) the inexistence of dialogue or synergy with the residential fabrics and with the biophysical layer, specially the Tagus estuary and the open spaces (as the Monsanto park), which play a key role in the construction of meaning and the metropolitan identity.

In conclusion, this axis could benefit from a functional and spatial restructuring and the creation of synergistic relationships, in articulation with the overall metropolitan system. However, the recent metropolitan changes, the frozen infrastructural projects, the unoccupied areas resulting from the abandonment of obsolete industrial areas or business closures and the emergence of specialized clusters, can be interpreted as an opportunity for regeneration and adaptation to contemporary needs, by creating aggregating strategies for the integration and reuse of the metropolitan filaments in the metropolitan structure.

This is one of the most important urban challenges for metropolitan Lisbon in the near future!

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CHOICES OF PLANTS IN LANDSCAPE ARCHITECTURE, ESPECIALLY IN RELATION TO HISTORICAL SOURCES

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The presentation will focus on how to make appropriate choices of plants in the designing of green areas, especially in relation to the local conditions, like genius loci and cultural heritage. Proper selection of plants is crucial in landscape architecture design. The most important is their suitability for the habitat, but, in today's globalizing world, suitability for historical and cultural conditions becomes more crucial. This is how we can respect and create an identity and uniqueness in a world that starts to look the same everywhere.

Study case:

To show this issue clearly, I would like to use a case study related to the reconstruction of an Early Middle Ages settlement in Northern Poland. I made some guidelines there for a planting plan. I prepared it using 3 methods:

1) traditional selection of native plants based on the use of phytosociology;

2) doing research on paleoecology and archeobotany materials made by scientists from The University of Gdansk;

3) searching for recommendations on the use of plant material for taking care of archaeological objects, in relation to the compositional aspect, and minimize the maintenance of vegetable planting.

The main goal which I needed to achieve was choosing plants which will become a part of the reconstruction of the life and customs of early inhabitants of the area.

Key words: phytosociology, paleoecology, archaeobotany, planting plan, native plants, cultural heritage, genius loci

In a globalized world, when cities begin to look the same, regardless of their location, the ideas of cultural heritage, an identity and uniqueness start to play a role. The identity and uniqueness can also be built by making adequate choices of plants in green area design, especially in relation to the local conditions. Proper selection of plants is crucial in landscape architecture design. The requirements for this selection are most of all suitability for habitat, what is clear, but also very important are genius loci and cultural heritage. This paper will show how to make adequate choices of plants with respect to all of these conditions. To show this issue clearly, I will use the case study related to reconstruction of an Early Middle Ages settlement in Owidz in Northern Poland. The research for proper plant species was quite multidisciplinary - besides phytosociology, traditionally used for searching native plants, paleoecology and archeobotany were also helpful.
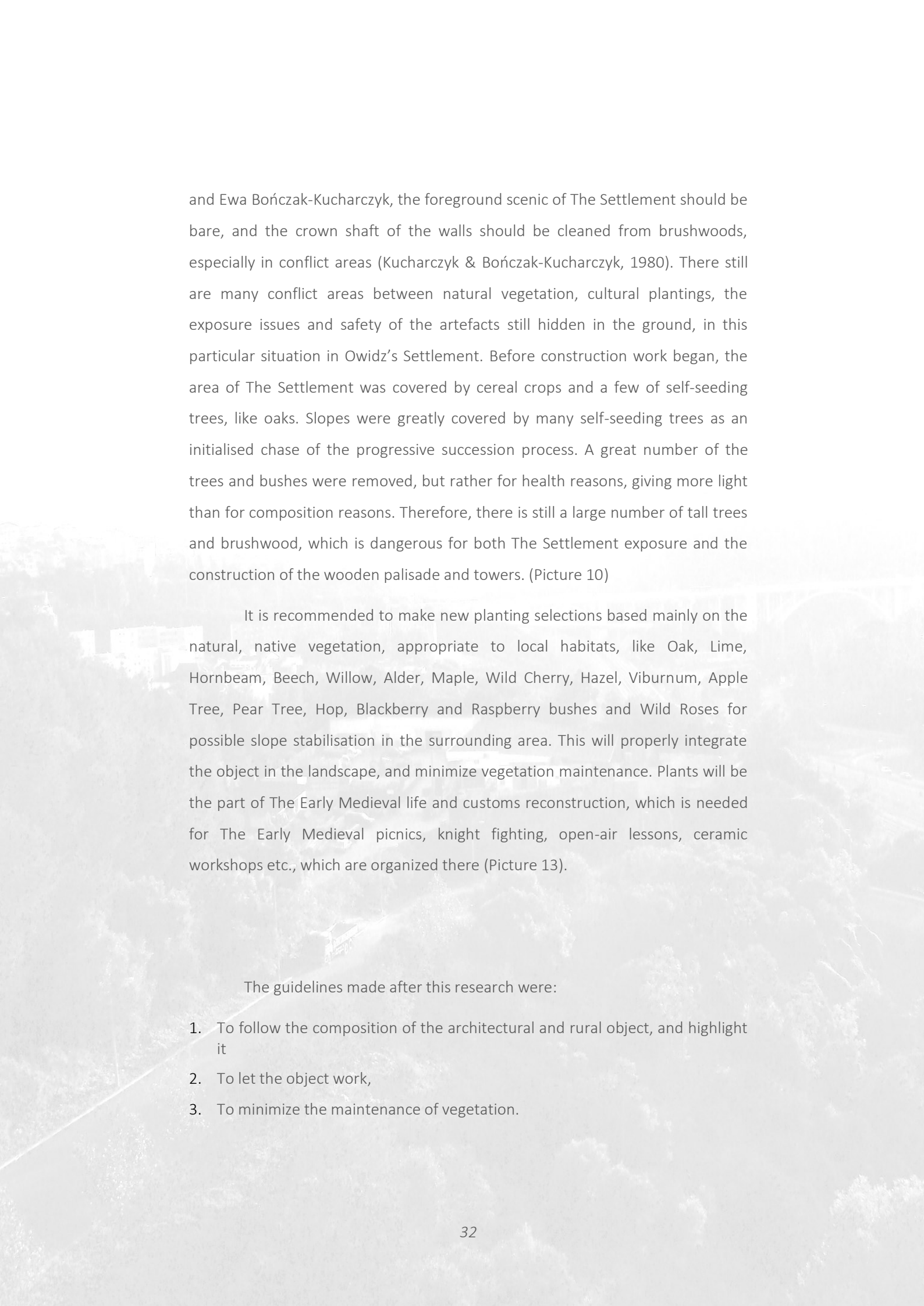
In this particular case, the Guidelines for planting plan were searched, regarding three methods:

— Searching for recommendations on the use of plant material for taking care of archaeological objects, in relation to the **compositional** and **functional aspect**, as well as minimizing the maintenance of vegetation.
— Traditional selection of native plants based on the use of **phytosociology**.
— Research done on **landscape archeology, paleoecology** and **archeobotany** sources, published inter alia by scientists from The University of Gdansk.

Ad. 1) I needed to do the research for reference objects. There are a lot great examples of using plants in archeological parks, ethnological parks and rural objects, places where plants are used for emphasizing the archeological heritage, old buildings, ruins in one place, completing them in another. Plants make them alive, together with animals and people. Probably one of the best and well-known examples is the Forum Romanum (Picture 1). Established by the archaeologist Giacomo Boni, this big Archaeological Park was designed precisely and uniformly to show what designers recognized as the most important. Other good examples of excellent 'cooperation' of archaeological heritage and plants are Jarlshof in Scotland (Picture 2), the settlement from the Bronze Age, Malbork Castle (Picture 3) where the planting plan was made by Bogna Lipińska, and Słowińska Village Museum in Kluki in Poland (Picture 4).

I recognized the problem area in the Owidz case study in this stage. The planting plan was formerly made, together with a development plan, but it did not complement the surrounding landscape and had nothing in common with early medieval environment. The location of The Settlement is shown in Picture 5 and 6. Picture 7 shows the design concept with the functional analyses. The reconstruction of The Settlement was already begun. The guidelines for the change in planting plan were needed. The reconstructed settlement is shown in Pictures 8 and 9.

Following the guidelines for the plant material used for the archaeological site's development, which were made by Krzysztof Kucharczyk

and Ewa Bończak-Kucharczyk, the foreground scenic of The Settlement should be bare, and the crown shaft of the walls should be cleaned from brushwoods, especially in conflict areas (Kucharczyk & Bończak-Kucharczyk, 1980). There still are many conflict areas between natural vegetation, cultural plantings, the exposure issues and safety of the artefacts still hidden in the ground, in this particular situation in Owidz's Settlement. Before construction work began, the area of The Settlement was covered by cereal crops and a few of self-seeding trees, like oaks. Slopes were greatly covered by many self-seeding trees as an initialised chase of the progressive succession process. A great number of the trees and bushes were removed, but rather for health reasons, giving more light than for composition reasons. Therefore, there is still a large number of tall trees and brushwood, which is dangerous for both The Settlement exposure and the construction of the wooden palisade and towers. (Picture 10)

It is recommended to make new planting selections based mainly on the natural, native vegetation, appropriate to local habitats, like Oak, Lime, Hornbeam, Beech, Willow, Alder, Maple, Wild Cherry, Hazel, Viburnum, Apple Tree, Pear Tree, Hop, Blackberry and Raspberry bushes and Wild Roses for possible slope stabilisation in the surrounding area. This will properly integrate the object in the landscape, and minimize vegetation maintenance. Plants will be the part of The Early Medieval life and customs reconstruction, which is needed for The Early Medieval picnics, knight fighting, open-air lessons, ceramic workshops etc., which are organized there (Picture 13).

The guidelines made after this research were:

1. To follow the composition of the architectural and rural object, and highlight it
2. To let the object work,
3. To minimize the maintenance of vegetation.

Ad. 2) The next step covered phytosociological guidelines. According to The American Heritage Dictionary, 3rd ed, **Phytosociology** *is the study of the characteristics, classification, relationships, and distribution of plant communities*. Phytosociologists try to include higher levels of complexity in the perception of vegetation, namely by describing completely **successional** units (**vegetation series**) or, in general, vegetation complexes. These lie in the scope of **Landscape Phytosociology.** Owing to landscape phytosociology, landscape architects can make plant selections appropriate to the habitat and microclimate conditions. To do that, phytosociology gives us tools like:

Plant community (also phytocenosis) - a collection of plant species within a designated geographical unit, which forms a relatively uniform patch, distinguishable from neighboring patches of different vegetation types. The components of each plant community are influenced by soil type, topography, climate and human disturbance (Gobat, et al., 2004).

Ecological succession – sequential change in the relative abundances of the dominant species in a community (dominance based on biomass). Sequential implies that a once-dominant species or group of species will not become dominant again unless a disturbance or other environmental change intervenes. This process is dinamic and possible to predict and manage. We may speak of **progressive succession**, which tends upwards to the stable optimum or climax, and of regressive succession, the opposite. (Glenn-Lewin, et al., 1992).

The source of types of natural plant associations in an environment of Settlement in Owidz was *Potential vegetation map of Poland* published by J.M. Matuszkiewicz (Matuszkiewicz, 2008). Three main plant associations (communities) were found. Two of them overgrow the highest levels of the ground. The first is *Fago Quercetum* – The Pomeranian Acidofil Oak – Beech Forest, with Oaks (*Quercus*), Beech (*Fagus sylvatica*), Woodbine (*Lonicera periclymenum*), Bracken (*Pteridium aquilinum*), Bilberry (*Vaccinium myrtillus*) etc. The second is *Stellario Carpinetum* – The Sub-Atlantic oak-hornbeam forest, natural mixed forests composed of Hornbeam (*Carpinus betulus*), Oaks

(*Quercus*), Lime Tree (*Tilia cordata*), Beech (*Fagus sylvatica*), Chickweed (*Stellaria holostea*), Galium (*Galium sylvaticum*), Bird Cherry (*Prunus avium*), Wild Ginger (*Asarum europaeum*), Hazel (*Corylus avellana*), Ivy (*Hedera helix*), Viburnum (*Viburnum opulus*), Maple (*Acer*), etc. The area along the Wierzyca River with sand and gravel sediments belongs to the third plant community: *Alno-Ulmion* – the Riparian Forest (Picture 11), consists of Alders (*Alnus*), Elms (*Ulmus*), Currants (*Ribes*), Poplars (Populus), Willow shrubs (*Salicetum*) and Rushes (*Phragmitetea*) with Reeds scrubs. This is an excellent base of plant species for plant selection design.

Ad. 3) The last step was to make guidelines based on landscape archaeology, paleoecology and archeobothany. Landscape archaeology is the multidisciplinary and multifaceted approach. It is the study of the ways in which people in the past constructed and used the environment around them, based on archaeological excavations, surviving artefacts and fossils, material makers, dynamic range of behaviours, ecological communities and resources, and the geological landscape. Paleoecology reconstructs the historical ecosystems using information from fossils and subfossils, involving the study of fossil organisms and their related remains, as well as their life cycle, existing relations, natural environment, and cause of death and burial to reconstruct the paleoenvironment. Quite similar is archeobothany, which studies the plant relics from archaeological sites for better understanding of the environmental background of ancient societies and also how the environment was exploited and adapted. The research in particular includes diet and food procurement, throughout gathering or farming, and the conversion of plants and landscapes through domestication. The types of plant remains studied here include macro-remains (from seeds, wood, and parenchyma tissues) and micro-remains (especially phytoliths and starch grains).

