SIXTH FRAMEWORK PROGRAMME

PLUREL

Book of Abstracts

Managing the Urban Rural Interface

19-22 October, 2010

Frederiksberg Campus, University of Copenhagen

International Conference

PLUREL

Managing the Urban Rural Interface: Strategies and Tools for Urban Development and Sustainable Peri-Urban Land Use Relationships

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Frederiksberg, Denmark

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Topic 7: Locally adapted strategies for rural-urban regions: from understanding of issues to finding of solutions
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Topic 8: Sustainable multifunctional landscapes in peri-urban areas
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Topic 11: Sustainable Urban Development in Emerging Economies
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Table of contents

Keynote speakers

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[2]Professor, University of West of England, Academic Partner of URBAN MATRIX

URBAN MATRIX: Knowledge Transfer among European Cities in addressing Sustainable Urban Development

URBAN MATRIX was a FP6 funded project that successfully set up a knowledge transfer platform to support European cities in learning about projects and policies related to Sustainable Urban Development (SUD).
This project was coordinated by EUROCITIES, the network of more than 140 major cities in Europe. The consortium included the Cities Research Centre at the University of the West of England, GHK Consulting as well as nine European cities as key partners: Amsterdam, Helsinki, Seville, Malmo, Belfast, San Sebastian, Palermo, Stockholm and Sheffield.

The Problem

Local governments play an important role in implementing sustainable urban development policies. Ideally, decision-makers in city authorities should be fully aware of the latest research findings, the range of available solutions, and current legislation and best practices on this field; however, this information is not always accessible or disseminated in a timely and appropriate format. Therefore, there is a need for cross-checking the supply of information and the demand for solutions on Sustainable Urban Development (SUD) policies and practices, so city practitioners can benefit from this "knowledge and know how" and contribute to a greater urban sustainability.

The Project objectives

The overall objectives of the project were to:

- chart cities demands for knowledge on urban sustainability issues;
- organize the supply of existing information available (research results and best practice);
- develop a methodology to match supply and demand – through an interactive website portal and knowledge exchange events;
- evaluate this project methodology and make recommendations to the European Commission on effective means for exploiting and communicating existing knowledge and expertise.

The Methodology

Through three annual surveys (2007, 2008, 2009), URBAN MATRIX built up a picture of the knowledge demand of European cities on SUD issues and the obstacles they encountered in accessing knowledge relevant to their needs. Based on these results, the project organised a collection of tested practices and research outcomes. The knowledge so gathered is publicly available in the URBAN MATRIX e-library which is linked to the wider European Urban Knowledge Network (EUKN) and available at www.urban-matrix.net. In addition, thematic workshops were held each year, offering transferable examples of best practice and facilitating mutual learning between city practitioners and researchers.

The Results

Even though the number of partner cities is limited, the project provides benefits to a wider group of local authorities who took part in the project activities. The surveys and direct encounters with city administrations through the workshops allowed us to improve the dissemination of knowledge on SUD. Through the surveys we were able to identify a 'knowledge dissemination deficit' that needed to be addressed at all levels from the European to the local.

Through the production of recommendations on how to improve dissemination of future research results, the project has influenced EU urban policy and how it is implemented in cities. The URBAN MATRIX Recommendations provide a number of proposals to the European Commission on the design of future EU research funding for Sustainable Urban Development that responds to the current knowledge needs of cities, supports successful tools for knowledge exchange and transfer and increases the profile of the urban agenda in the EU's research funding programmes.

Bob Evans
Professor
Northumbria University

Urbanity, Rurality, Governance and Resilience

In both public policy and academic writing it has become commonplace to refer to 'urban sustainability' or to the more vague and aspirational concept of 'the sustainable city'. This latter notion is particularly fraught with difficulty since, as has been regularly argued, the concept of the sustainable city is an oxymoron. Cities are consumers of people, resources, energy and raw materials – they need these to survive - and although town and city governments can strive to adopt more ecological and carbon neutral policies and sustainable lifestyles for their citizens, it is doubtful whether any city can truly claim the title 'sustainable', since there will always a reliance upon some kind of 'hinterland', near or distant.

This paper will explore the concept of the sustainable city within the context of its 'territory' – as opposed to its 'hinterland'. The sustainability agenda requires new ways of thinking about the urban-rural relationship and the policy and political changes that this will require The paper will argue that it is no longer helpful to view our collective futures through the lens of the polarized concepts of rural and urban. Moreover, it will be argued, if our increasingly urban European society is to develop the resilience and associated transition strategies to meet unpredictable, non-linear and possibly rapid social, economic and environmental change then the wider issues of governmental structure, governance and citizen engagement become even more important.

Birgit Georgi
Project Manager - Urban issues
European Environment Agency

The Challenges of sustainable Urban Development in Europe and its Consequences for Rural-Urban Relationships

Europe is a highly urbanised continent with a long tradition of cities. Currently, around 75% of the European population live in cities and this percentage is expected to further increase. Hence, although covering just around 4% of Europe's surface, cities' influence goes far beyond their borders deep into the rural hinterland.

Meanwhile overall land use changes in Europe slowed down over the last years, the rate of urban growth further increased in the period between 2000 and 2006 compared to the nineties. In contrast to the nineties, the growth of residential areas seemed to have slowed down but the extension rate of commercial and construction sites has accelerated. In particular, that type of sprawl happens not only around cities but reaches far into the rural hinterland, preferable in proximity to major transport infrastructure. As these are the trends for Europe as a whole, big differences can exist between the countries and regions. For instance between 2000 and 2006, the rate of urban growth varied between close to 0 and 5% per year; in some countries, housing was the main driver, meanwhile in others it was rather industry and construction.

Artificial land up take happened mostly on agricultural land which in turn put further pressure on natural and semi-natural areas. Together with the further fragmentation of rural areas this feeds land use conflicts. Less area becomes available for the production of food and biofuels, for nature and biodiversity, and the delivery of important ecosystem services for the urban and the rural population.

On European average, the urban area increased faster than the population led to a decrease in population density. This reduces the resource efficiency potential of urban areas in terms of transport demand, land and energy consumption and increases the ecological footprint of cities. Urban sprawl far into the hinterland blurs increasingly the differences between urban and rural, created substantial low dense and scattered peri-urban space und spread urban impacts in rural areas even more.

Further urbanisation in Europe posses not only threats to the environment, but offers also a potential for a more sustainable Europe. The challenge is to find a balanced concept by promoting urban density to improve resource efficiency but create nevertheless attractive cities with high quality public and green space. In fact, it seems that a number of cities become attractive again, letting assume that they provide a good quality of life. In nearly a third of bigger city regions the population grew faster or shrunk less than in the hinterland. Cities can become more efficient and attractive and contribute thus to a reduction of urban sprawl; however, they can never be completely self-sustaining. A balanced concept includes a strong co-operation with the rural hinterland and its services – a hinterland that can reach as far as Asia or South-America producing food and other goods consumed in European cities.

Further information:
EEA land use: http://www.eea.europa.eu/themes/landuse
EEA urban environment: http://www.eea.europa.eu/themes/urban
IUME Working platform (Integrated Urban Monitoring in Europe):
http://iume.ew.eea.europa.eu/

June Graham
Project Co-ordinator of URBAN ERANET
Scotland & Northern Ireland Forum for Environmental Research

Increased Coordination of Urban Sustainability Research in Europe

Sustainable urban development - the focus of URBAN-NET

URBAN-NET is an EC Framework Programme 6 European Research Area Network (ERA-Net). ERA-Nets provide a framework for ministries and research councils implementing public research programmes to coordinate their activities e.g. by developing joint activities or by mutually supporting joint calls for transnational proposals. URBAN-NET comprises national and regional research managers, funders and facilitators from 12 countries across Europe; Austria, Bulgaria, Cyprus, France, Germany, Netherlands, Portugal, Romania, Spain, Sweden, Turkey and Scotland. The project started in August 2006 and was recently extended for a further 9 months until April 2010.

URBAN-NET aims to structure and coordinate research on urban sustainability in Europe by identifying and addressing trans-national requirements for research and sharing of good practice, in order to support the implementation of the European Research Area in the urban research field, as well as other European policies and strategies relating to sustainable urban development.

URBAN-NET 's core theme for research is integrated approaches to urban planning and management. Specific areas for research have emerged through the process of identifying common strategic issues with an emphasis on the interactions between urban functions and sectors.