The information about natural communities growing in the northern part of Poland in the Early Middle Ages was taken from paleoecological elaborations based on fossil analyses and the analysis of the plant macroscopic remains

acquired from excavations. This research is led by botanists from the Laboratory of Paleoecology and Archeobothany, the Department of Plant Ecology at the University of Gdansk. Based on their research we know that the test area in the Early Middle Ages was overgrown mostly by deciduous forests, with an overwhelming number of Oaks and Beech, Hornbeam, Linden, etc, while covering the river were mainly alders and willows. This vegetation is consistent with today's potential vegetation surrounding Settlement, mentioned above.

There were excavations conducted in the Early Medieval Settlement in Owidz. The locations of the excavations were elaborated by A. Ostasz, as shown in Picture 12. Unfortunately, archeobothanical research was not conducted there. The guidelines were made based on the literature research made on paleoecology and archeobotany materials written by scientists mainly from The University of Gdansk in the Pomeranian region and in excavations nearby in the Old Town in Gdańsk, Tczew and also many excavations from the Early Medieval Settlements from the Wielkopolska Region and wider still, all Early Medieval Poland. Describing the importance of the archaeological finds of plant, authors mention crops, gathered plants, and feed. They also try to reconstruct business processes and edaphic conditions of crops. A valuable source of information about the historical vegetation in Poland is Zbiegniew Celka's publication (Celka, 2005), describing the remnants of the old crop in contemporary Polish flora. However, a set of plants gathered by humans for food and how it was used by them can be found inter alia Ewa Twarowska publication (Twarowska, 1983).

The final list of useful plants occurring in this region which could be used for planting plan in Owidz was based mainly on Monika Badura (Badura, 2011) and Maria Lityńska-Zając's (Lityństa-Zając, 2007) works. The plants are divided into: cereals (like Oat, Rye, Barley, Millet, Lentil, Buckwheat, Poppy Seed), vegetables and fruits (like Parsnip, Rutabaga, Cabbage, Onion, Garlic, Apple, Pear, Cherry, Plum) nuts (like Hazel, Walnut), oil- and fiber-plants, (like Linen, Hemp) and Hop.

Summarizing the research made for the guidelines above we obtain quite universal methodology for making appropriate choices of plants, especially in relation to historical sources which may have a wider application in Landscape architecture.

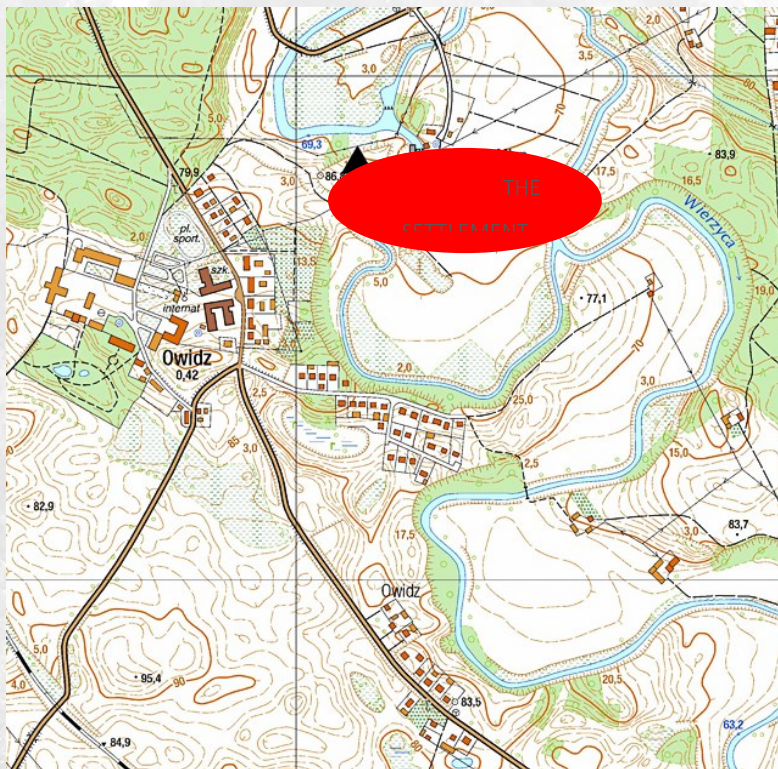Picture 1: Forum Romanum. Author: Joanna Rayss

Picture 2: Jarlshof, Scotland, Bronze Age Settlement, Source: http://www.facebook.com/nefeli.aggellou

Picture 3: Early Medieval garden In Malbork Castle designer by Bogna Lipińska, Source: www.zamek.malbork.pl

Picture 4: Słowińska Village Museum in Kluki in Poland, Author: Aleksander Seniów

Picture 5: Topography map, scale 1:10000, Owidz, Municipality of Starogard Gdański

Picture 6: The site – birds-eye view Author: J. Miałdun
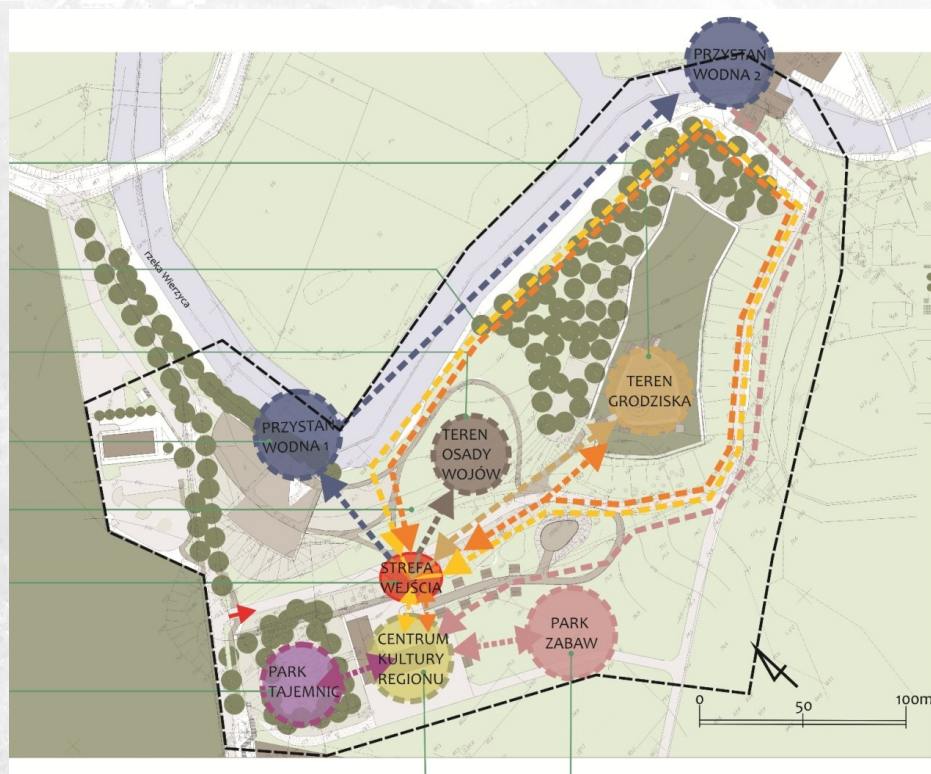
Picture 7: The design concept with the functional analyses, made by Pracownia DW

Picture 8, 9: The Reconstructed Settlement In Owidz. Author: Joanna Rayss

Picture 10: The collision plants, Author: Joanna Rayss

Picture 11: Alno-Ulmion – the Riparian Forest along The Wieżyca River, Author: Joanna Rayss
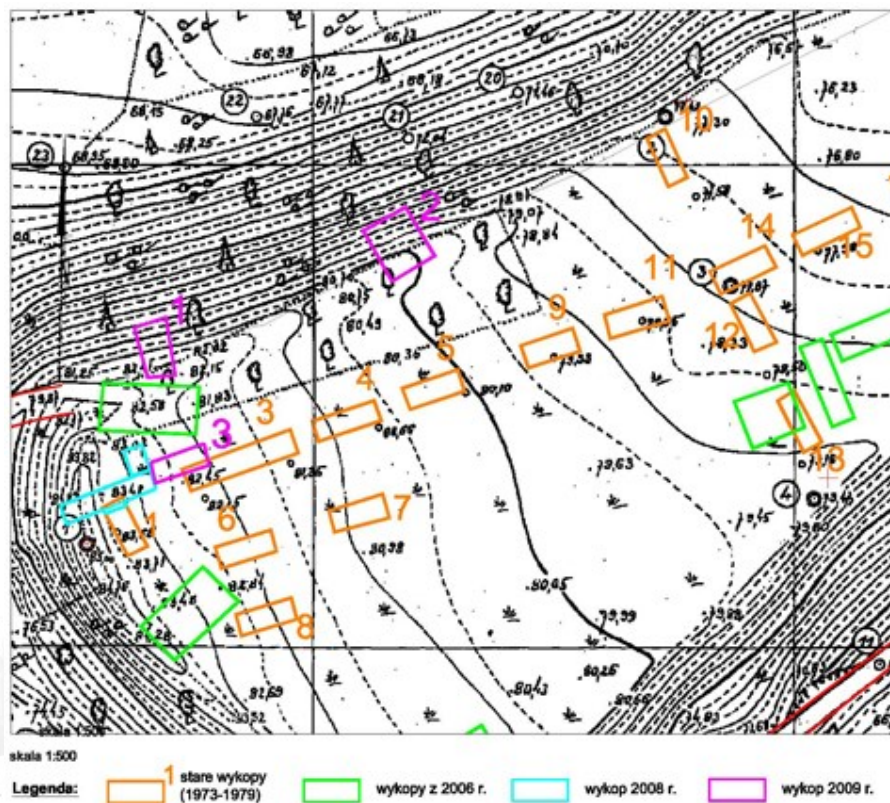
Picture 12: Location of excavations in the Early Medieval Settelment in Owidz, elab. By A. Ostasz

Picture 13: The Everyday life of The Owidz's Settlement

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FINDINGS OF URBAN SHRINKAGE IN RECENTLY DEVELOPED URBAN AREAS IN THE LISBON METROPOLITAN AREA

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Presently, Europe is facing both population decline (shrinkage) and ageing. Eurostat estimates that population decline is experienced in one quarter of the European regions, and it is expectable that the ratio would continue to grow in the near future. In the same way, the life expectancy, due to better living conditions and medical care, is predicted to increase by five years in the next 40 years.

When extending the analysis of population dynamics to the Lisbon Metropolitan Area (AML), we found that it is one of the two territorial units of the country that reveals a positive population growth, to nearly 3 million inhabitants (grew almost 6% between 2001 and 2011 censuses).

As for housing, in Portugal the number of conventional dwellings continues to exceed largely the number of households. In 2011 census the number of dwellings at national level exceeded in almost 50% the number of families. The Lisbon Metropolitan Area (AML), in the same period, has registered an increase of almost 15 % in conventional dwellings (more 191 000 units) and the number of households has increased by 14 %, corresponding to more 142 000 households, which means a dwelling surplus of almost 35 %. **Nearly half of these vacant dwellings, mostly located in the peripheral municipalities of the administrative Lisbon perimeter, were available in the housing market for sale and were built during the last decade.**

Policies that aim to cope with demographic and housing changes, mostly due to the economic crisis that most of the European countries are facing, are now more challenged by the housing market oversupply problem, the changes in population development and by structural changes and increasing mobility of households. According to EUROCITIES the new household types in particular are often only transitory users of urban space, and are likely to change their structure, size and place of residence quite frequently. These dynamics lead to a social diversification and fragmentation of the urban fabric. Demographic change is not a phase that leads to new fixed structures, but an ever-ongoing process.

This paper is part of an in-progress research aimed to explore one of the hypotheses of my doctoral dissertation: Despite the population growing scenario, shrinkage occurs in specific urban areas of the Lisbon Metropolitan Area (AML);

KEYWORDS: Shrinkage; Demographic change; Lisbon Metropolitan Area; Housing; Vacancy

Introduction

"Policies that aim to respond to demographic change are even more challenged by the increasing mobility and fluidity of households. New household types in particular are often only transitory users of urban space, and are likely to change their structure, size and place of residence quite frequently. Demographic change is not a phase that leads to new fixed structures, but an ever-on-going process. One of the basic characteristics of the structures that are evolving, regardless of whether they are households, housing markets or residential patterns, is their flexibility and transience. The result is an increase of social and demographic fragmentation in the urban space." (EUROCITIES, 2008)

The European Union EU 27 is currently experiencing a population growth scenario, mainly due to a positive net migration. Exceptions are the state members of Spain, France, the Netherlands, Slovakia and the UK, where the natural population change is leading to the population growth. Countering the widespread trend in the European context, eight Member States verified a population decline trend, particularly in the Baltic States (Estonia, Latvia and Lithuania), in Eastern European countries (Bulgaria, Hungary and Romania), in Germany and in Malta (see Figure 1.). This population decline is mainly due to a negative natural increase and net migration. (EUROPEAN COMISSION, 2010)

The demographic forecasts suggest that the number of cities in shrinking process tends to increase in the future. (RIENIETS, 2005). In the same way, the life expectancy, due to better living conditions and medical care, is predicted to increase by five years in the next 40 years (In men growing from 75.7 years to 80.5 years and in women from 80.4 to 85.6 years). (ESPON, 2009)

The XXI century urban shrinkage can be characterized by a multidimensional phenomenon encompassing regions, cities, and parts of cities or metropolitan areas that are experiencing a dramatic decline in their economic and social bases. The causes of this urban decline are many and complex, though one common denominator is that each

"shrinking city" has been significantly impacted by the forces of globalization (PALLAGST, 2007)
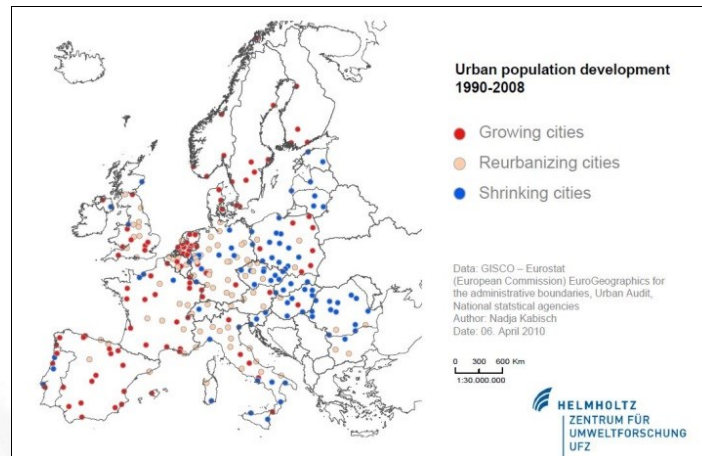

Figure 1. Urban Population development 1990 – 2008 | Author: Nadja Kabisch - 2010

The Lisbon Metropolitan Area (LMA) follows the general demographic trends verified in Europe developed regions, showing an ageing process of the population, especially in the Lisbon municipality city core. Moreover, the demographic decline, caused by population loss, structural changes in household composition and household size (households are becoming smaller), continuous decline in fertility rates, results in the decrease of the young and working-age population groups and consequent increase in elderly population group and is a widespread challenge to the European territory. The demographic decline experienced in the capital contrasts with the population growth occurring in the Metropolitan Area.

Methodology

The methodology followed in this study is based on empirical observation and on different information sources (cartography and censuses data), selected

and analysed with Geographical Information Systems (GIS) tools. For the analysis, and supporting the cartographic information, we used statistical data form the Portuguese statistical institute (Statistics Portugal - INE), referring to Lisbon Metropolitan Area (AML). The Statistics Portugal provides the Geographic Information Referencing Base (BGRI), corresponding to a georeferenced polygon-based that contains the census data spatial outline at the statistical section and statistical subsection level. For optimal accuracy, the data is at the statistical subsection level, and describes a set of socio-demographic variables divided in six main groups describing: buildings, families, households, age structure, education levels, and economic activities.

Demographic trends within the Lisbon Metropolitan Area

When extending the analysis of population dynamics to the Lisbon region, we found that it is one of the two territorial units of the country that reveals a positive population growth. According to the 2011 Census, between 2001 and 2011, the Lisbon Metropolitan Area (AML) population grew by 5.7% (more almost 160 thousand residents), to nearly 3 million inhabitants. In the same period, the Lisbon Sub-region total population increased by over 5%, to 2 million residents. The growth rates across the Lisbon Sub-region, ranged from a decrease of 3.4% in Lisbon municipality to an increase of 41.2% in Mafra municipality. The Setubal Peninsula Sub-region total population grew 8.9% in the same period, largely due to the increases in population growth rates in Alcochete (35%), Montijo (31%) and Sesimbra (31%) municipalities (see Figure 2.). Comparing with the 2001 Census results, it's possible to verify that the municipalities of Mafra, Sesimbra and Alcochete held a strong growth and the municipalities of Sintra and Seixal, who had verified a considerable growth in the last censitary period, now had modest growth (about 4% and 5% respectively). (INE, 2011)
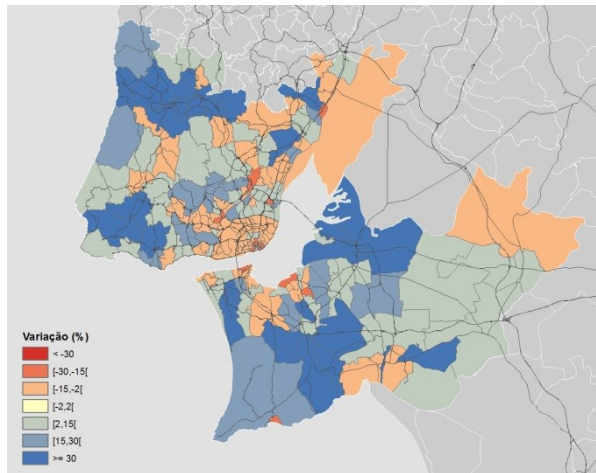
Figure 2. Population change (%) in Lisbon Metropolitan Area (AML)
Author's calculation based on data from Censuses 2001 and 2011 (INE).

In Portugal, according to the Population Reference Bureau, in 2011 the share of population aged 65 years and over was almost 18%. Although the highest percentage of younger residents can be found in Lisbon Metropolitan Area (LMA), the city of Lisbon is also one of the European capitals with higher percentage of population (24,2%) aged 65 years and over (see Figure 3.)

According to the 2011 Census preliminary results almost 1 in every 5 (18.4%) AML region residents is aged 65 and over, while 1 in 4 (26.0%) is less than 25 years old. These percentages are slightly below the national average of 19.2% in residents aged 65 and over and also below the 25.2% of less than 25 years old residents. This is mainly due to a high percentage of young active population in the metropolitan area where there is greater demand for labour and also due to a very relevant influx of immigrant population. Moreover, 3 in every 5 (62.4%) of the residents aged 65 and over live in households where all members are from the same group age, and 1 of those 3 lives alone (35.7%).(INE, 2011)
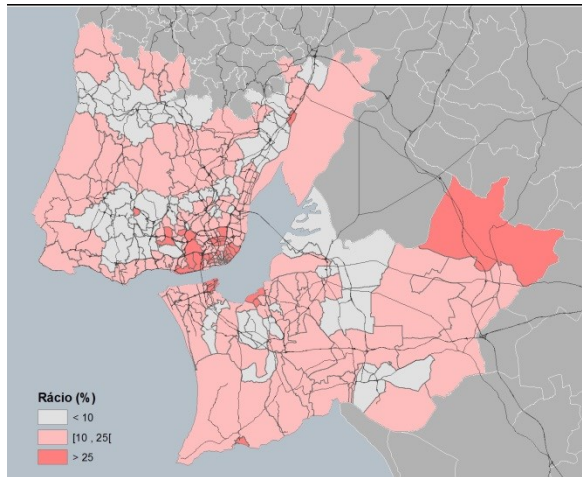
Figure 3. Proportion of elderly people (65+) in Lisbon Metropolitan Area (AML); Author's calculation based on data from Census 2011 (INE).

Most of the elderly residents are low-income people living in the historic inner-city municipal parishes, in rented dwellings due to inflexible rent control laws in effect between 1948 and 1985 and with low expectations in what concerns residential mobility in the future.

The younger residents and large families, looking for high housing standards, with more generous areas and better urban amenities, choose the surrounding municipal parishes and can explain the lower youth percentage in the city centers. Both the physical deterioration affecting most of the buildings and urban amenities in the city core and the fact that they don't provide the requirements for actual housing standards led to an inner-city decline and depopulation. These trends are accompanied by a decrease in the household size (in Lisbon dropped from 2.4 to 2.2 persons per household) and changes in its classical structure, resulting in a minor density and in the under-usage of dwellings and consequently in a higher housing space consumption (area per resident consumption.). (see Figures 4. and 5.)
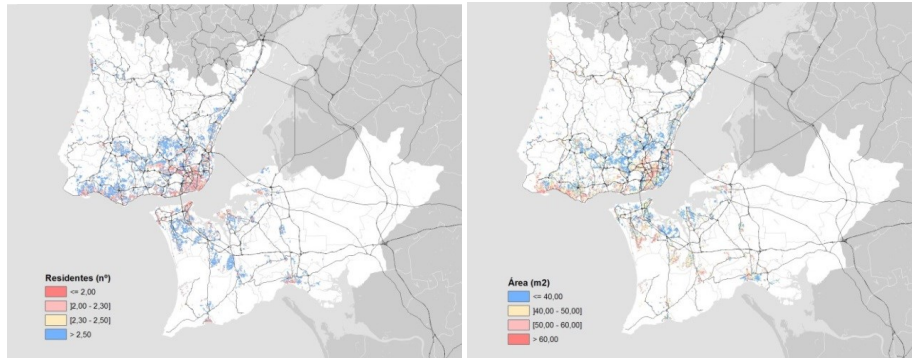
Figure 4. Household size in Lisbon Metropolitan Area (AML)
Author's calculation based on data from Census 2011 (INE).

Figure 5. Area per resident consumption (m2) in Lisbon Metropolitan Area (AML)
Author's calculation based on data from Census 2011 (INE).

Housing trends within the Lisbon Metropolitan Area

As for housing, in 1970 the number of families in Portugal slightly exceeded the number of conventional dwellings, however, this trend has reversed rapidly and in the last three decades the number of conventional dwellings exceeds largely the number of households. After 1975, mostly due to the return of the immigrants from former Portuguese colonies, there was sudden population increase, resulting in a considerable pressure on the housing market. (DGOTDU, 2004)

In 2011 Census the number of dwellings at national level exceeded in almost 50% the number of families.Between 2001 and 2011 censuses, the ratio of conventional dwellings increased by almost 17% (839 thousand units) to approximately 6 million units and the household ratio grew by almost 12 %, to 4 044 100 households or more 425 thousand households. The AML region, as seen in figures 6. and 7., in the same period, has registered an increase of almost 15 % in conventional dwellings (more 191 000 units) and the number of households has increased by 14 %, corresponding to more 142 000 households, which means a dwelling surplus of almost 35 %. Most of the AML region conventional dwellings are occupied (76%), in which two thirds (67%) are owner-occupied dwellings, 27% are occupied by tenants and 6% were related to other kind of

occupation. Moreover, 12.5% of these conventional dwellings are vacant and 11.5% are used as second residence. Nearly half of these vacant dwellings, mostly located in the peripheral municipalities of the administrative Lisbon perimeter, were available in the housing market for sale and were built during the last decade. Only 12% of these dwellings are aimed for the rental market (see figure 8.). (INE, 2001; INE 2011)
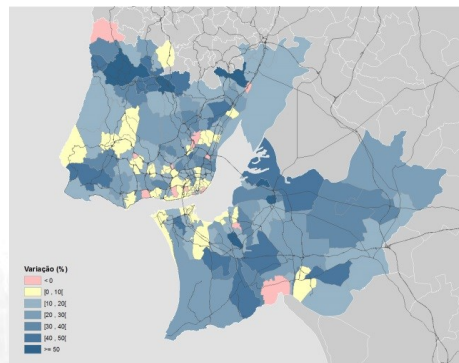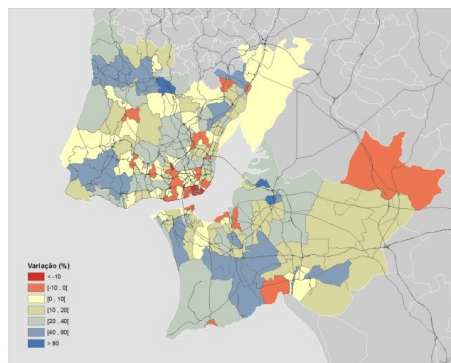

Figure 6. Conventional dwellings change (%) in Lisbon Metropolitan Area (AML)
Author's calculation based on data from Censuses 2001 and 2011 (INE).

Figure 7. Household change (%) in Lisbon Metropolitan Area (AML)
Author's calculation based on data from Censuses 2001 and 2011 (INE).

This trend leads to an even higher number of vacant dwellings and suggests the existence of a housing market geared towards new housing developments and the existence of conventional dwellings that are not intended to usual residence. (INE, LNEC, 2013)

We have moved from a relatively balanced situation verified in the Census 1981, when the number of conventional dwellings was 16% higher than the number of households, to a surplus situation in Census 2001 and to a clearly surplus in Census 2011. In the last Census, the number of conventional dwellings was 45% higher than the total households, corresponding to 1.45 dwellings per household. (INE, 2012)
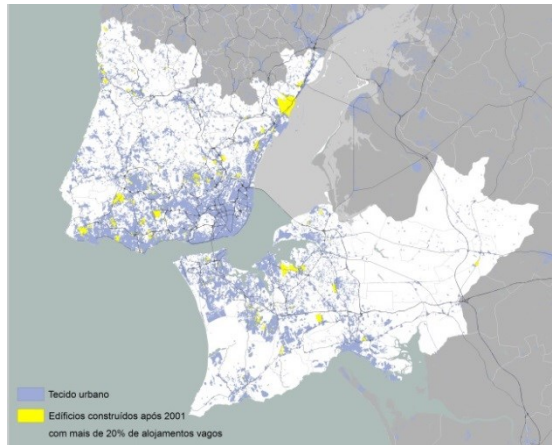
Figure 8. Vacant conventional in recently developed urban areas (after 2001) in Lisbon Metropolitan Area (AML); Author's calculation based on data from Census 2011 (INE)

Findings

Mainly in recent years, Lisbon metropolitan area has experienced a meaningful growth in periphery urban development areas, with significant land consumption, along with a depopulation process at the city-core. Several decades of inflexible rent control laws urged households to move to suburbs or to the countryside, leaving the city-centers abandoned and decaying. As result, the number of homes has grown at a rate higher than that of the population, leading to an oversupply in the housing stock and consequently to high vacancy rates. This urban development could lead to consider that in the Lisbon metropolitan Area there is no housing demands, however, it's not possible to move the housing surplus to the necessary locations. Thus, the comparison between the geographic distribution of households and the housing demand for that urban area reveals some discrepancies between supply and demand for housing.