Activitities:

- Compiled an online database of European urban research programmes.
- Coordinated 2 transnational calls for collaborative urban research resulting in the funding of 16 projects to a total sum of 8 million Euros.
- Published a Strategic Research Framework Agenda which identifies priority research areas, key issues and principles for urban research programmes;
- Networked with other projects, associations, funding bodies etc to influence strategic agendas and initiatives including a Joint Programming Initiative (JPI) on Urban Europe plus other JPIs on demography and on climate change, plus research element of the Toledo Declaration signed by Ministers responsible for housing and urban development.

Marcel Houtzager
Regional Portfolio Holder on Green Policy, Recreation and Tourism
The Hague Region

Regional Spatial Policy with a Green Pillar in The Hague Region

The Hague Region is part of the Western conglomeration in the Netherlands called Randstad. It is the most urbanised part of The Netherlands and comprises roughly the four provinces with the four biggest cities: Amsterdam, Rotterdam, The Hague and Utrecht.

The spatial policy of The Hague Region is determined by the spatial developments in Randstad Holland and is characterised by enormous expansion of the built up area and big pressure on the green areas. Because of the various demands on land use the necessity exists for clear steering policy.

The specifics of the spatial and green policy in The Hague Region are defined by the fact that the green areas lie entirely enclosed by big cities. The cultural-historic value of the landscapes is often under pressure. Developers are eager to take every possible chance. Recreation needs to be carefully steered (with good accessibility, enough parking places, information boards, facilities, etc). Exchange between city and countryside is being encouraged: local products, slow food initiatives, care providing farms, specific recreation needs for the expat community and the new Dutch citizens.

The present spatial policy in The Hague Region encompasses of a Regional Structure Plan, a Green Policy Plan, Green Funds and Execution Program. The region is operating in close cooperation with Central and Provincial government, the branch organisation of the farmers, the Water Boards and the private sector. It sustains well-functioning green areas (ecologically sustainable and vital). Special attention is being paid to biodiversity and water quality. One of the key tasks of the region is ensuring a good balance between urban and peri-urban through integrated planning and inter-municipal cooperation. The region strives after building 80% of the new developments within the city boundaries, connects development of green areas with public transport, and develops parking facilities at the edges of the cities.

The challenges that lie ahead of the region are quite a few - efficient regional steering, attracting investments, developing further the Spatial Strategy, Investment Program and Process Agreements, ensuring good partnership with other authorities, the private sector and the research community. The Hague Region has been a case study region in PLUREL and has learned a lot about cooperation with science. The regional portfolio holder on Green, Tourism and Recreation M. Houtzager has been on the Board of Stakeholders of Plurel and has worked intensively to assure good understanding of the practical applicability of end results of Plurel. Applicability of the end-results is essential for the success of future cooperation between policymakers and researchers and the effects of research on regional and European policy.

Binyi Liu
Professor, Chairman of Landscape studies department, Director of Landscape Science Research Institute
Tongji University

The Development Trend of the Rural-Urban Fringe and its Response Pattern of Planning in China

During China's urbanization process, the rural-urban fringe shows the urbanization trends developing from countryside to the modern city, which leads to the main issues including the nature of land conversion and the corresponding mechanisms for supporting the policy, industrial distribution and that of the proportion in three industries, the new living environment, the change of ecology from the original countryside environment to modern urban environment, and the change in existing cultural habits, and so on. This paper will describe and discuss issues including the current situation, development trends and its response pattern of the planning.

In the Pearl River Delta, one of the typical regions, rural-urban fringes which have lush vegetation throughout the year, forming a rich green landscape are mostly located in the river water network. To promote the city's rapid expansion, large villages and widespread real estate development projects appear in the rural-urban fringe. Three situations come: the urban complex surrounded by the countryside villages, the countryside villages were surrounded by the urban settlements, as well as the co-existence and complex hybrid of urban and rural. Focusing on the Pearl River Delta region cored by Guangzhou City, issues about the existing situation and its development trend of the space; the orientation of land-use planning; decision-making and management of the land-use; the public participation in planning, decision-making and management were described and analyzed.

As an upcoming urbanization area, Pengshan Platform, in Shengzhou City, Zhejiang Province, China, ranged about 30 square kilometers, is one of the typical rural-urban fringe area. It is facing the same problems in its development. In its planning process, a regional planning approach of "reverse urbanization" was created: based on the regional coordination, the elements of the Feng-shui of the region, geographical features, animals and plants, landscape ecology, the visual landscape, the original inhabitants, culture, history and the others were considered. Using sustainable ecological development as the prestige, the new pattern of the urban development was discovered from the three scales, the macro-region context, middle region context of the urban-region of convergence with the old city, and the micro area context of the project, for the purpose of proper planning land use, guiding industrial development, promoting green infrastructure construction. The project provides a new way of thinking on the patterns of development and construction in the rural-urban fringe area, the development of ecological new city and landscape environment conservation and restoration.

Hilary Lowson
PURPLE secretary
PURPLE network

Bridging the Gap between Research and Policy Making in Peri-Urban Regions

The PURPLE network (www.purple-eu.org) consists of 15 large regions, sharing a mix of peri-urban characteristics, and acknowledging common challenges, opportunities and policy goals. Since 2004, PURPLE members have been working for recognition and awareness of peri-urban issues particularly in EU policy. PURPLE's policy makers, its politicians and experts in regional and local government, provide a constituency for PLUREL and similar research projects. Purple members work in an environment that is characterised by a lack of clarity about the impact of policy instruments, a constant need to compromise, often with short implementation periods ruled by relatively short political cycles.

The peri-urban regions and research
Acknowledging that our territories are complex and multi-functional, PURPLE members need the support of targeted research which can provide evidence: what is happening, what are likely impacts, what is the timescale, what works and what actions bring what results? Such evidence underpins policy arguments and enables qualitative and quantitative comparison of options. The political dimension of policy making means that 'difficult' decisions – those which may be potentially unpopular, or expensive, or just unfamiliar - lose out.

Research can help support policy development which is innovative as well as bolder and more radical by demonstrating what the pressures are and how to respond most effectively. In practice does this happen as much as it should – given the amount of potentially relevant research that is funded?

The 'Gap'

- Researchers and policy makers have different priorities and goals
- They work to different timescales (remember the policy cycles…)
- Researchers do not acknowledge the complexity of peri-urban regions and how policy issues overlap and compete. They need a clear understanding of governance structures, how they work, how decisions are made and the constraints under which politicians and their officials are operating.
- Communication is a hurdle in terms of language/jargon and presentation. Policy makers find it difficult to access information about relevant research (even at the university 'up the road'), and then difficult to understand it and fix its relevance to the specific local problem or issue.
- Even if the researchers are more pro-active and their results are made available, their presentation is often another barrier, so it takes too much time to read and understand them and then work out how to adapt them to a local problem. Clearer presentation and synthesis – a focus on what is relevant (backed up by the detail) – is needed.

Some possible solutions?

- Developing a peri-urban research network
- Annual meetings between researchers and policy makers
- PURPLE members on research project steering groups
- Researchers seek PURPLE endorsement of their proposals at an early stage of development.

Kjell Nilsson[1], Thomas Sick Nielsen[2]
[1]Coordinator of the PLUREL Integrated Project, Deputy Director at the Danish Centre for Forest, Landscape and Planning
[2]Project Manager of the PLUREL Integrated Project, Senior Researcher at the Danish Centre for Forest, Landscape and Planning
University of Copenhagen

Strategies and Tools for Urban Development and Sustainable Peri-Urban Land Use Relationships (PLUREL)

Urbanisation has arguably been the most significant process of land use change in Europe since the Second World War. Over 70% of Europe's population now lives in urban areas, which in turn have grown in area by almost 80% over the last fifty years (EEA, 2006). The most obvious signs of this shift towards urbanisation are urban sprawl and the emergence of peri-urban areas, characterised by scattered built-up residential, industrial or commercial areas and dense transport networks, but also by the establishment in some places of green belts, recreational facilities, urban woodlands and golf courses, the conversion of farmstead complexes into housing and changes from conventional agricultural land uses into hobby farms and rural areas within easy reach of the city.

The different spatial patterns, cultures, planning policies, and various driving forces of urban growth or decline, result in changes of land use and functional linkages between urban and rural areas. The changing nature of the relationships between rural and urban land uses has deep consequences both for people's quality of life, for the environment and ecosystem services. These changes are most dynamic, intense and visible in the peri-urban zones which are therefore the main object of study. To understand the processes that drive land use changes, it is necessary to analyse the causes and effects, to improve knowledge, and to create better methods and tools to assess the future social, environmental and economic impacts of these changes. Only then can effective planning strategies to achieve sustainable land use systems be identified.

The aim of the PLUREL is to contribute to a deeper understanding of the changing relationships between urban and rural land use with an emphasis on the dynamic peri-urban areas. It develops methods and tools to assess the environmental, social and economic impacts of land use changes. Potential strategies and good practice examples are identified in order to promote the sustainable development of land use systems in Rural-Urban Regions, and especially the peri-urban zone.

The driving forces and pressures involved, ranging from global to local conditions and concerns; as well as the multiple agents and policy levels; requires a multi-level approach in research. Thus PLUREL has worked at the pan-EU level as well as at the regional and local level. For the pan-European level PLUREL has developed typologies for Rural-Urban Regions, as well as future scenarios for spatial development. These scenarios are assessed for effects on land-use change, peri-urban land use relationships, as well as wider sustainability impacts, delivering outputs at NUTS2/3 level across the EU. For the case study level PLUREL combine detailed collaborative case studies and stakeholder scenarios for peri-urban development pressures, planning and governance systems – with the development of quantitative land use scenarios, for the assessment of peri-urban land use relationships and sustainability impacts, both from regional policies and external driving forces.

Six European case studies allow in depth exploration of the land use relationships between rural and urban areas: Warsaw, Leipzig, Haaglanden, Manchester, Montpellier, and Koper. The case studies reflect the variability of geographical, economic and social conditions prevailing in Europe but they are also characterised by different cultures of governance expressed by regionally specific governance and spatial planning strategies. Population trends differ remarkably between the case study regions, and range from

growing areas (poly-centric Haaglanden, Montpellier, mono-centric Warsaw) to a region with significant and ongoing shrinkage in terms of population decline and land use perforation (Leipzig). A Chinese reference study explores the relevance of the results to the very rapidly urbanising areas in Asia and to get an external perspective on the spatio-temporal developments. Hangzhou, a rapidly growing rural – urban region of 6.6 million inhabitants has been chosen for this.

The main outcomes from PLURELs multidisciplinary, multi scalar research approach are end products aiming to support policy development and assessment at the EU level as well as at the regional level.
The PLUREL XPLORER with Interactive Impact Analysis Tool (IIAT) will be an online tool allowing the users to browse the evidence on peri-urban land use relationships and sustainability effects, including maps and output data, as well as possibilities for comparison of scenarios or regions. An online version of a land use model MOLAND Light will allow stakeholders to play with scenario development at the regional level. The book 'Peri-urban development in Europe' and the policy brochure on peri-urban issues will synthesise the results from across the PLUREL project including the generic lessons of the project as well as the contextual richness of the case studies; as well as address policy relevant key question raised by end users towards sustainable peri-urban development in Europe.

Christof Schremmer
Dipl.-Ing., Co-ordinator of SUME (EC FP7)
Austrian Institute for Regional Studies and Spatial Planning

FP 7 Project SUME, Sustainable Urban Metabolism for Europe

Long-term perspectives for the improvement of Urban Form and Urban Planning for Energy, Transport and Resource Efficiency

The research project SUME is about how the spatial form of urban systems can be designed in a way which is consistently consuming less energy and land, contributing to improve environmental conditions in a climate change agenda.

Cities are laid out in spatial terms in the most different ways – for historic, economic and cultural reasons. But what about the future – do these various urban forms hold up against the urgent needs to make life more sustainable, more energy efficient? With less transport, with less use of materials? SUME attempts to show how urban resource use is being influenced by the spatial form in which cities are being built. And it tries to point out ways to design cities – and to change existing cities. The challenge is climate change, as a global phenomenon. Urban centres are strongly affected by climate change. However, cities are also a key contributor to climate change, as city activities are the main source for carbon dioxide (CO_2) emissions. If global efforts to address climate change are to be successful, they will need to integrate city requirements and environmental management capacities (UNEP/UN Habitat 2009).

Impact of urban form on resource use

Cities - urban systems - use flows of resources, energy and waste to maintain life in them. To build cities also uses substantial resources for the building process.
The spatial form of cities – the densities used, the layout, the transportation grid - has a great long-term impact on the resources needed for the daily operations within an urban systems over time. The amount of energy needed for heating, cooling and transportation, and also the land needed for its expansion. It is extremely important to understand these issues well, since building cities in a specific form has consequences reaching far beyond one or two generations. The SUME analysis and modelling will show the impact of various urban forms on resource use, providing long-term development projections for a number of case study cities.

The Project Objectives

Driving forces shaping urban development processes are demographic change, the performance of urban areas in (global) economic competition, the innovative capacity under various societal conditions. How these drivers actually shape urban development in spatial terms is little researched. How decisions on urban form in the long run influence urban systems´ physical interaction with the environment – the use of resources - is far less understood. The principal goal of the SUME research project is to close that research gap, leading to urban spatial development concepts which provide the ground for more sustainable urban areas in the future.

Urban policy choice for the future: Urban development scenarios for 2050

As an example from the urban development scenarios: Will the urban zone (in red colour) of Vienna expand by 54% (as in a Trend-Scenario while the Trend-scenario continues to develop additional housing and infrastructures in the densities and spatial distribution of the peripheral segments of the urban zones, the SUME scenario follows a consequent urbanization policy, focusing on lines and nodes of public transport, increasing building densities in a moderate way. All this – over time – has far reaching impacts on the modes

of travel, travel distances, land being used and, subsequently, on energy needed for those purposes.

Expected Results
Based on an urban form and development survey of European cities, a number of them will be selected for scenarios and case studies. The expected project outcomes include:

- a number of spatial development scenarios for selected cities (until 2050), such as Vienna, Munich, Newcastle, Stockholm, Porto and Athens
- comparing trend and SUME spatial development as a basis to analyse policy options
- develop and apply a spatially-explicit urban resource flow (metabolism) model, to be tested and applied in case study cities
- an agent-based model component to allow the simulation of urban planning decision-making
- an investigation of actors and planning policies and institutions relevant to influence the spatial dimension of urban development, designing appropriate policies and policy tools
- an urban planning and evaluation method to analysed the impact of large scale urban development projects on the overall resource performance of a city) or by 14% (SUME-scenario) until 2050?

Henrik Vejre
Associate Professor
University of Copenhagen

The Copenhagen 1948 Finger plan – a comprehensive plan for urban growth, infrastructure and open space

The Fingerplan of 1948 was a proposal for the general development of Copenhagen. The plan addressed the sectors housing, industry, transport, recreation, supply and disposal. The iconic front page of the Fingerplan indicates its basic idea: the palm of the hand being the hitherto layer-upon layer developed city whereas the fingers constitute the future band-shaped suburbs to be developed along the major traffic routes. This pattern plan should create easy access for the suburbanites to the commercial and industrial centre, and provide access to recreational areas in the wedges between the fingers. The open space wedges should however also provide farm land, and space for future infrastructure. In the two decades after the formulation of the Fingerplan, the population increase implied a huge area demand which forced the planners to let the fingers grow increasingly thicker and the wedges accordingly narrower. Further, the area demand for each housing unit and the industry area demands grew beyond imagination of the 1940s. As a consequence of the growth of the city, the original mono-centre city was substituted with a polycentric structure, where each finger has at least one commercial centre of its own. During this period the wedges were under strong pressure. Two of the wedges were safeguarded by planning initiatives in the 1960s and 1970s. The third was almost eliminated. The reason was primarily lack of appropriate planning and legislation. The industrialization of agriculture and the opening of the international food markets eliminated the need for production areas close to the city, and the wedges were transformed to almost pure recreational areas. The wedges have developed differently, according to the authority in charge.

The development of Copenhagen shows however that the basic idea of the Fingerplan has been followed. And according to the present 2007 version of the Fingerplan, it will be followed in the next decades as well. Several contemporary trends may challenge this urban pattern however. The climate agenda may suggest a more condense urban pattern in the future due to the high transport needs with the dispersal of urban areas. The proximity of urban areas to open space may on the other hand help in climate mitigation. Open space may offer cooling effects and space for flood water.

The seven decades of Copenhagen planning has proven that a simple guiding principle for urban growth may be very resistant during changing conditions in society, but that it is essential that the legislation keeps pace with plans and visions.