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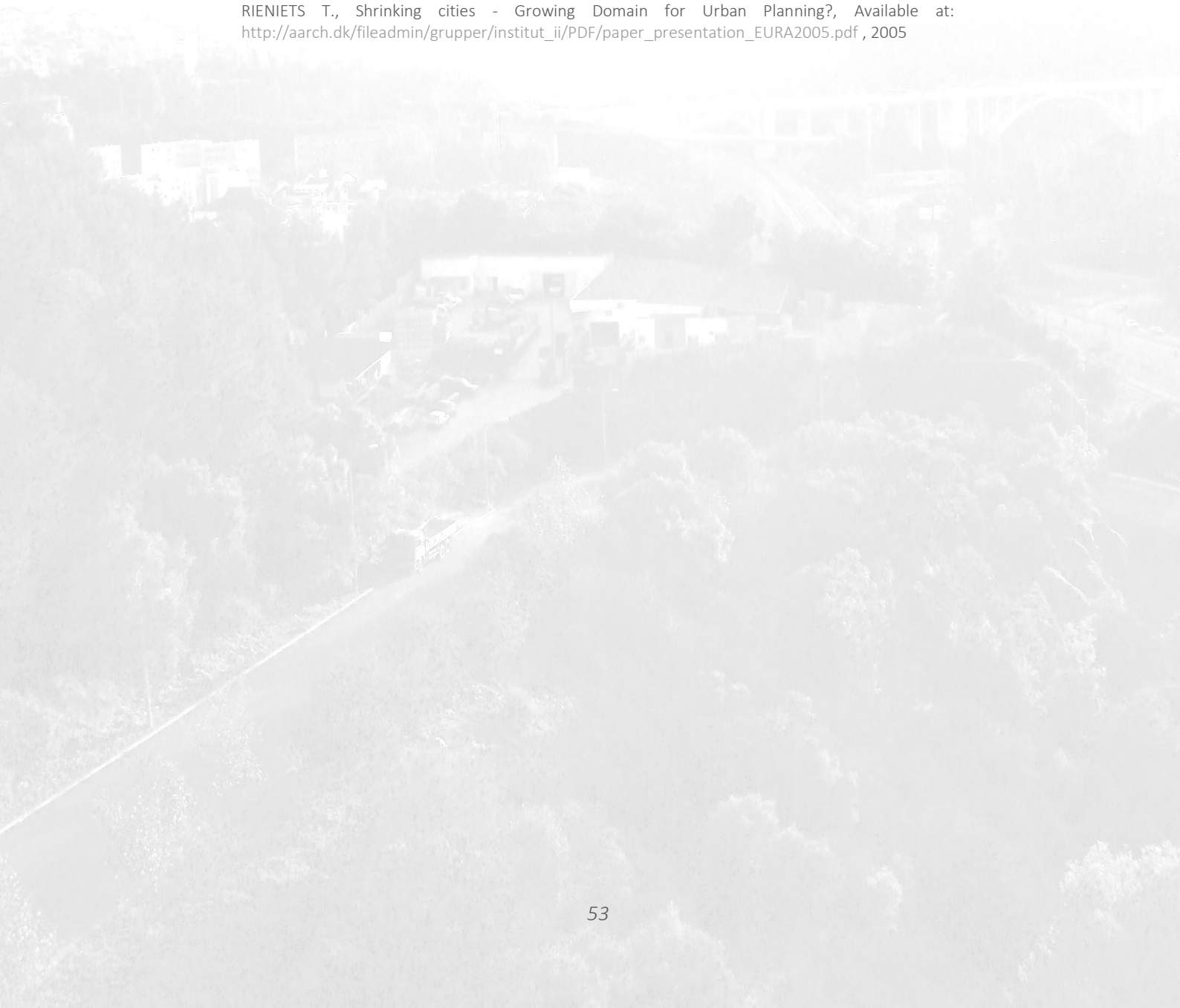
*I*N THE CITY OF THE FUTURE WATER WILL BE IN THE CENTRE OF URBAN PLANNING

A methodology to quantify and evaluate the sustainability of the systems which are part of the urban water cycle, based on the metabolism model

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To ensure economic growth and simultaneous sustainable development implies that we change the paradigm. The city and their multiple systems, namely the urban water cycle, should be rethinking. Abandoning a metabolic system of a linear type to approach a circular type one can be a solution

Key words: Urban metabolism, urban water cycle, sustainable city, cities of the future, sustainable development

Introduction

The growth of world population, specially less developed countries together with the significant rise of middle class in emerging economies, low cost energy (oil) depletion, climatic changes that are disturbing the hydrological cycle and the effects of quick urbanization, have been causing an unsustainable pressure on the available natural resources.

It is estimated that 90% of the 3 billion people that will be added to the current population up to 2050 will live in developing countries in which the population nowadays have neither sustainable access to clean water nor sanitation of wastewater.

Today many of the cities in developing countries haven't yet been able to suit their supply, drainage and treatment systems to the mark defined on the last decade of the XX century.

If we want to guarantee economic growth together with sustainable development in our future we must change the paradigm. We must rethink how we have been planning the city and all their systems, namely the system of the urban water cycle.

The transition to a new paradigm implies that we abandon the open linear metabolic cycle to the circular metabolic cycle, in order to promote the preservation and reuse of resources, by reducing our ecological footprint.

By integrating the current centralized systems as new decentralized management systems, pushing the traditional borders of urban water management to areas where we can achieve greater efficiency in water management and urban planning.

Historically the water has always had a large influence in the location of cities, but the entities that manage the urban water cycle have still a limited influence on decisions, which affect their form and density.

The purpose of a sustainable development in the "City of the Future" based on the circular metabolic system implies conception and management of the urban water cycle in an integrated manner with city planning. This allows the promotion of better sustainable solutions than when managed separately.

The transition to a more sustainable urban water cycle can be achieved with strategic planning.

Considering the multiple technical and management options that contribute to the sustainable development of the city, especially to the urban water cycle systems, we must establish a conceptual model that evaluates the quality and quantity regarding multiple scenarios and the many alternatives available that better suit the city.

Employing the Metabolism Model applied to the urban water cycles will allow us to examine and understand how to improve the sustainability quality from the metabolic point.

Transition to a more sustainable urban water cycle

By advocating that water shall be placed in the center of city planning, we appeal to the need to use another paradigm that wishes to manage in a

integrated way the multiple systems of the urban water cycle, combining engineering, architecture, environmental and social sciences, the values and desires of the community that govern the city planning decisions.

To transition to a more sustainable urban water cycle we need guidance. With guidance the management should be able to plan and implement an itinerary to achieve the goals, serve as a communication tool to a solid and coherent approach.

An itinerary can be a useful tool to achieve the sustainability goals in a medium-long term period.

SWITCH (2006) and TRUST (2010b) projects produced transition itineraries that follow diverse methodologies, but having in common a strategic planning as support for a long-term change.

Ralph Philip, Barbara Anton, Peter van der Steen (2011) propose a methodology that allows the city to change the current urban water cycle to a better one in the future.

Also Andreas Hein, Marina Neskovic, Rita Hochstrat, Heather Smith(2012) propose an itinerary that gives management a tool to plan and implement a way to achieve the goals.

Both methodologies refer the need to initiate a change process, building a platform where all concerned parts shall participate, preparing strategically for transition following determined methodologies.

Enforcing a sustainable urban water cycle can't be a solitary process, but the result of a sustainable management.

Changes are needed at many levels so that urban water management occurs; government structures, city planning policies and appropriate attitudes from those who use or are responsible for management.

This change can work, if implemented in a long-term period with incremental efforts from the main characters (Ralph Philip, Barbara Anton, Peter van der Steen 2011).

To achieve a sustainable urban water cycle the city shall decide to use simultaneously, a series of tools or instruments, which might accelerate that change. Some are present in figure 1.

Being the urban water cycle linked directly or indirectly to other city sectors (e.g. housing, transportation, energy, etc.). An integration approach requires a participation and cooperation of these sectors. But actually these connections are often neglected when decisions are being made.

Thru integrated planning and cooperation between different services, implementing certain solutions shall be much easier.

Jefferies, Duffy, University of Abertay Dundee (2011), refers that transition is a concept that aims to influence the structural change of complex systems in the long-term by experimentation and implementing new technologies. In the city context the transition to a sustainable urban water cycle will be a structured transformation and proposes four approaches to that transition: multiphase concept, multilevel perspective, transition management and niches of opportunity.

On the other hand Andreas Hein, Marina Neskovic, Rita Hochstrat, Heather Smith (2012) present another methodology based on the Behrendt (2007) approach, with four stages: *Scoping, Forecasting, Backcasting e Transfer*. In each stage a different number of steps exist, designed to help communication in the iterative work of information collection, to evaluate the coherence and determine ways of adapting to the future needs of a sustainable urban water cycle.
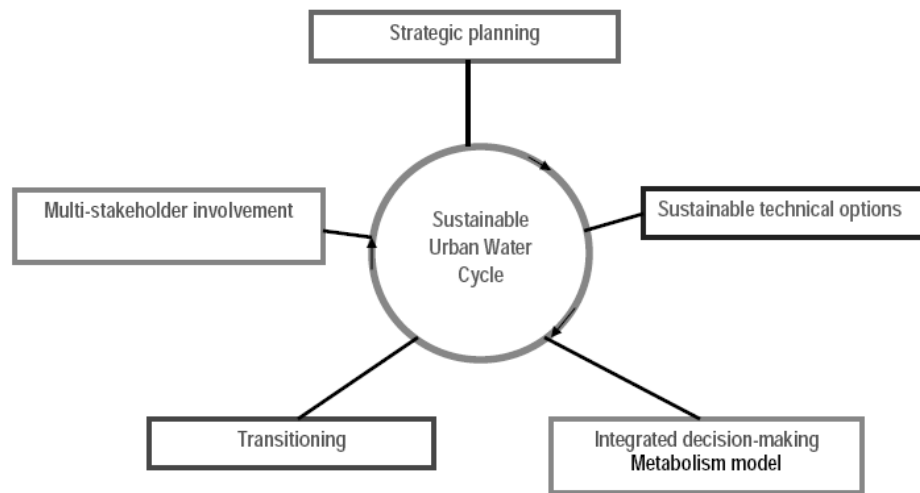
Figure 1 – Instruments and means to move to a system of sustainable urban water cycle. Adapted from: (Ralph Philip, Barbara Anton, Peter van der Steen 2011)

Strategic planning

The process of strategic planning for a sustainable urban water cycle must be a long-term process.

It shall be based in developing and implementing flexible strategies that in a holistic manner involves all the systems of the water cycle, as well their connections to other city sectors.

Selecting solutions prone to be more successful than others will facilitate the optimization of the urban water cycle, considering multiple scenarios in an uncertainty future.

The main purpose of a strategic planning is to sustain, strengthen and add coherence to the decision making process of managing by identifying the key factors, internal and external, that affect the activity (Alegre, Covas 2010).

The strategic planning has a number of phases that allow results to be screened in a regular basis.
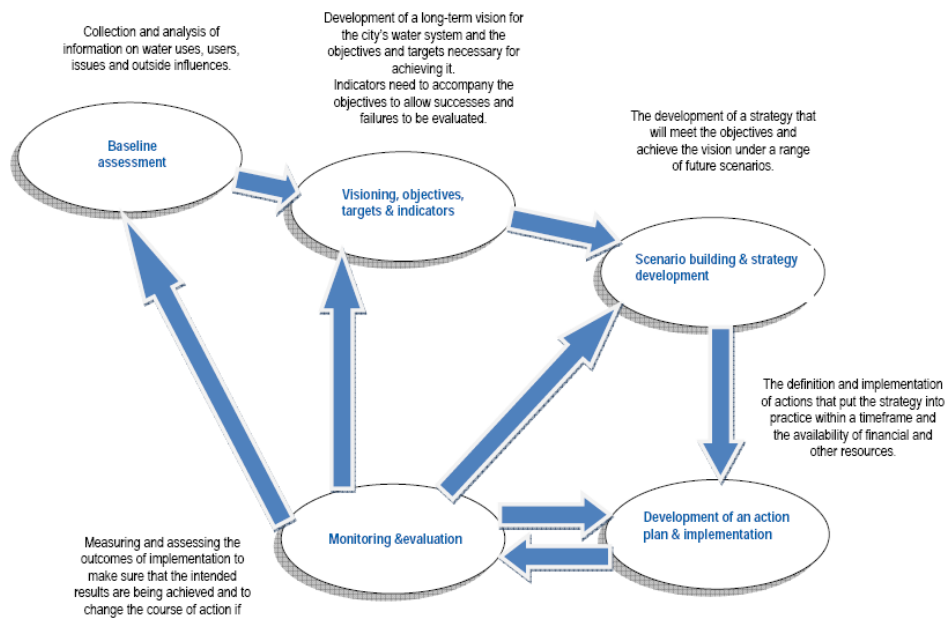
Figure 2 – Phases of strategic planning system of sustainable urban water cycle. Source: (Ralph Philip, Barbara Anton, Peter van der Steen 2011)

This methodology delivers a structure that eases the change to more integrated policies, a governance structure and the option and practice of technologies that allow for a more sustainable urban water cycle management.

In figure 2 the strategic planning is presented as a logical sequence of phases, however there is a great level of iteration between them. Even though the order of tasks may vary there is a necessity of continuous results revision for a coherent strategic planning process. This continuous revision is made through the analysis of certain indicators that allow the progress measurement.

By developing a strategic planning process for the urban water cycle, urban planning can be influenced by the definition of priorities.

Managing the urban water cycle holistically implies the involvement of all the city's water stakeholders.

Stakeholders

When we wish to initiate a process of integrated management of the urban water cycle, designed to make it sustainable, and at the same time obtain success in the implementation we cannot leave a part any of the stakeholders.

Experience shows us that those directly influence the management of the urban water systems are not used to working together. Even on the unusual occasions when working together is a reality we rarely find managers with a holistic vision of the urban water cycle. This leads to solutions that take into account one of the parts but not the process as a whole. To prevent this problem Ralph Philip, Barbara Anton, Peter van der Steen (2011) propose the implementation of a coordination entity, able to evaluate the many options considering the system as whole.