Pamela Warhurst
Commander of the Order of the British Empire,
Chair of the Board of Forestry Commissioners, UK

A new generation of partnerships as drivers for regional development: experience from the Greater Manchester region

The new UK government has taken down much of the framework for regional and strategic planning, with a drive to the 'new local-ism'. This is fine for issues which fit inside local authority boundaries. But for other issues, such as urban-rural linkages, eco-system services, landscape management, strategic infrastructure, etc, we are now going through a rapid learning curve. Some in the UK look ahead and see only 'chaos and cuts': but there may also be opportunities and alternative ways of making public policy and investment.

For this the PLUREL 'experience' has been invaluable. We have exchanged across the EU, matched physical to social science, (started to) link science with policy, and looked at how to build integrated solutions from a set of parts. It's fair to say that one of the PLUREL results is that we need 'more research', and we hope to continue that in the UK. We also need to continue building some kind of common language, so that different sectors and disciplines can communicate with policy makers and the public, especially to respond to challenges such as the peri-urban which cross so many boundaries.

There is active debate in the UK on these issues. 'The Economics of Ecosystems and Biodiversity' (TEEB*)* is being launched, with a major test case in the South Pennines, the upland peat-bogs between Leeds and Manchester. The government agency Natural England has re-opened the debate on Green Belts and the urban fringe, looking for more multi-functional, responsive, joined-up policy. The Forestry Commission is looking at ways to continue the theme of the 'Community Forests' which were started not only as a 'greening' of post-industrial urban-rural fringes, but as a new model for multi-sectoral community partnerships. In forestry as with others, alternative models of civil engagement are emerging: not only with local communities, but a whole range of interests, from landowners and utilities, to education and health, large and small enterprises, mutual funds or cooperative finances. Various city-regions, when the planning system picks up the pieces, will be looking at urban-rural links and green-blue infrastructure, as a way to improve quality of life and economic vitality for both urban and rural.

It's also relevant that in the UK (of which Manchester is a good cross-section), we have some experience of managing the urban-rural interface, i.e. the Green Belt. In some ways this is all about protecting property values for the already affluent. It is generally successful in containing basic urban growth: but then we find that large parts of the countryside have turned urban anyway, in many aspects of economic and social life. The Green Belt could be (and in some areas is already) not a sterilized no-mans-land, or an area of horse stables for the very wealthy: but rather a multi-functional, diversified 'human eco-system', which provides a wide variety of services both within and to the wider area.

So which way to go from here? We need more integrated spatial planning, for multi-functional landscapes, with better ways of linking with economic factors and social attitudes, with enhanced public participation and debate. But there are also lessons which are really beyond public policy. Experiences such as the Todmorden Incredible Edible scheme show the potential, if various sections of the community start working together, mobilizing huge aspirations and unlocking hidden resources.

While this is seen to work well in a closely-knit market town surrounded by unique landscapes, the next challenge is to scale upwards and sideways, to other less favoured parts of the city-region. Such ventures go far beyond what can be delivered top-down, or with large public funding, which is very unlikely for the next few years. They point towards new ways of mobilizing and generating added value for both urban and rural, again exploring the possibilities in alternative models for civil society.

PLUREL

Topic 1

Urban-Rural Regions in a Globalised World: Driving Forces on Land Use Change

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The Effects of Capital on Land Use in Rural Areas through the Process of Globalization in Turkey- Bursa Cargill Case

After the Second World War, rate of urbanization gained speed generally in all countiries, and in Turkey, as well, and through the urbanization process, rapid changes and transformations arised in the surrounding areas of existing cities. After this transformation, especially in metropolitan cities, fertile agricultural lands in the rural areas nearby the urban lands were displaced by urban land uses.

Within the globalization process in Turkey, in 2000s, so many changes in land use politics of rural and urban areas occured with the influence of international politics. Lots of legal arrangements went through and the conception of rural and urban planning has changed. As a result of increasing rate of urbanization surrounding rural areas in big cities merged into urban development. The globalization and the industrialization whereby not only the rural-urban fringes influenced, but also, in some cities, as a result of 'urban sprawl', agricultural areas were threatened.

Cargill Agriculture Industry and Trade Inc., among the top five in agriculture / food sector in the U.S., went into production of corn processing plant in Bursa Province, Orhangazi County, Gemic Village, on about 22 hectares firstrate agricultural land, at the lakeside of Iznik Lake, in 1997. Cargill selected this location for proximity to raw material, low land prices and to benefit from urban resources. There has been several legal cases, started against this plant, established on fertile agricultural land, but they resulted in incompatible judgements.

However, in 2005, the area where the corn processing plant located has been declared as 'Special Industrial Zone' by the Council of Ministers Desicion. In the same year, Soil Conservation and Land Use Law has been accepted by the Turkish Parliament; yet the clause, states, facilitises established on agricultural lands before this year, are allowed with the condition of paying the land cost, has been added. In other words, by means of this law, the plants on agricultural areas were absolved by civil fine. Initially, the Lake Iznik District 1/25.000 Regional Plan revised as Lake Iznik Environment 1/25.000 Regional Plan Revision, concerning the area, included in the agricultural areas under conservatin in the Lake Iznik District 1/25.000 Regional Plan. Besides, in 2007, another legal arrangement was regulated, regarding use of productive agricultural lands for non-agricultural functions.In less developed countries, international capital have started to choose not around the city as site selection, but also in rural areas. Types of land use in rural areas and physical planning decisions have been changed and used as agricultural land for urban purposes. In this sense, springing and site selecting in rural areas of urban land use types can be evaluated as 'urban fringe'.

This paper aims to highlight the effect of land use changes in urban-rural areas and in this context, aims to show the effects of an international company within the discourses of globalization in a less developed country. It will also be showed that how globalization manipulates legal regulations into its own favor and, how it is an obstacle for urban-rural land use and sustainability of natural resources in these countries.

As the method of research; for current land use for the Cargill plant area will be analyzed; plans for the area: landscaping plan, development plan and development plan revision wil be compared; the current land use transform processes and related data will be evaluated; and for a sustainable urban-rural physical planning 'what should be done' (recommendations) will be developed.

Meliz Akyol, Hayriye Esbah
Istanbul Technical University

Permaculture as a Tool for Sustainability in Cities

Establishing the urban rural linkages is a critical endeavor for the quality of life in urban areas. We aim to discuss the utility of permaculture principles in peri-urban areas to promote sustainable communities. We also seek answers to the questions: How do we use permaculture not only in rural but also in core urban areas? Can we recognize energy efficient designs as emerging concepts for permaculture, and permaculture as a tool for sustainability?
First, we present underlying forces of urbanization in Turkey as well as demands on land use and resources. Second, we introduce permaculture and energy efficiency within the context of landscape urbanism. This part will be supported by national and international case studies. And finally, we will develop planning and design recommendations for sustainable development of rural urban interface.
We believe that designing with permaculture is a sound approach for sustainable future of our urban environments, and lessons from Turkey's case can be helpful for other developing countries.

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Possible European futures: 4 scenarios elaborated based on population; energy price; world economic activity; R&D investments; and carbon price drivers.

The future is uncertain and not predictable nevertheless the anticipation for future is indispensable to prepare now the necessary adaptation to future changes. In this context, scientists use the concept of scenarios in which they try by extrapolation, imagination and knowledge to predict how might be the future. We present four scenarios about possible futures for European Union and to build them we use scenarios developed for the PLUREL project and based on IPCC SRES. The four scenarios are differentiated by their respective orientation, either towards a global and top-down dynamic or a regional bottum-up dynamic and either towards social and environmental values or private and economic values. These scenarios are defined in a qualitative manner through storylines used to quantify main drivers that are implemented, in the large applied economic model NEMESIS, to assess the scenarios up to 2025. We concentrate on 5 main drivers: the population and its structural evolution that define the labor supply and then the labor market equilibrium; the energy and particularly oil price that acts on economic activity through production costs, transportation costs and heating costs; the World economic activity that partially defined the economic performance of EU countries through external trades; R&D investments that, by productivity gains and rise of goods quality, transform the economic activities in EU countries; and finally carbon price constraining the fossil energy uses and pushing up the technological development and use of renewable energies. The NEMESIS model is a detailed macro-econometric model for EU covering 32 production sectors and 27 consumption goods in each EU countries. Comparing to other economic models, the NEMESIS model has several advantages, it is enough detailed to take into account structural change in the European economies, it is designed to integrate some aspects of the recent endogenous growth theory through R&D investments and knowledge externalities and it also includes a land-use module that treats land claims hierarchically and determines a agricultural land use price that reflect the land scarcity in each EU countries. We present and explain in this paper the drivers and results of the PLUREL scenarios simulations with the NEMESIS model.

Mads Farsø
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The concept of landscape in landscape(d) urbanism

This paper addresses the notion of *landscape* in recent theory on landscape and urbanism, especially within the fields that sees these as interwoven - e.g. in concepts of peri-urban landscapes, urban landscapes, urban-rural regions and suburban landscapes. What is the meaning of landscape in this new peri-urban urban-rural landscape urbanism?
Main question is how the concept can be differentiated within the positions, fields and agendas: Is landscape a concept for an object or something subjective? Can it both be a quantitative and qualitative notion? Is landscape used to illustrate a process or is it only a metaphor in the lack of a better concept for the urban? Is landscape used to frame or to imaging? Does landscape reflect a 'box', 'biotope' or a 'network'-thinking? Is landscape more *relational*? Is it historic or less historic? Is landscape more ecological in its meaning than 'region'? How does landscape actually differ in a debate about the regional? Or is it just *all the same*?
Focus will be on the new literature within the field landscape urbanism which is a cross over of landscape architecture, urbanism and urban theory writings. These have grown out of a demand of a new language for the contemporary city that can better relate to globalised forces that inflict land use change. Some of its key texts state that landscape is infrastructure. In this context we are experiencing new systems, new flows, new forces, new powers in the urban-rural region. But what could make a landscape instrumental? What makes it a potential for theory? Is it the *peri-urban*?
Finally, who decides about these new peri-urban 'landscapes'? The ones who coin it? The ones who research it? The ones live in it? The ones who imagined it? This is some of the topics that this paper will to debate.

Dagmar Haase, Nadja Kabisch
Helmholtz Centre for Environmental Research - UFZ Department Computational Landscape Ecology

Diverging European cities – The drivers of urban population development 1990-2008

A complex mosaic of urban population paths characterizes Europe in the 21st century: cities gaining population exist next to cities loosing population.
In this paper, we identify and show evidence of this population dynamics between 1990 and 2008 using the case of more than 200 European cities. To approximate this issue we applied the cyclic quantitative model of the stages of urban development. We use the model because it relates to different population dynamics of urban growth and decline and focuses on the core city and fringe area which both constitute an urban agglomeration. As new trends of current European urban development are evolving, which are assumed not to be reflected by the conceptual structure of this model, we scrutinise its validity against our results. We further identify the driving forces of diverging urban population development. In particular, we focus on local pathways and historical events, but also on different significant drivers of urban trajectories such as migration, natural increase, and economic fortunes. In addition, we analyse what kind of influences do have globalisation and the demographic change. Finally we quantify the impacts of population growth or decline on urban land use change using urban residential area and housing space per person.

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Swiss Federal Research Institute WSL

Understanding patterns and driving forces of the Swiss periurban landscape through benches, signposts, and a wealth of other small objects

The Swiss periurban landscape is interspersed settlements, characterized by many small objects such as benches, signposts, and fruit stands. This landscape is still hard to grasp, partly because of the lack of appropriate models for periurban land dynamics and partly because of a lack of data at an appropriately fine scale. Our study is based on a conceptual model for periurban land dynamics in Switzerland that includes four processes and their driving forces. The research goal is threefold: (1) to develop and test a method to inventory the small landscape objects, (2) to describe the patterns of small objects in the periurban landscape, and (3) to investigate aspects of the conceptual model relating to driving forces and factors indicative for the spatial distribution of the small objects. We sampled 47 randomly selected 1 km² sampling plots in the Canton Aargau, Switzerland. In the sampling plots all objects not included in the topographic map but big enough to be perceived by a pedestrian were recorded. We recorded 1320 observations for 157 objects. Preliminary analysis shows that 42% of the observations can be associated with recreation, 26% with forestry, 16% with infrastructure, 10% with agriculture and 6% with others. Current investigations indicate that driving forces indicative for the spatial distribution are unique to the four processes described in the conceptual model and strongly relate to distance to settlements and topography. The inventory reflects the enormous complexity of the periurban landscape but allows deepening our understanding of the patterns, processes, and driving forces of the periurban landscape.

Patricia Jacob
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Casablanca between planning and informal development

Unlike most cities in Western Europe being confronted with a shrinking or stagnating population, many cities in emerging economies experience a fast population growth. This development produces a growing demand for building land suitable for housing, offices, industry and infrastructure. Besides the dynamic, another important difference is the role of unplanned, informal construction. The procedures for planning and surveying are often too slow and too expensive to provide sufficient building plots and a part of the population is too poor to afford other forms of housing. The resulting informal development has an impact on the pattern of land use change.

What is the role of informal processes, e.g. illegal land subdivisions and pionier land uses in the urbanization of peri-urban space and how does it influence the pattern of urbanization? How is the formal and informal production of space connected?
On one hand informal developments partially lead to unhealthy living conditions and inappropriate building locations e.g. settlements in zones threatened by inundation, but on the other hand they provide a quick reaction to a market failure and fulfill a demand that could otherwise not be satisfied.

The drivers of the production and transformation of built space are elaborated on the case of Casablanca, Morocco's economic centre. The focus lies on the peri-urban space being most under pressure in the process of land use changes.

Casablanca has passed from 25 000 inhabitants at the beginning of the 20ies century to 3 Mio only 100 years later and expanded in a concentric way around the medina and the harbor. The sphere of influence of the core city is extending and the peri-urban land assumes functions for the urban agglomeration. Disperse settlements gradually change the formally rural character and agricultural use is abandoned due to the price that can be obtained for potential building land. Industrial uses are relocated from inadequate areas in the centre towards the periphery, followed by housing both in form of islands of shanty towns and quarters with economic housing. At the same time large satellite towns for about 300 000 new inhabitants each are planned. Another factor influencing the accommodation of land uses is the possibility to mobilize land for building. This aspect is closely linked to the forms of land tenure existing in Morocco, including different collective forms and the fact that a minority of plots is registered in the cadastre.

Konstantinos Lalenis, Dimitrios Kalergis
University of Thessaly

Spatial Planning Systems in E.U. and North America: still members of an extended family?

The proposed presentation aims to complement related research conducted as an integral part of the PLUREL project. In PLUREL, a review of EU administrative/governance and spatial planning systems is prepared, with emphasis on the formulation of a typology of these systems, based on legislation in force in the EU nations, national specificities and planning approaches.
This presentation focuses on the spatial planning sector and a main objective of it is to examine whether the spatial planning systems of Canada and the U.S. can be included in the typologies developed for the European systems. Historically, the North American planning systems were considered as deriving from the Anglo Saxon family of nations' tradition, although the degree of federalization in the related government structures (provinces, states) made them also related to the Germanic family. In mid and late '90s, Canada and the U.S. were included in research related to families of nations of various domains (legal, administrative, transport), together with European countries. In the last decade, though, related research in Europe seems to focus exclusively on E.U. member states, driven from a need towards Europeanization of the sectors of administration and spatial planning. (ESPON 2.3.2. & 3.2., Rivolin and Faludi: 2005, Farinos: 2006, NORDREGIO). Institutional transplantation in planning issues has also been developing in both sides of the Atlantic but not so much between the two sides. Nevertheless, interest in comparative analyses of American and European systems never ceased, and this research aims to contribute in "bridging" this gap. Globalization has brought countries very close, and in the case of European and North American countries, there is an even closer cooperation in research and scientific/academic activities. Furthermore, equivalence in the domain of spatial planning makes institutional transplantation possible and mutually useful.

The research related to this presentation will examine the most recent and well known typologies of spatial planning systems/styles/concepts at the national level, in the EU-27 countries and U.S. and Canada, and will attempt to suggest a common typology. This might serve as a basis for a first level of analysis for the equivalent clusters of North American - EU countries, and a second, more elaborate level for individual countries representing each cluster. In this way, cross case transfer of results will be possible as well as the generalisation of the results and their inclusion in policy formulation.