The involvement and commitment of the city politicians, with responsibilities at the highest level, is of the major importance in the support of the strategic planning and essential to initiate the transformation process.

The transition to a sustainable urban water cycle must start by choosing a small group of people whose relation to the cycle is more obvious. That small group should then be responsible of choosing a complete list of stakeholders invited to join the process(Barbara Anton 2011) e (Andreas Hein, Marina Neskovic, Rita Hochstrat, Heather Smith 2012).

Framework for sustainability assessment system of urban water cycle

To evaluate to operation of the urban water cycle, compare management and technological alternatives it is necessary coherence and harmonization between the performance evaluation tools.

The TRUST (2010a) project defined an evaluation chart using the three main dimensions: the economic, social and environmental triangle; and the supporting dimensions - assets and governance.

"Sustainability in urban water cycle services (UWCS) is met when the quality of assets and governance of the services is sufficient to actively secure the water sector's needed contributions to urban social, environmental and economic development in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs".(Helena Alegre, Enrique Cabrera, Andreas Hein, Helge Brattebo 2012).

Sustainability evaluation on that project is related to:

—— the five dimensions of sustainability;

—— the need to obtain information that allows the improvement of management, assets development and the governance of the urban water cycle as part of a transition strategic process;

—— The evaluation is operationalized in a critical form, through a careful analysis of a bundle of chosen indicators fulfilling predefined sustainability goals and evaluating criteria. The indicators can be qualitative and quantitative and are specifically chosen to consider the context and challenges of a system in a medium or long-term transition;

—— The sustainability evaluation method must be transparent valid and holistic based on metabolism and the life cycle. The method shall be flexible towards the stakeholders and the decisions on the definition of objectives and trade-off, being part of a multi-criteria decision-making process.

Urban Metabolism

Metabolism is the group of chemical and biochemical reactions that occur in a living organism. This process allows the organism to grow, breed and respond to the involving environmental. The concept of metabolism has been applied not just to biological systems but also to urban and industrial. In these two areas the concept of metabolism is linked with the sum of technologies and socio-economical processes that happen in a city, resulting in growth, energy production and residues disposal.

What determines the sustainability or not of a city will be the balance between what enters, accumulates or leaves the system in the form of residues from emissions and undesirable pollutants.

"When referring to urban water cycle metabolism we are thinking about the fluxes and conservation processes of all types of materials or energy used in the construction and operation of the system or subsystems" (Brattebo 2011).

The urban metabolism is essentially a mass balance in a larger scale and represents the inflow of mater, the usage/loss/transference of mater inside and the outflow.

The mass balance can be translated as:

—— Inflow: rain, superficial and subterranean drainage, water transference in the form of food or raw material

—— Food: converted in polluted residues with organic or inorganic compounds

—— Raw materials: converted in new buildings that may result in residues by demolition

Open linear metabolism

The open linear metabolism can be defined by: get, use, reject.

This metabolism requires greater quantity of entry resources opposed to a circular type, and because of this fact its ecological footprint is heavier. The pollution (outflow) is also bigger so the resources to its dilution or assimilation are also much bigger. The growth in energy demand, food and water, caused by an overpopulated planet and its necessities, results in even more pollution, abusive use of resources and its depletion, making this model unsustainable.

In the actual open linear urban water cycle, water capitation is made upstream, then distributed thru pipelines, used (and polluted), transported to a water treatment facility located downstream (far from where it could be reused), resulting in an overloaded stream.

To achieve a greater sustainability in urban water management the water system metabolism must be partially closed.
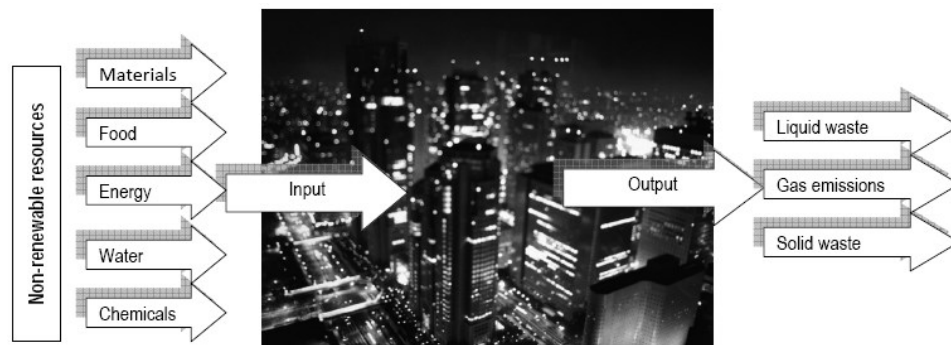
Figure 3 – Open linear metabolism

Circular urban metabolism

A better sustainability can be achieved transitioning from an open linear metabolism to a circular urban metabolism, where the principals of conservation, recovery and reuse of resources become the pattern.

In this new paradigm water management will comply with the following:

—   Water conservation;

—   Storm water management, implementing measures promoting the reduction of impermeable areas and the increase of superficial drainage. This will ease the consequences of flooding, while facilitating the reposition of sediments and improving water quality through the removal of nutrients and other chemicals before they enter the receiving environment;

—   Promotion of storm waters reutilization;

—   Changing current rules of territory planning so that the treatment infrastructures are located close to places where the water can be reused;

—   Changing urban water cycle planning rules, based in bigger centralized infrastructures;

—   Recovery and reutilization of water produced inside buildings for irrigation purposes;

—   Recovery of heat and energy through used waters and mud;

—   Organic management with the purpose of energy recovery;

—   Source separation;

—   Nutrients recovery.
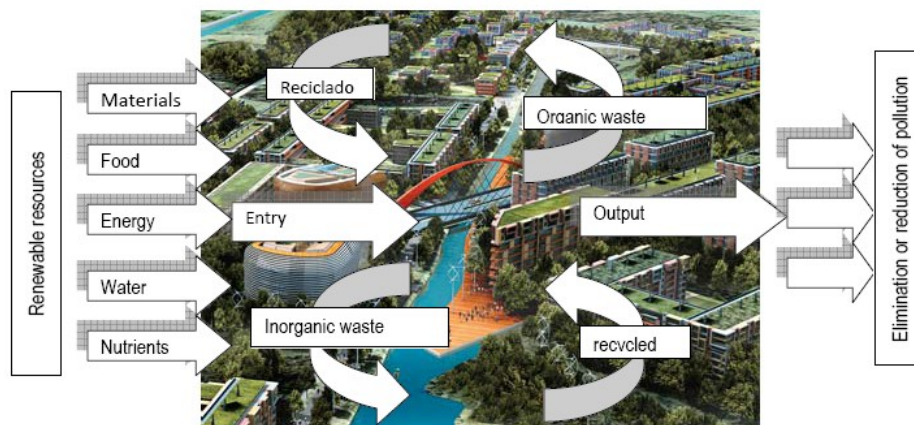
Figure 4 – Circular urban metabolism

Metabolism model applied to the urban water cycle systems

Transition to a sustainable urban water cycle system has to be strategically planned involving all stakeholders. Sustainable techniques have to be applied using the correct supporting tools. Solution analysis shall be made using the metabolism model tool.

The urban water cycle is made of systems that are needed to supply water for the various urban uses, ensure that residual waters are managed adequately and make sure rainwater are properly managed.

Resources, together with a set of activities and technologies upstream and downstream each subsystem, are essential in providing the functions that allow its operation. The aforementioned functions being arrange a service (or a component of a service), represent certain activities and technologies, lay out a resources, residues and emissions entrance and exit metabolism and find a way of representing risks.

A question arises on how to describe e model the relations between the aforementioned functions to evaluate the general quality of the system (Brattebo 2011).

The Metabolism Model (MM) may play a role as model of analysis. The objective is to examine and understand how to improve urban water

sustainability quality in a simple, transparent and effective way. Its usage can be made during short/medium term tactic planning, but focusing in a longer-term strategic management. It shall enable the analysis of the various subsystems in various levels of detail.

How to develop the qualitative and quantitative model

The global model can be simplified Brattebo (2011). The challenge is to define and examine the relations between different levels of the model (as represented in figure 6).

Firstly we will define some of its most important relationships observed from the metabolic and sustainability point of view. Secondly we will define the variables inside each relationship, assigning them a mathematically expression to use them in a model for testing validation and calibration.

Analytical methods than can be used in the metabolism model

Based in a case study in industrial ecology some analytical models can be used to develop the metabolism model (Brattebo 2011):

— Material Flow Analysis (MFA) used for the analysis of storage and flow of materials allowing its systematic evaluation inside a system, defined in time space. It's a tool that allows the evaluation of an existing system on food production, transportation and other human needs as it helps to plan more efficient new systems (Brunner 2004);

— Life Cycle Assessment (LCA) used in the analysis of environmental impacts associated with determined descriptors, promoting a phased systematic approach. ISO provides the rules for the elaboration of a LCA through the ISO 14040 and 14044;

— Life Cycle Costing (LCC), used to review the costs (similar to LCA) where the environmental impacts are calculated for the entire life cycle of a system. Cost cycle can be determined by LCC;

— Type-Age-Matrices (TAM) used to characterize the physical assets allowing comparing alterations with different investment, operation and maintenance costs;

— AWARE-P IAM used to analyze and visualize the entire system.

Urban water cycles are complex and integrated modulation as the MM includes numerous factors and mechanics. The integration of many models can turn it into a too complex system, making it difficult to use and interpret.

In the final phase of the analysis and visualization of the AWARE-P IAM system, using indicators from MM will result in the necessary information for the decision maker.

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RESEARCH, THEORIES AND PRACTICAL EXPERIENCE OF THERAPEUTIC LANDSCAPES AS A TOOL
FOR URBAN OPEN SPACE DESIGN

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This paper reviews the research on therapeutic landscapes and discusses the design of urban parks and open green space. Firstly, the most relevant research on therapeutic landscapes is reviewed. Secondly, the practical experience of healing and therapeutic gardens is discussed. Finally, the conclusions leading to future use of therapeutic landscape concept in urban open space design are presented.

The concept of therapeutic landscapes

The concept of „therapeutic landscape" was first introduced by Gesler (1992) to describe that people have traditionally sought healing power in certain locations. He wrote: „There is a long tradition that healing powers may be found in the physical environment, whether this entails materials such as: medicinal plants, the fresh air and pure water of the countryside, or magnificent scenery" (Gesler, 1992). Two cases researched by Gesler were Epidaurus in Greece (1993) and Lourdes in France - described as a place of pilgrimage and healing (1996). Other scientists agreed with Gensler's concept, that there are places that can improve psychological health and wellbeing – especially important for people living in urban environment – characterized by pollution, overcrowding and a stressful life.

Williams provided another definition of therapeutic landscapes, describing them as „those changing places, settings, situations, locales, and milieus that encompass both the physical and psychological environment associated with treatment or healing; they are reputed to have an enduring reputation for achieving physical, mental, and spiritual healing" (Williams, 1998) All scientists researching the concept of therapeutic landscapes agree that there are places on earth that are therapeutic to people.

The therapeutic gardens can be regarded as an attempt to create new man-made therapeutic landscapes. The therapeutic gardens are created to help the sick. However, the traditional distinction between healthy and ailing people is being reconsidered by the new definition of health.

The new definition of health

The new definition of health provided by WHO describes health as: „a state of complete physical, social and mental wellbeing and not merely the absence of disease or infirmity". This definition provides the new concept of well-being and sets ground for empowerment of people with different health problems. The concept of therapeutic landscape envisions creating a place for physiological, psychological and spiritual renewal, inclusively designed for all people. The life span of population is growing and the societies are generally getting older. The most common death causes of XIX century, contagious bacterial diseases were eliminated thanks to the achievements of modern medicine. Today, the mankind is facing other mortal threats, including cardiovascular diseases, diabetes and cancer. Without oversimplifying we can say that those diseases are provoked or aggravated by modern frantic lifestyle, stress, lack of physical activity and environmental pollution. The therapeutic qualities of nature can help to reduce the health risks of sedentary lifestyle and relieve the symptoms of many diseases.

Theories and research on therapeutic qualities of nature

Various researches proved the therapeutic qualities of nature. Following review presents the most relevant.

Healing properties of nature and citizens longevity

The presumption of healing properties of nature is as old as human history. Saint Hildegard of Bingen (1151-1158) in her work *Physica,* related to health and healing, listed nature and trees among healing agents. The tradition of

meditative gardens in monasteries dates back to early Romanesque period. Since the beginning of monastic tradition, monks have provided medical assistance in monasteries and medicinal plants have been planted in monastery gardens.

Picture 1: Meditative garden in Cistercian Cathedral, Oliwa, Poland

The tradition of Japanese and Chinese meditative gardens is very long and provides many interesting examples. Persian gardens, some of them created in ancient times are also beautiful examples of meditative gardens.

However, a centuries-old tradition of including nature in healing process was somehow forgotten in the age of sterile hospitals and antibiotics.

Therefore, it was a breakthrough discovery in 1984, when Roger Ulrich published his research on importance of contact with nature for human beings. He observed that surgery patients in a hospital, who were assigned to rooms with windows overlooking natural scene, had shorter postoperative hospital stay, received fewer negative evaluative comments in nurses' notes, and took fewer potent pain killers, compared to patients in similar rooms, but facing a brick wall. The importance of sun-light homes and trees was confirmed by Japanese study conducted by Takehito Takano (2002). They discovered, that seniors living on

tree-lined streets and within walking distance to grassy parks live longer than those with less exposure to greenery. The authors concluded: „the availability of space near own residence for taking a stroll is believed to increase the chances of walking outside of the residence, which helps to maintain a high physical status". The interesting question is why the living nature is so important for people.