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Counteracting sprawl and land consumption in the urban-rural interface of the European agglomerations Milan and Cologne/Bonn: framework conditions and planning approaches

In many European countries, patterns of settlement-growth and dynamics of economic development are discoupled from the demographic development. Despite of decreasing population numbers, urban expansion due to spatial development pressure has been the driving force of enormous land consumption, the usage of natural resources and the loss of ecosystem services during the last years. This paper presents a comparison of two different geographic areas – the region of Milan (Italy) and the region of Cologne/Bonn (Germany). It starts from descriptive basic indicators (land use composition indicators in two different ages; population dynamics, main economic indicators; etc.) and assesses associated trends of land use/land consumption/environmental effects in these two macro regions.
In doing so, this paper is to be understood as an initial starting-point for a pluri-annual research-cooperation between the Politecnico di Milano and the University of Bonn. Until now, political ambitions to reduce land consumption are either too weak or ineffective in both countries. An international comparison can help in accelerating to tackle the issue of land consumption into consideration by the international board within the EU. Until now, the role of land consumption is too weak and too underconsidered amongst planners and politicians. Following these issues, the paper focuses on three major research-fields:

1. Efficiency of Italian and German planning-instruments to reduce land consumption
2. Demographic trends and their impacts on land-consumption and settlement-pattern in Italy and Germany
3. Acceptance of the local politicians and the society itself of a fostered reduction of land consumption

Antti Vasanen
University of Turku / Regional Council of Southwest Finland

The impact of residential preferences on peri-urban spatial structure in the urban region of Turku, Finland

During recent decades, urban regions across developed countries have experienced considerable changes. The outward shift of population and the overall deconcentration of urban regions have characterised most cities; a trend initiated by the development of public transportation systems and accelerated by private car ownership. More recently, globalisation, the rise of the information based economy and changing demographic composition have dramatically changed the structure of urban regions as traditional monocentric cities have given way to more polycentric urban constellations.

The deconcentration of urban population, whether resulting in urban sprawl or polycentric urban development, is a result of a number of different factors. One of these factors, emphasised in various studies, is residents' preference for a certain type of dwelling or residential area. In housing research, residential preferences have been approached in two ways. In the first class of studies, residential preferences are considered to be revealed in individual housing choices. This approach, however, gives an overly simplified view of residential preferences as the choice of dwelling always involves a number of other factors, such as dwelling price, travel time to work or local school quality. In studies applying the second approach, respondents are asked to state their preference in the context of a hypothetical moving situation. This approach can obviously better answer to the question of what type of residence people actually do prefer. However, the relationship between stated preferences and the process of housing choice has rarely been addressed in urban research.

In the paper, I concentrate on the issues of residential preferences and housing choice using the functional urban region of Turku, Finland, as a case study. Turku urban region is the third largest city region in Finland with over 300,000 inhabitants. The research problem is twofold. First, I examine what kind of spatial patterns exist in the urban region concerning the different factors of housing choice. Second, I deepen the analysis through the spatial comparison of the central and peri-urban parts of the region and address what factors of housing choice, on the one hand, and residential preferences, on the other, explain the decision of residing in different residential environments.

The empirical data of the study consist of the results of a residential questionnaire, which included 1,137 respondents from the Turku urban region. The data provide geographically referenced information on the respondents' current dwelling choices, (stated) residential preferences and housing satisfaction. The data are analysed using statistical and GIS analyses.

PLUREL

Topic 2

Scenarios: Futures for Rural-Urban Regions

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Land use scenarios based on a participative design

How do practitioners and regional stakeholders see land use changes in a rural-urban region? Which forming conditions are considered essential and how are the resultant land use changes evaluated? What, accordingly, are appropriate steering options? These questions were tackled between PLUREL researchers and spatial planning practitioners during a scenario workshop in the Leipzig-Halle region in spring 2009. Practitioners came from diverse sectors of the planning administration mainly, such as green space and infrastructure planning at the local and regional level. The workshop thus provided a cross-sectoral perspective on land use change, though with a clear focus on planning officials' views.

The scenario workshop was conceptualised to explore future land use patterns for the Leipzig-Halle region under diverging assumptions of demographic and economic development and spatial planning. Based on such assumptions, the following starting points were given: Managed Shrinkage, Uncontrolled Growth and Managed Growth. Using background data provided by researchers, the participants were asked to develop land use scenarios in three, consecutive stages. First, a spatial vision for the year 2025 was created. The resulting maps and land use patterns give a spatial interpretation of the basic, quantitative conditions of the respective PLUREL models. During the second phase, the forming conditions of the scenarios were outlined and economic and demographic drivers as well as the role of spatial planning were discussed for each scenario. Finally, participants acted as members of a "regional council", evaluating the social, economic and environmental impacts of the scenarios.

This discursive approach enabled scientists to gain a more locally grounded perspective on land use development. The scenario results, to be presented as spatial visions and discussion briefs, informed land use modelling in the PLUREL project and provided a focus for the analysis of spatial planning in the Leipzig-Halle region.

Beatrice De Carli
Politecnico di Milano

RE: Re-cycle, Re-use, Re-frame

Wave after wave, as the modification of the territory progresses, whole areas are endlessly re-processed: lands are abandoned and cleared, they fall vacant or derelict, they are repossessed and reclaimed. As the by-products of such transformations, open spaces emerge in the process which represent a state of “in-betweenness”: a murky condition dangling between a functionally determined past and the open possibility of more lucrative forms of development. This phenomenon concerns not only single plots of land isolated within the built fabric, or thin parcels laying along infrastructures, but – more strikingly – equally involves vast fragments of open agricultural land, gradually decaying as they fall out of the logics of industrial productivity.
In the absence of the will or ability to overcome the root causes of their “decay”, projections on the future of “residual” open spaces are often limited to a small-scale question of image. Seen in this light, underused, wasted and abandoned lands present a "problem" – a lack of definition – which can be temporarily fixed by the means of beautification and by minimizing the possibilities for unrequested uses.
The paper embraces on the contrary a simple hypothesis - the “residual as material” for the project – to explore the opportunity afforded by the re-transcription of residual open spaces for articulating alternative images of the territory on the large scale. As a result of their capillary yet pervasive presence in urban/rural areas across Europe, in fact, these underused spaces make a tremendous asset for both the spatial and environmental regeneration of the territories where we live in - an asset to be exploited by experimenting modes, forms and concepts of re-investment alternative to more conventional market-driven forms of development.
Starting from a case study in the urban region of Milan, Italy, the contribution will develop through a strict sequence of interpretative maps aiming to unlock the underlying logics that generate residual open spaces and to translate it into a series of projective visions on their possible re-use – shifting from a design to a large scale perspective and vice versa. Stressing the potential system’s value of residual open spaces, and the challenge to constructively make use of it, emphasis will be placed on their physical characteristics (frequency and spatial consistency, granularity, connectivity) and on their crossed relations with both landscape infrastructures and urban fabrics.

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A comparative study on future land use scenarios in four European cities

The MOLAND model has been applied to more than 40 areas of variable size in Europe covering a total area of more than 50,000 sqkm. A significant number of scientific publications detailing the model, the methods involved, issues and different applications have been produced since its development in 1998.
In the context of the PLUREL project, MOLAND has been applied to four case studies: Koper, Leipzig, Montpellier and The Hague. In all four cases a number of storylines, corresponding to respective adaptations of generic scenarios previously developed in PLUREL, were developed by stakeholders. This common ground is what allows the comparative study presented here. Each case study presents their own characteristics and peculiarities but the future scenarios of land use produced by MOLAND are result of the application of these common generic scenarios.
The main purpose of this paper is then to present shared and divergent trends in land use dynamics for the four case studies which have the potential to form the basis for ulterior studies on the implications of different policies and settings in the strong and rapid transformation of the European territory.
The paper also highlights some issues related to data representation and dissemination currently affecting most geospatial models including MOLAND. In a first attempt to overcome such issues, the last section of the paper offers some representation and dissemination alternatives based on recent advances in geospatial visualization and multimedia.

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Grand Casablanca 2025 – new roles for the urban-rural relationship?

Within the coming decades Morocco will be faced with an increasing variability of temperatures and rainfall, leading to droughts, floods and rising health problems due to heat stress. Focusing on Casablanca, Moroccans megacity of tomorrow, as an innovation nucleus for the whole region, the initiated scenario process within the project "Urban agriculture as an integrated factor of climate optimized urban development, Casablanca" aims to explore the perspectives of urban agriculture in supporting urban growth centres and the surrounding peri-urban areas to adapt to the prospective climatic conditions and to mitigate the consequences of climate change.