Biophilia and Nature Deficit Disorder

To explain the bond between human and nature Edward Wilson developed a concept of Biophilia - the hypothesis of evolutionary psychology, stating that all humans share „innate tendency to focus on life and lifelike process". Biophilia explains the „instinctive bond between human beings and other living systems". The universality of our response to nature suggests that it is not purely a learned one, but rather an inborn genetic attitude. Savannah hypothesis explains human preference for grassy plains dotted with trees, woods, rivers and lakes. A group of Japanese scientist described the positive effects of "taking in the forest atmosphere or forest bathing".

They provided medical data on beneficial effects of walking inside the forest, observed among volunteers. Maas (2008) defined a concept of Vitamin G, where G stands for Green space – "necessary ingredient in healthy life". Trees and nature play an essential role in healthy human habitat. The definition of "Nature deficit disorder" was developed to stress the importance of time spend in natural environment. It was proved that less time spent by people (especially children) in natural environments (outdoors), results in behavioral problems: lack of ability to concentrate, shorter span of attention and self - discipline problems. We all share basic need to experience the wilderness of nature in order to restore our mental and physical forces.

Picture 2: Garden of Palace of the Marquis of Fronteira in Lisbon, Portugal

Human response

Rachel and Stephen Kaplan published the Attention Restoration Theory - (ART) explaining that focusing attention on a task for a larger span of time causes mental fatigue, while exposure to natural environments and wilderness benefits attention restoration, lifts people's mood and enhances ability to mentally focus. They listed four components of restorative settings:

— being away – away from usual mental content,

— extent – sufficient content and structure to occupy the mind for a period long enough to allow direct attention to rest,

— fascination – effortless attention, leaving little room to think about other things,

— compatibility – coherence between individual purposes and the kind of activities supported, encouraged, or demanded by setting.

The theory of Kaplans confirms the findings of Grahn and Stigssdotter (2002) who described "the pyramid of strength of mind", which illustrated how many demands people were able to absorb from their environment. How people

function in parks and gardens depends on their life situation. Therefore, the reception of restorative qualities of natural landscape relies on personal attitude towards nature. However, the therapeutic landscapes should cater for needs of all people.

Design guidelines based on theories

The important question for architects, landscape architects and urban planners is how to create green open space with restorative qualities. Grahn and Stigsdotter (2002) listed Eight Garden rooms characters: "Serene, Wild, Rich in Species, Space, The common, The pleasure garden, Festive, Culture". The restorative component correlate especially with: Serene, Space and Wild. Hartig (2003) observed that „moderate depth, moderate complexity, the presence of a focal point, gross structural qualities, and natural contents such as vegetation and water - can evoke positive emotions, sustain non-vigilant attention, restrict negative thoughts, and so aid a return of automic arousal to more moderate levels." Lis (2005) counted 13 basic groups of needs of park users, and mentioned the need to restore mental and physical forces as one of them. Spatial requirements to fulfil that need include: favourable microclimatic conditions, eliminated urban noise pollution, many species, sensory stimulation (visual, acoustic, olfactory, tactile) and environment with undisturbed natural conditions.

Picture 3: Park in Gdynia, Poland, located within walking distance to city centre

The research of Stigsdotter et al (2010) confirmed that size and shape matters. From the therapeutic point of view - the bigger the park the better. The more concise shapes are better than long and narrow.

Distance to green space is directly related to physical activity; therefore parks should be located within walking distance from housing estates. Respondents living closer than 300 meters to open green space are more likely to be physically active and less likely to be stressed than those living further away from parks. (Denmark study showed that 81,1% of all daily users of parks live within 300 meters) (Stigsdotter et al. 2010) Research in Gdańsk, Poland confirmed that majority of park users live within walking distance from the park.

All the theories and research presented above lead to the conclusion that there is a need, especially in countries with colder climate, to use the therapeutic qualities of nature, especially to counter the negative effects of modern stressful life conditions and to guarantee a better life quality for future generations. The therapeutic gardens in healthcare can serve as an example of practical use of the concept of therapeutic landscapes.

Practical experience of therapeutic gardens

The experience of therapeutic gardens demonstrates that "therapeutic landscapes" can be successfully implemented in healthcare settings. All researchers stress that a garden will never be an alternative drug or solution to all medical problems, but its influence can enhance healing processes that naturally occur within human body. It can stimulate and assist the natural healing process.

Definitions

Both the healing gardens and therapeutic gardens can be created in different locations. The following definitions provided by American Society of Landscape Architects (ASLA) in 2010 explain the difference between different kinds of gardens:

— HEALING GARDEN is a somehow vague term lacking precise design implications, but its purpose is to support generalized healing by helping patients become healthful, well and whole.

— MEDITATION GARDEN is likely to encourage inwardly focused attention for the purpose of deepening personal knowledge and attaining a peace with oneself.

— CONTEMPLATION GARDEN provides an ambiance conductive to examining issues beyond and/or larger than oneself in a thoughtful, deliberate, perhaps religious or mystical way.

— THERAPEUTIC GARDEN the term „therapeutic", however, suggests more than healing, meditation, or contemplation. The therapeutic garden may, and most likely should, include aspects that promote restoration, but it is more than any of these other garden types.

Picture 4: The therapeutic garden in Nursing Home in Nasielsk, Poland

Healing gardens

According to Sttigsdotter & Grahn (2002) there are different theories describing healing effects of gardens:

— the healing garden school states that the healing comes from the experience of garden, its design and context,

— the Horticultural Therapy school sees the activities in the garden as a core of therapy,

— the Instorative school finds therapeutic qualities in all: the experience of garden, the activities in the garden, and the visitor's background and character.

The last theory is also confirmed by Sterndberg (2010), who mentioned that the visitor's attitude towards nature and garden facilitates the healing and restorative process.

The healing gardens are constructed in various facilities e.g.: hospitals, nursery homes, hospices, war veterans' homes, cancer therapy centres,

Alzheimer therapy centres and other long term care units. They can be an invaluable asset in all healthcare facilities.

Healing gardens can be designed for different locations, e.g.: inside the building as interior garden with stable temperature and humidity, in dense metropolises - on the roof of building or as urban pocket gardens, and in open or suburban landscape.

Therapeutic gardens

Therapeutic garden is a special kind of healing garden, designed to assist treatment and healing of a particular medical condition. Therefore, it is crucial to carefully examine the particular condition to favour factors that can enhance healing and avoid unconscious triggering of problems leading to relapse. The positive influence of therapeutic gardens can be measured, mainly as a factor leading to shorter convalescence periods, limited use of pain-killing drugs and better self-proclaimed health of patients. The therapeutic gardens can promote healing in many ways, taking advantage of restorative qualities of nature, sensory stimulation, memory exercise, physiotherapy, kinesiotherapy, speech therapy, horticultural therapy and occupational therapy.

The therapeutic gardens were proven to help in many medical conditions e.g.: children's rehabilitation, therapy of blindness, orthopaedic rehabilitation, post-surgery rehabilitation, burn victims therapy, relieve of some symptoms of cancer, mental illness, Alzheimer disease, dementia, burn-out syndrome, addictions and other diseases. We are still in search of efficient medicinal treatment for many of those conditions. Both, the healing and therapeutic gardens demonstrate that the use of nature therapeutic qualities can be effective in treatment of different health problems.

Picture 5: The therapeutic garden in Nursing Home in Nasielsk, Poland

Conclusions – urban design, open space inclusively designed for all

The research reviewed in this paper confirms the importance of nature in human life. The assessment of both healing and therapeutic gardens proved that therapeutic landscapes can be created in virtually any given setting. The concept of therapeutic landscapes should be applied in the design of urban green areas. The urban population of growing metropolises is often lacking quality open green areas. Public space and parks should cater for the needs of diverse urban population. Open space fulfills a very important role for the entire society. The beneficial experience of a healing or therapeutic garden should be offered to everybody.

According to Marcus and Barnes (1998) the successful open public space must provide: Physical and mental restoration, Social contacts and Physical activities. Physical and mental restoration is achieved by contact with nature. In general, the term "public space", should mean a space where everybody feels safe and welcomed – a space for social contacts. Physical activities are promoted

by nature and open space available to all, even when the open space is lacking expensive sports equipment. The therapeutic qualities of nature: Serene, Space and Wild (Sttigsdotter and Grahn, 2002, and favourable microclimatic conditions (Lis, 2005) are the most important. The cities of tomorrow should offer access to therapeutic landscapes to every inhabitant. Even the green splinters can be turned into small therapeutic parks. The green public space should be designed to maximise the therapeutic qualities of nature, using the theory and research on therapeutic landscapes.

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DESIGN PROPOSALS

NEXUS

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Nexus is the *motto* for a solution that seeks to follow a pattern, relations and connections that are established between different elements of the landscape. By creating a vocabulary, and also a network that connects Monsanto Forest Park with Lisboa, the project aims to provide a clear understanding of this network. Looking at a larger scale it is possible to identify the Southern-Eastern green corridor, and two other possible green corridors, one that goes along the North towards the Tejo estuary, and a third one that goes along Algés Riverside, facing South-West. The first connection is seen as a good example and a well succeeded relation, it was replicated as the best answer to establish the connections from Monsanto to Lisboa.

These connections would link the green corridors to a ring road – already present but not materialized - that connects all of the activities existing in north

Monsanto. These connections would be created by soft mobility structures more associated with the urban way of living: the Alcântara aqueduct, the archetype once that besides transporting water, it also allows for pedestrians or even cyclists, to cross the Alcântara valley from Campolide to Serafina neighborhood.

This structure already constructs the vocabulary that is sought for – in a procedural and in a material way. The aqueduct, as a partially invisible structure, represents a landscape landmark when it crosses the valley, and a city landscape, whether inserted in the city's urban tissue whether in those cases where the urban tissue fits to it which is the case of the Boavista neighborhood at West, and the Serafina neighborhood at East.

When the transition to the city does not meet the housing pattern, associated with the aqueduct infrastructure, it meets other type of infrastructures, mainly heavy mobility infrastructures, as the main roads that run across the city, and the railway to Sintra, Alcântara and North/South. These ones, instead of making a permeable and human transition, they materialize a wall, closing the park in itself.

At the beginning of the forest on the top of the park and at the ring road, passing through their intersecting points, and in the end of the aqueducts, small damns are built as landmarks and checkpoints.

From splinters to parks
2nd [Urban + Landscape] design international workshop
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NEXUS PROJECT
Water management
as a landscape
structuring element.

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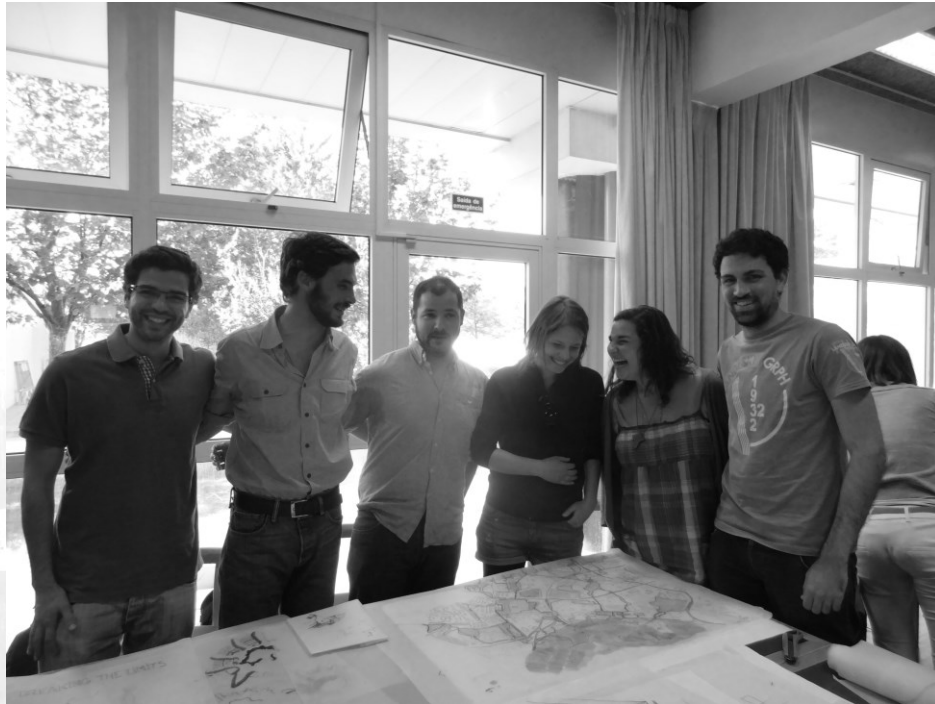
The Monsanto Forest Park has been an important green area of the city since the 1940's and it is usually known as the "Green Lung" of the city of Lisbon.

However the main problem of Monsanto Park is not what is happening inside it, but the lack of connections with the urban fabric in its surroundings. In order to improve a better communication in-between borders, this proposal focus on creating connections – Bio – Synapses – and making them accessible to everyone who wants to enjoy the Park.

In the human brain there are different synapses – some are fast and some are slow – and metaphorically we want to express this idea by creating two kinds of synapses – a fast one and a slow one –offering a dual movement that provides different ways of connecting with the park and different ways of experience it.

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BREAKING THE LIMITS

PROPOSAL - 1:5000   CONCEPT
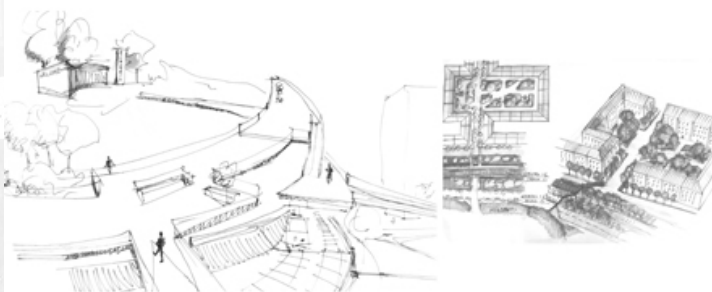
The natural park of Monsanto in Lisbon creates a very big impact in the organization of the city. However the connection between the urban and the park on the north side (Benfica) is very difficult because of the natural physiognomy of the terrain and the big infrastructures (linha férrea e a radial de Benfica). The major idea is to overcome the barrier, where the area of Monsanto and the urban can exchange dynamics. It's like Monsanto is contaminating the built area, connecting directly to the most important green-spaces in the area and generating new pathways of green that resolves the lack of connection in the urban spaces ("the splinters").

The solution to pass this barrier was to create some kind of platform's creating new spaces in this in-between moment, where the continuity of the green start's to spread out of the park. The platforms could have not only the objective to make a connection but also they can be seen as points of incentive where there could be spaces for leisure and small services that inform and guide people in Monsanto. These services would have maps and indications of main courses (and event's) happening in this green area. Also there could be some kind of new mobility that incentives people to explore this space.

In general what we have to say is "Break the Limit's"
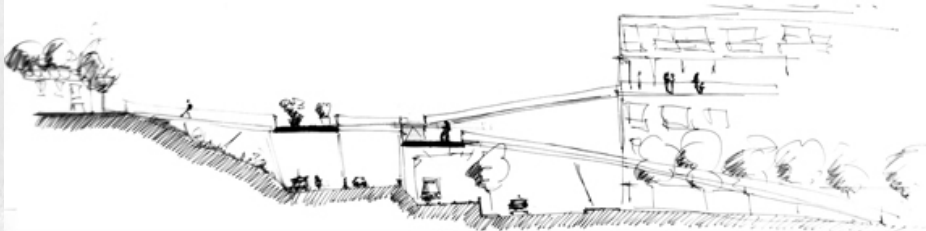
GUT - FA : EWA PIETRZAK   FA-UTL : ANDRE FERREIRA | FRANCISCO CAMPOS | JOAQUIM QUINTELA | MATILDE AMARAL | RUI FELICIO

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ISOCARP
Knowledge for better Cities

Connecting Benfica

by André Ferreira

In the context of Lisbon, S. Domingos de Benfica gives a feeling of a big dorm place where the services are disconnected and the urban space and the public areas do not have enough complexity or interest to allure people. The heavy infrastructures, like roads, have a harsh impact, where great mobility for individual public transportation is a fact.

Therefore one can say that this is a mere place to pass through. Incentives to cultural events and urban facilities are few. However, this is a place of high historical value, with interesting heritage, which has a possibility to tell its story for itself, should an approach would decide to develop it. The route that comes all along the Aqueduct "Águas Lives", connecting to Monsanto Park, going through Estrada de Benfica to the Market of Benfica, creates a unique way to see this area with a sense of direction and provides the ability to understand the fabrics' evolution in its different moments and identities.

The pathway has the objective to not only make a connection between spaces, but also to incentivise the creation of new events, showcasing the architectural heritage to the city, creating conditions for a better use for the people that live there and consequently rise the offer in some points for the local economy (small trade points that have now the capacity to create a business with this new identity).

The pathway, as an organisational structure, brings forward a new identity, already embedded in the urban space to guide us across different places. The project builds up a connection that reveals a story and encourages the development of more interesting bonds between people and the urban space.

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CONNECTING BENFICA

Lisboa-Benfica

by Francisco Campos, FAUTL

The proposal was developed in order to establish a better territorial integration between Benfica and the wider city. The proposal aims at creating new routes linking the major public facilities, services, points of reference and derelict plots, fading out in urban parks and along the boundaries.

Moreover, this route is intended to create a better connection between the existing green spaces and the recreational and leisure areas which were designed, reflecting thus an improvement in social life and providing better quality and more advantages in the land uses. The solution for qualifying the old Simões' factory in Benfica consists on a school of Traditional Crafts, with the aim of assigning a new function and potential for this property.

It aims to develop a training school specialized in the recovery of some traditional activities and crafts that are falling into disuse. Conceptually, the School of Traditional Crafts will be a versatile structure, where you can learn a range of traditional crafts which gradually lost expression over the years such as: crafts, work in carving, crafts, among others.

The estate will have an open strand and curiosity, sharing an informal atmosphere and a strong practical focus on traditional and innovative methods. This recovery also includes a public library, exhibition areas, working studios, new living and leisure areas.

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From inside out

by Joaquim Quintela, FAUTL

Looking to Benfica e São Domingos de Benfica it was easy to distinguish two main axes, Estrada de Benfica and Uruguay Avenue.

However, these axes have few connections to inner spaces captured inside the blocks, where interior spaces, despite adjacent to the axes, hold different paces and bring about new experience.

Therefore, the proposal aims to promoting a a new dynamic within these interior spaces, so that people feel invited to roam along the streets to discover, step by step, a new public realm made of living places equipped with support elements or inviting elements, like exhibition halls or workrooms.

These elements are designed as a way to provide work spaces for the newly population, a population that is searching for a job, being the target audience the new architects, giving them a way to explore all its artistic forms.

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FROM INSIDE OUT

PROPOSAL

FACULDADE DE ARQUITECTURA DE LISBOA | UTL

JOAQUIM PEDRO QUINTELA

The city as a therapeutic space

by Matilde Amaral

The main idea was to turn the area of S. Domingos de Benfica greener in order to guide the population and tourists to the Heritage present in this area of the city, like Monsanto, Marquês da Fronteira Palace; requalificate the squares and give new uses to the empty spaces, always with the idea of creating spaces that are directly or indirectly therapeutic, for example, streets with specific species of trees, squares with green spaces where we can see and smell relaxing flowers, designed accordingly.

As this area of the city has many schools and two important hospitals, the design of a space to link them, mainly the two hospitals which are very close to each other, emerged as a need. For that therapeutic garden was created adjacent to the Red Cross Hospital.

The garden will provide for Horticulture plots, Gardening areas, Relaxing Places, where people can be in touch with water and flowers. Following the main idea of guiding people towards heritage, the streets and squares near the garden will abide by the same type of intervention. For instance, instead of *Calçada*, a traditional pavement made of stone cobles, a green pavement will be fully designed.

One of the main concerns was that the garden would be used by all kind of people. Therefore, design is inclusive and adjusted to old people, children and people with reduced mobility.

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THE CITY AS A THERAPEUTIC SPACE

PROPOSAL - 1:2000

CONCEPT

PLANT AND SECTION - 1:500

REFERENCES AND PERSPECTIVES

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ISOCARP
Knowledge for better Cities

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Monsanto Forest Park is a protected forest in Lisbon, Portugal, the largest green patch in the city. It offers a diversified flora and fauna, great panoramic views of the city and the Tagus River and many different spaces for leisure and sports which gives visitors the opportunity to delight in practicing all sorts of outdoor activities.

Our work aims at developing a sensorial network that diverts people from their daily activities and pulls their attention from all the common and quotidian experiences. This network connects an interface between the Colombo, one of the largest malls in the Iberian Peninsula, with Monsanto, by crossing the old royal road of Benfica. The purpose of this network is to allow a connection between the city (in this case the north part of Monsanto - Benfica and S. Domingos de Benfica) not only visually but also physically, trough

sensations that impel us towards the park and the rehabilitated bridges that allow the users to get into it. Through this network and all the five senses (sight, smell, taste, hearing and touch) people are gently invited to enjoy a break, and free themselves from the stress of living in a large city.

This connection is made by different materials and textures (from rough to smooth, furry to spiky) with appealing colors, by the sound of water, birds and the rustle of leaves, by aromatic plants and by several infrastructures spread throughout the path like coffee shops, flea markets or flower shops. Monsanto, the lung of the city is thus discovered by the senses allowing an escape from the stresses and strains of everyday life.

Sensing the city

by Alexandra Anton

Looking back in history (way back) we see that people have always fought against nature – by hiding in caves to survive the terrifying weather, by creating guns to protect from frightening creatures, by building walls to protect from danger. This intrinsic fear of the environment, of the unknown perpetuated itself in the way the cities are developed. Another important element to mention is the development towards faster, shorter ways to solving our problems.

Now we have multiple ways to connect and communicate: different means of transportation, mobile devices, email and social networks. Nowadays, the focus is centred on the goal, time spent getting to the destination is seen as lost time. We try so hard to make it shorter and fill it with activities like checking our phone, sending a message, calling someone. We neglect the space surrounding us, be it streets, buildings, nature. This partially neglecting attitude was illustrated well by Ernest Hemingway - 'It is good to have an end to journey toward; but it is the journey that matters, in the end.' How would people fill if they would be all of the sudden in the middle of Monsanto with no piece of technology? Would they feel frightened, lost, bored?

In order to restore the link between Monsanto and Lisbon, it is essential that people develop the sense of space. The core concept of the project is represented by the dandelion flower, and the way the wind spreads its seeds. Similarly, Monsanto is present not only in Monsanto, but one can sense it all over Benfica. Across the railway, in the residential area, there are a number of urban squares that present a tremendous potential. Each of these spaces shall be personalized through different senses: visual, smell, sound. This results in a different type of urban square, for example: aromatic garden, urban coffee farm, therapeutic garden, tea garden. All of these squares will have a different characteristic, but joined together they will create a unitary system.

From splinters to parks
2nd [Urban + Landscape] design international workshop
Lisbon, 7-10 May 2013 | Faculty of Architecture, Technical University of Lisbon

SENSING THE CITY - discovering Monsanto

author: Florentina - Alexandra Acrion

Looking back in history (way back) we see that people have always fought against nature – by hiding in caves to survive the terrifying weather, by creating guns to protect from frightening creatures, by building walls to protect from danger. This intrinsic fear of the environment, of the unknown perpetuated itself in the way the cities are developed.

Another important element to mention is the development towards faster, shorter ways to solve our problems. Now we have multiple ways to connect and communicate: different means of transportation, mobile devices, email and social networks.

Nowadays, the focus is centered on the goal, time spent getting to the destination is seen as lost time. We try so hard to make it shorter and fill it with activities like checking our phone, sending a message, calling someone. We neglect the space surrounding us, be it streets, buildings, nature. This partially neglecting attitude was illustrated well by Ernest Hemingway - "It is good to have an end to journey toward, but it is the journey that matters, in the end." Now would people fill if they would be all of the sudden in the middle of Monsanto with no piece of technology? Would they feel frightened, lost, bored? In order to restore the link between Monsanto and Lisbon, it is essential that people develop the sense of space.

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One of the more in urban square is designed as an urban coffee farm. This square is defined by an open air coffee house, chocolate and candy shops situated at the ground level of the buildings and by the vegetation that relates to the proposed architecture programs – coffee and cacao trees. This mixture of urban and natural elements contributes towards a more friendly and inviting space, attracting people towards rediscovering nature.

Plan scale 1:5000

Plan scale 1:1000

Team   Ana Maria Miranda, FAUTL
Francisco Gomes Marques, FAUTL
Gonçalo Carvalho, FAUTL
Karim Benali, FAUTL
Luís Miguel Jerónimo, ISAUTL
Magda Derdzikowska, GUT

The Monsanto Park has been an important green area of the city since the 1940's and it is usually known as the "Green Lung" of the city of Lisbon.

But the main problem of Monsanto Park it's not what's happening there, but the lack of connections with the urban fabric that surrounds it. In order to achieve that, this proposal focus on creating connections – Bio – Synapses – and making them accessible to everyone who wants to enjoy the park.

In the human brain there are different synapses – some are fast and some are slow – and metaphorically we want to express this idea by creating two kinds of synapses – a fast one and a slow one –offering a dual movement that provides different ways of connecting with the park and different ways of experience it.

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BIO - SYNAPSES

The Monsanto Park has been an important green area of the city since the 1940's (the time when started the forestation of Monsanto Mountain that gave birth to the park) and nowadays its usually known as the "Green Lung" of the city of Lisbon.

In the park there are many different spaces (ex.: urban parks, amphitheatre, sports centre) that offer a broader range of activities (ex.: sports activities, open air concerts, open air theatre, bird watching) and also cultural heritage sites such as the Aqueduct of Lisbon or the Fronteira Palace. So the main problem of Monsanto Park it's not what's happening there, but the lack of connections with the urban fabric that surrounds it.

In order to achieve that, this proposal focus on creating connections – Bio – Synapses – and making them accessible to everyone who wants to enjoy the park. In the human brain there are different synapses – some are fast and some are slow – and metaphorically we want to express this idea by creating two kinds of synapses – a fast one and a slow one –offering a dual movement that provides different ways of connecting with the park and different ways of experience it.

This proposal focus more on the north area of the park but the idea is to adopt this strategy in the other areas of the park, establishing connections not only with the city of Lisbon but also with the urban fabric of the Municipalities of Oeiras and Amadora that also surrounds the park. Monsanto Park shouldn't be seen only as an important green area of the Municipality of Lisbon but also in a broader context – the Metropolitan Area of Lisbon.

01. Program

02. Layering

Need For Connections → **Dual Synapses**

The Fast Synapses consists in a system of Cable Cars that connects "Trail of the Aqueduct" and the Welcoming Centre with the Subway System and the Metropolitan Railway System, creating an easy and fast access to everyone who wants to go the Monsanto Park.

The Slow Synapses consists in a network of green corridors that connects all the important open spaces and landmarks with the "Trail of the aqueduct" and the Welcoming Centre. Only one of the green corridors already exists – connecting the city centre with the Monsanto Park – consists in succession of different parks. In order to create the rest of the green corridors, it is needed the rehabilitation of the open spaces, keeping some already existing functions and adding others, giving them a multifunction taking into account also the landmarks that exists in the proximity and the people that use them.