Scenario methodology – specifics of the chosen approach
Developed mainly for military purposes in the 1970ths the scenario methodology has since then only been slightly modified. Whereas since the beginning of the 1980ths the methodology was frequently used for civilian uses in the USA and Europe its usage in urban planning processes in the African world is still a novelty.
The Casablanca region is facing a highly dynamic urban development, affected by interwoven informal and formal elements, pressurising the agricultural land use in the peri-urban areas. In light of the complex functional relations and impetuses within the urban netting that need to be analysed the scenario methodology was utilised as it appears "to be the methodology of choice, if discontinuities and uncertainties of any kind are to be considered with insufficient or predominantly qualitative information in planning processes"(Schwarz 1993).
Based on a common vision developed during the initial phase of the project, the bi-national project team identified the key factors influencing the possible future developments of Casablanca. In order to make use of the cognition capacity and the specific methodical instruments of the different disciplinary teams the chosen deconstruction / construction approach developed sectoral alternative scenarios that were subsequently blended into two all encompassing interdisciplinary scenarios.

Synergies and conflicts in the urban and peri-urban space – intermediary results
As an intermediary result, the blending of the sectoral scenario layers (water, energy, climate, food security, urban economy etc.) and the first attempts to spatialise the drawn conclusion allow to identify potential areas of synergy and conflict with regards to the following questions:
How and where can urban agriculture coexist with other apparently more profitable land uses?
To what extent can urban agriculture act as a provider of eco system services for the city?
To what extent can the urban population, by generating a substantial demand for regional agricultural products and services, contribute to the stabilisation and improvement of living conditions in urban-rural areas?

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Regional urban growth in four land-use change scenarios: a comparative analysis of the PLUREL case study regions

Urban land-use is generally increasing in Europe and this can be expected to continue in the coming decades. However, the intensity and patterns of urbanisation may vary depending on factors such as demography, transport mode preference or planning policy. Scenarios represent various combinations of these factors. This allows us to explore possible futures and their consequences on processes such as urbanisation. Here, we used four scenarios to study the potential patterns of urbanisation in six European cities/regions: Haaglanden, Koper, Leipzig, Manchester, Montpellier and Warsaw.
We obtained projections of the proportion of artificial surfaces for 2025 in Europe on a 1 x 1 km grid, by means of the regional urban growth model (RUG). This model uses regional projections of urban land-use, derived from projected gross domestic product (GDP) and population values, and distributes them spatially according to household location preferences and planning constraints. Household preferences are based on variables such as travel time cost to the nearest city or distance to the coast, while planning constraints use variables such as the presence of flood-risk zones. The scenarios determine the parameter values for the equations relating the input variables and the household location preference or the planning constraints. Some input variables (e.g. travel time costs) are also modified by the scenarios, while others (e.g. distance to the coast) are not. From the European projections, we extracted the data for the six case study areas to compare the patterns of urban growth and the influence of the scenarios on each area.
Although the same scenarios were applied to each case study area, the resulting patterns of change differ and some regions appear more sensitive to the scenarios than others. For instance, Montpellier shows very different patterns of urban growth depending on the scenario. On the other hand, Manchester shows very little growth overall, while Warsaw has high growth in all scenarios, with less distinct patterns than Montpellier. This is partly due to regional differences in the population and GDP projections used as input to the model, with some regions expected to grow far more than others. Another factor is the current level of urbanisation of each case study area. These results show how the different planning policies in the scenarios might influence future land-use patterns. They also highlight regional differences in terms of sensitivity to the factors included in the scenarios.

Vegard Skirbekk, Nikola Sander
IIASA

Prospects for later-life migration in urban Europe

The need for more accurate forecasts of future migration flows has increased with the relative importance of migration vis-à-vis other components of population dynamics. Although forced international migration has been given considerable research attention in recent years, also other migration types, in particular later-life migration, become increasingly important. In the coming decade, the large baby boom generation will reach retirement age. The objective of this report is to focus on the effects of an ageing population in terms of urban development and retirement migration. The report discusses the regional population projections and its social impacts. An analysis on the impacts of urbanization and differential ageing across regions will be given.

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European Urban-Rural Regions – A Scenario Assessment Tool for Decision Making; Case Study, Greater Dublin Region 2026

Europe's urban-rural regions attract growing attention as rapid changes in land use are expected due to changes in demography, economic developments and technology, environmental changes and the enlargement of the European Union. It is of increasing concern to decision makers, planners and the public, that the way our urban, rural and urban-rural areas are functioning may not be sustainable in the long term. For example, Ireland's population growth was five times the European average of 3.25% between 1996 and 2006. The counties within the Greater Dublin Region (GDR) experienced the biggest growth nationally with an increase of 8.3% between 2002 and 2006 (CSO, 2007). Dynamic land use models provide a spatial illustration of alternative development patterns and trends; they offer a basis for the analysis of the spatial implications of particular policies and the interactions of multiple planning actions. Additionally, developing alternative land-development scenarios brings an interesting platform for discussion when implementing urban-rural scenario policy reforms.

Using the GDR as an example (EEA, 2006), we applied the MOLAND model to simulate two future scenarios of settlement patterns by 2026:

Scenario 1: Dispersed development. In this scenario economic growth is observed due to increase of business activities, agricultural production and the service sector. New constructions are encouraged in the rural hinterland. Improvement of regional and local roads is implemented; the Dublin-Belfast transport corridor is encouraged. The scenario includes a low environmental protection policy.

Scenario 2: Compact development. Increased job numbers observed in industry, commerce and services making them about 30% more than in Scenario 1. Polycentric urban agglomeration associated with the conservation of existing buildings. New residential developments take place inside of the city, reducing average distance of travel to work. Public transport is encouraged; new transportation infrastructure and complementary measures are also introduced. A strong environmental protection policy is encouraged.

The results are discussed in terms of the implications of future settlement patterns for urban-rural regions. Within the GDR the residential dense class is dominant in Dublin County (63.8%), while the residential sparse class is dominant in Kildare County (26.4%). Industrial developments and commercial areas are the highest for the compact scenario, particularly in Dublin County.

Reference

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PLUREL

Topic 3

Land-Use Relationships and the Structure of the Rural-Urban System: European and Regional Models

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Exploring and simulating land-use patterns in the urban-rural interface

In this research, the expansion of land-use cells occupied by residential, service or industry buildings was studied. In addition, we attempted to reproduce the observed land-use pattern using the LUCIA land-use modeling framework (Hansen 2007).

The study area is a predominantly rural area, where there the total population has increased by 14169 persons, from 455135 to 46930, during a nine-year period, between the years 2000 and 2008. The study area comprises thirty nine municipalities of which the majority (29) suffered from a decline in population. As a contrast, in the municipalities affected by the economic up-swing of the city of Oulu, the growth rate in population were one of the highest in Finland for the last decade. For example the population of Liminka has increased by 49,5% from 5735 in year 2000 to 8576 in year 2008.

To support the study, raster layers representing the built-up cells in the years 2000, 2002, 2005, 2007 and 2008 were produced. The built-up cells were divided into residential, service and industry cells using data in a 250 meter resolution from the Monitoring System of Urban Structure (YKR). These data sets were combined with National Corine Land Cover 2000 data of the same resolution.

The spatial pattern of the new built-up cells was analysed to explore the factors behind the expansion of the built-up land-use. It seemed that, new residential cells have emerged in a scattered manner in the whole study area, despite in land areas reserved by Natura 2000 sites. However, the proximity to the existing urban structure and to the road network seems to have had an effect on the placement of new built-up cells. Therefore the expansion of new built-up cells was most evident in peri-urban areas.

The pattern of new built-up cells was simulated using the LUCIA land-use modeling framework (Hansen 2007). The scattered pattern of new built cells could to some extent be reproduced. In order to reproduce the observed land-use pattern, it was crucial to include the use of a random factor and to exclude the use of a layer of planned zones, when running the model.

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Interrelations between economic and population change and land use patterns in European rural–urban regions

The paper focuses on the evolving structure of the European urban and rural settlement system. PLUREL contributions to the study of economic – population – land use relationships are confronted with findings of other relevant applied research projects, such as the ESPON programme. Data used in the analysis, for NUTS-3 and NUTS-X units, cover some 20 variables pertaining to, among others, population and GDP dynamics, occupational activity level, proportion of population in working age, employment by sector, spatial accessibility.