Fast Synapses – A system of Cable Cars that connects directly the Monsanto Park with the Subway System and Metropolitan Railway System.

Slow Synapses – A system of green corridors that connects the different open spaces and landmarks with the "trail of the aqueduct" and with welcoming centre.

03. Simulations and "Photocollages"

As previously stated, the goal for this proposal is to create connections between the urban fabric and Monsanto Park, through a network of public spaces and cable cars, that can be flexible and adaptable at the same time. It must support a broader range of functions, such as open air events (3) or sports activities (4), and also enable functions like urban agriculture (2 and 3), that can be an economic help to the lower classes, not only for self consumer but also to sell the farm products in the market. Two different synapses, offering two different possibilities of experience the Monsanto Park and the rest of the public spaces (1 and 4), making this connections easily accessible to everyone.

City's dichotomy

by Ana Maria Miranda

From this viewpoint, one of the most important city's dichotomy manifests in the clash between the urban fabrics and the major road infrastructures upon them. Two dimensions are to be considered: above, where vehicles travel, and below, re-qualifying public space and giving it a new character.

The idea is thus to work with the negative aspects of these infrastructures and to use them positively on the interest of population. Noise is sought of to be one of the most important ones. As the vehicles circulate on the roads they produce noise that, through existing technology, although not widely used, may be turned into clean electric power. The energy harvesting system is installed in the Road Divider, in this case, the *Segunda Circular.* This system is metal flexible made, which balances with the vibrations resulting from stumbling over of vehicles (sound waves). This structure is composed by sensors, whose function is to convert sound waves' motion into kinetic energy. This energy is conducted to the low/medium voltage plant proposed, and then transformed into electrical power that is immediately distributed to feed the city.

The other dimension of the project is the Architectural one, developed around the area where the electric plant is proposed. The goal is to reskill the public space, knowing that one underground parking is proposed for that area, this takes up space at the surface which was previously used for parking, freeing the same space to the creation of spaces for leisure enjoyment of the resident population. That public space includes a dissemination centre to increase the acceptance of the project and to re-educate the population ecological habits.

The conceptual aim of the proposal is not only the introduction and dissemination of a new clean energy source, but an attempt of a gradual substitution of fossil energy sources to clean ones, integrating them in the city and in the lives of people.

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EᴄᴏᴄTᴏᴘᴏs

Team   Inês Carvalho, FAUTL

Joana Couto, FAUTL

Kacper Skawinski, GUT

Mafalda Matos, FAUTL

Ricardo Cruz, FAUTL

What future can be expected to Benfica's urban green spaces? As a background, the design aims at developing a proposal to integrate and empower the green and void spaces at Benfica. Taking into account the various specificities of the site, from the climate to the possibilities offered by th diversity of space appropriation, the proposal envisages a "green network".

By this, and following the pivotal idea by Ribeiro Telles to the *green corridor*, a new network of green spaces would appear together, in a first stage, next to the railway station of Benfica, between Monsanto and Campo Grande. Although quite expensive, the development of a multifunctional "ecoMdevice" (light, leaves and water collector that would also work as urban furniture) would allow for economic sustainability.

From splinters to parks

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LISBON

DESIGNING AREA
1:25000

Benfica

TAGUS RIVER

What future for Benfica's urban green spaces?

ECOCTOPOS
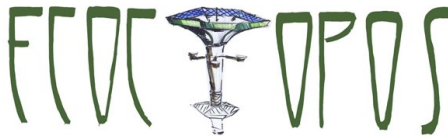
Inês Carvalho | Joana Couto | Kacper Skawinski | Mafalda Matos | Ricardo Cruz

Monsanto

Esc: 1:10000 N

Green Network Proposed

Transportation:
—— GroundLevel Higway
- - - Upper Level Road
·-·-· Underground Level Higway
······ Rail Road

Metro Station
Transport Interface

Designed Areas:
1 - Monsanto Conection
2 - Train Station Square
3 - Sta. Cruz Green Space
4 - Green Factory
5 - Quinta da Granja
6 - Granja Bridge
7 - Lusíada Green Promenade
8 - Music Park

Background/Motivation

This work, produced as a result of participation in the workshop "From Splinters to Parks", aims at a proposal for integration and empowerment of green spaces and urban voids in Benfica.

Methods/Approach

Taking into account the various specificities of the studied site, from the climate to the possibilities of space appropriation, it was developed a proposal for a "green network" that aims (like the Green corridor created by landscape architect Gonçalo Ribeiro Telles) to enable a new "chain" of green spaces together in a first stage, starting next to the railway station of Benfica, between Monsanto and Campo Grande.
The proposal, being quite expensive in terms of maintenance, would become feasible with the development of a multi-functional "eco-device" (light, leaves and water collector, and it would also work as urban furniture: lighting and seating). This device would enable a more economical maintenance of new proposed spaces and consequently its creation.

Results

The development of this proposal has shown its viability, from the point of view of its physical implementation possibility, since many spaces were found in this urban net (particularly urban voids and abandoned spaces) which allow the aforementioned "green" network's creation.

THE WSC COLLECTOR
WATER SUN COMPOST

VARIATIONS

LOCATION IN THE STREET

LIGHT/SHADE

References

Project: Eco-Transitional Urbanism, Location: Taiwan, China

Project:High Line, Location: New York

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UNIVERSIDADE TÉCNICA DE LISBOA

CIAUD

FCT Fundação para a Ciência e a Tecnologia

dgTerritório

Câmara Municipal Lisboa
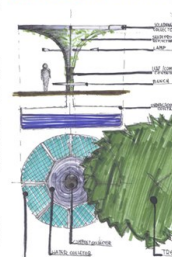
ISOCARP
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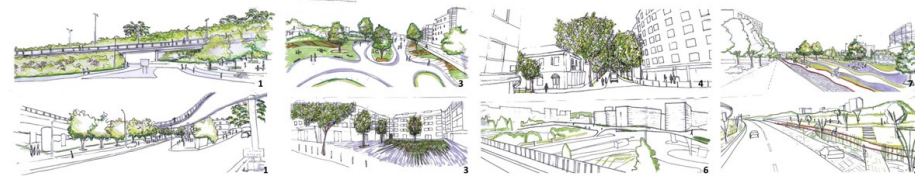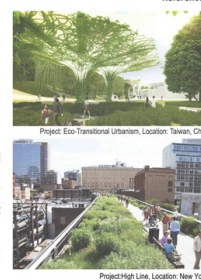
Join, transform and qualify

by Inês Carvalho

The project started with a large scale group analysis of Lisbon. That analysis allowed to noticing topics, which contribute to a blockage of sustainable development in the area. In this area there is a strong presence of large infrastructures, road and rail, which despite helping the development act mainly as barriers and create "urban islands" that do not articulate with each other. These infrastructures are also promoters of discontinuities in the pedestrian network affecting the quality of the public space, making it confusing and disqualified. Having the public space as an element of structure of the urban fabric, not merely residues, a strategy of legibility of the public space was approached. Thus, a network of public spaces of reference that invite people to stay longer periods of time was created. The analysis at a higher level allowed realizing that there are two areas of the city physically close but distant in their daily life: Benfica and the first university campus in Lisbon. The idea was to bring together these two important parts of the city through the creation of qualified system of public space, each of which with its own identity. At a closer look and with the aim of providing an identity to each space, an empty terrain with great potential seemed too important not to be worked; therefore. This plot is near the museum of Music, which is little known by the public, as it is located inside the subway station. So the proposal is to create a garden that helps to promote the existent museum and support the people that this area does not have a space of this nature. The new garden will incorporate the park Bensaúde, and beyond the extent of the museum, will have an exterior auditorium, an exterior area for musical instruments exhibition, a playground, an improved picnic area and several free areas. Besides creating a new park, the rehabilitation of vacant buildings to support existing activities, such as workshops, activities for children, reading room, is very important. The old chicken farm was transformed into a biological market, where users of the existing urban gardens in the park may sell their products.

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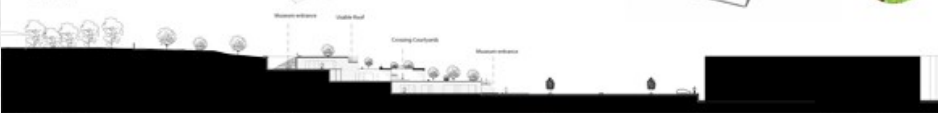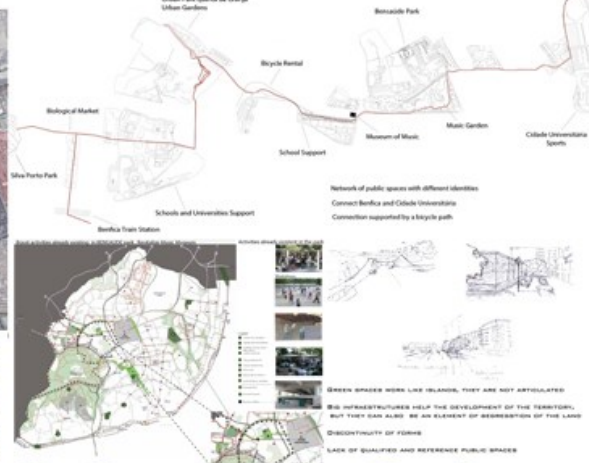
An element for aggregation

by Joana Couto

The municipality of Lisbon is an area with a strong historical originally formed by small urban areas, has undergone major changes in recent decades as the city expanded, today it is a territory secreted by scattered and fragmented urban fabric.

The proposed project is the elaboration of a plan of urban restructuring for greater territorial integration that focuses on the area Benfica intending to develop a strategy of urban intervention can enhance the territory giving effective alternatives having intended to meet the urban area intervention.

Place of opportunity for the development of an urban structure with the potential integration and coordination, the overall proposal emerged from a pedestrian path that connects the main air areas, community facilities and services reference points spaces Expectant a structure ecological continues complemented by a pedestrian and cycling network structured.

However, this course aims to create a greater correlation between unskilled green spaces, recreational areas and pre-existences, thereby improving the social life and provide a better quality and a better use of territorial features.

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Benfica – population and urban regeneration

Mafalda Matos

Taking into account the various specificities of the studied site, such as demography (a predominantly elderly population), local economies (predominance of traditional commerce, which tends to disappear), and also the ease of accesses (in public or private transports), it was developed a proposal for a better pedestrian network (occupying urban voids).

This network, combined with the rehabilitation of a former factory's unoccupied building (that would be transformed into a library, exhibition centre and cafeteria), aims to promote a change in Benfica's pedestrian and economic flows.

The development of this proposal has shown its viability since many spaces were found in this urban net (particularly urban voids and abandoned spaces) which allowed for the aforementioned regeneration network's creation.

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Abstract

Benfica's population and urban regeneration.

Background/Motivation

This work, produced to the Laboratório de Projecto class, aims at a proposal for Benfica's population and urban regeneration and empowerment.

Methods/Approach

Taking into account the various specificities of the studied site, such as demography (a predominantly elderly population), local economies (predominance of traditional commerce, which tends to disappear), and also the ease of accesses (in public or private transports), it was developed a proposal for a better pedestrian network (occupying urban voids).

This network, combined with the rehabilitation of a former factory's unoccupied building (that would be transformed into a library, exhibition center and cafeteria), aims to promote a change in Benfica's pedestrian and economic flows.

Benfica | Population and Urban Regeneration
Mafalda Matos | Faculty of Architecture Technical University of Lisbon

Transports and Demography
Analysis
Benfica District

Label
- Transports Stops
- Roads Network
- Benfica's Cycling Network
- Transports Influence Area
- Buildings

Number of residents (over 65 years)
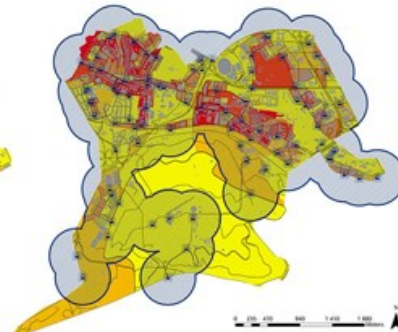
Label
- Existing Path
- Suggested Path
- Urban Agriculture
- Green Areas

A — Expansion of Existing Urban Agricultural Areas

B — Proposal for Urban Space Reformulation
(Squares on República Peruana street,
Doutor Teixeira de Aragão Square and Benfica street)

C — Requalification and Rehabilitation Proposal: Simões
Factory Buildings/Lot and Contiguous Lots

D — Rearrangement Proposal: Public Transports Stations

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THE EXHIBITION POSTERS

From Splinters to Parks was first exhibited at the 49th ISOCARP congress, in Brisbane, 1-4 October 2013. The workshop results were presented in new Royal International Convention Centre in Brisbane (www.ricc.com.au).

A presentation was made under the scope of the Planning Education Forum, session Lifelong learning.

BREAKING LIMITS

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SENSING THE CITY ...

Alexandra Anton, FAUL (Erasmus)
Carlota Oliveira, FAUL
Eduardo Campelo, FAUL
João Santos, FAUL
Manuel Vicente, FAUL

SENSING THE CITY

BIO - SYNAPSES

Ana Maria Miranda, FAUL
Francisco Gomes Marques, FAUL
Gonçalo Carvalho, FAUL
Karim Benali, FAUL
Luis Miguel Jerónimo, ISAUL
Magda Derdzikowska, GUT

BIO SYNAPSES

Alexandra Anton, FAUL (Erasmus)

Sensing the city

Ana Maria Miranda, FAUL

City's dichotomy