Several hypotheses are tested concerning the differentiation of land use relationships among rural – urban regions. Attempts are made to find out to what an extent the observed variations can be attributed to size of the regions, their functional, as well as morphological types (according to the PLUREL RUR typology), their territorial position (as measured by accessibility level, connectivity within the system, as well as population potential), and to their situation in one of the major sub-continental divisions, such as North-West Europe, the Baltic Sea region, the Mediterranean region, etc.

As it is found out, while the large metropolitan areas across Europe tend to display increasingly similar economic, demographic and land use characteristics, differences among the predominantly rural regions remain quite profound. A question addressed here is in what measure are these disparities attributable to the differentiation of rural areas (as defined in policy – related studies) into: (a) these situated in proximity of large urban centres, (b) those with an interspersed network of smaller towns, and (c) the remote, peripheral rural areas.

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Urban Compactness: Measures, drivers and barriers: a land use modelling perspective

Forecasting scenarios using land use models can provide insight into answering the "what if?" questions for the future in order to assess which scenario is most beneficial from a given perspective. The urban perspective is taken in this research with two specific objectives: 1. To derive a robust approach for assessing the impact of different policy alternatives on urban compactness; and 2. To understand what mechanisms encourage and discourage urban compactness from a modelling perspective. In order to tackle these objectives, two baseline scenarios and five hypothetical policy alternatives are run from 2000 to 2030 using the pan-European EuClueScanner 1km resolution land use model. The results are analysed for urban compactness on the 305 Large urban zones (LUZ) provided by the Urban Audit, an initiative by the DG for Regional Policy.

Urban morphological patterns are quantified and translated into individual indicators describing the urban expansion patterns (fringe, ribbon development, compactness, leapfrogging) as well as the appearance of new urban core areas and connectors. A composite indicator for urban compactness is then derived using the individual indicators from the 305 LUZ dataset.

The mathematically derived composite indicator for urban compactness is then examined in further detail in order to better understand what factors encourage and discourage compactness from a modelling perspective. A data sample corresponding to roughly 10% of the entire dataset is taken based on the "hot spots" for urban growth, a tool embedded within the EuClueScanner 1km model. The sample represents hot spots that are common to both scenario baselines and their policy alternatives.

Results show that the impacts of policy alternatives are not only felt at different degrees for different LUZ, but impacts are often contradictory. Further analysis shows that the hot spot LUZs are not linked by country, and thus by the demand module and other national-level parameters such as allocation and neighbourhood rules; but rather by landscape composition in and near the LUZ. This occurs to such a strong degree that the landscape patterns near urban areas can be reclassified according to a "vulnerability" scale for urban transition and urban form.

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Agent-Based Models for simulating peri-urban Land Use Relationships: A Proof-of-Concept Study

Agent-Based Modelling (ABM) has successfully been applied to study complex social-economic relationships such as the evolution of society (e.g. Kohler and Gumerman 2000), economic systems (e.g. Axtell et al. 2002) and new agricultural practices (e.g. Parker et al. 2003).

We apply ABM to investigate the complex interrelationships between heterogeneous actors to understand land use and land cover change in the peri-urban area, as also previously investigated by (e.g. van der Veen and Rotmans 2001; Parker et al. 2003; Huigen 2004; Evans and Kelley 2004).

One key innovation of the use of ABM in PLUREL is that the relationship between policy and planning processes within the modelled system is made endogenous. This means that the simulated, future evolution of land use (scenario based) will result in policy responses that guide the evolving urban development in a certain direction.

We therefore conduct a proof-of-concept study to systematically explore the sensitivity of these models to different parameter
settings and modelling techniques and inform stakeholders and policy makers about these complex relationships.

We present a generic framework including agents representing Land Use Planning decision making, Land Use developers, businesses, demographics and residents, as well as pressure groups that seek to limit or encourage urban development. This framework is applied to a synthetic case study area, which has simplified versions of the structures and mechanisms found in real life.

In future work we will validate the models by setting up the framework to simulate different case studies, including Koper and Manchester.

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Land Use Change and Sustainability Performance of European Region Types

Urbanisation is considered as a major process of land use change. Construction activities for housing, industry, trade, services and infrastructure lead to loss of open spaces, formerly used for agriculture, horticulture or recreation. Undisturbed soils become sealed, population density and traffic increases. Urbanisation is, however, expected to induce negative environmental effects: on landscape aesthetics and landscape functions, such as regulation function, habitat value, biodiversity, but also on the agricultural production capacity itself. On the other hand, land use change in the peri-urban is linked to economic growth and increasing welfare in terms of working places, housing near to nature, reduction of individual traffic, are some of the reasons why e.g. young families move from town to the urban fringes.

Though the normative expectation proves correct in many cases, it is undeniable that an analysis of the relationship between land use changes due to urbanisation and their sustainability impact requires an in depth analysis that takes the diversity of conditions within Europe into account.

Developing a quantitative modelling approach at NUTSX scale, research in PLUREL made such an effort. The PLUREL integrated Impact Analysis Tool (iIAT) conjoins assessment results of positive and negative land use change impacts. The iIAT represents a meta-model that comprises normalised values of underlying regression models ('response functions') into common result presentation in form of spidergrams. Beyond single NUTSX and NUTS0 regions, it is possible to compare groups of similar regions, based on typologies. Typologies with reference to urbanisation processes act as a data aggregation mechanism.

Examples presented are regions with different innovation trends or sensitivity to natural or technological hazards. Two generic typologies that have been developed within PLUREL are the typology of migration types and land use change (Bell and Alves, 2009) and a typology of planning policy and governance system (Tosics et al. 2009).

Though the application of typologies is meaningful in this context, it also may lead to biased assumptions and to misinterpretations of results. In order to better assess the reliability of the PLUREL iIAT results at EU scale we carried out a statistical analysis of typology based data aggregation.

This paper presents the attempt to apply different statistical methods (e.g. multivariate analysis, clustering) to analyse the strength of the different typologies used and the explanatory value of different selected sustainability indicators.

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Interaction between urban and peri-urban: the case of commuting

Commuting is a good measure of urban structure because it links the distribution patterns of economical activities and settlement with transport. In rural-to-urban regions commuting reflects the interaction between urban and peri-urban areas. At the regional level the direction of major commuting flows is closely interlinked with urban structure. The structure of economic agglomerations defines the destinations of major commuting flows. Density, and the fragmentation of the settlement structure, influences the commuting distances. Transport systems facilitate the mobility between the origin and destination.
In this study we recognize the major commuting patterns taking place in contemporary urban areas. We use empirical commuting data to illustrate and model the interaction between the urban core and the surrounding functional region in different urban structures. Monocentric and polycentric urban forms differ considerably in terms of commuting patterns. In a monocentric urban form, urban density and distance to the centre are interlinked. These are also the dominant factors affecting commuting distance. In a polycentric structure, there are competing employment clusters within travel range, and thus the commuting patterns may vary more.
First the focus is on gravity functions of urban areas. The available origin-destination data on commuting enables the study of the attractiveness of the urban centre. Density gradients have been a common approach when estimating decentralization processes with monocentric models. In the analysis the gradient approach is applied to measure the commuting pattern originating from surrounding areas towards the centre.
Second part concentrates on commuting patterns in polycentric regions. Increasing travel range combined with a dense urban system induces functional polycentricicity in many European regions. However, the travel and commuting impacts of this developing situation has rarely been analysed on its own. The paper focuses on the structuring of commuting patterns of polycentric regions by means of mapping of interaction patterns, as well as comparisons of urban systems and commuting systems within three case study regions: Leipzig-Halle, Montpellier and Greater Manchester.
Finally we focus on dynamics of peri-urban commuting. Changes in the urban structure are particularly clear in the periphery of the cities. New patterns of settlement and employment require new patterns of mobility and transport. This study discusses the impacts of some general trends on peri-urban commuting. These trends include urbanization, increasing mobility, changes in accessibility, changes in employment patterns etc.

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Land Use Changes and the Mediterranean City – Urban Ecology face to face Urban Geography: A preliminary contribution

From the morphological point of view, several Mediterranean cities underwent rapid changes in the last century. Demographic dynamics transformed the impressive growth of the post-industrial period into the recent phase of deconcentration observed in many city centers followed by a spectacular spillover across the city region. The spatial organization of cities passed as well from the traditional compact model to a more dispersed urban form. This paper deals with this transition and its relationship with land use changes (LUCs) along the urban-rural gradient in two regions taken as paradigmatic examples of land use dynamics in compact mono-centric and poly-nucleated Mediterranean cities. LUCs occurred during 1960-2000 in Attica, Greece, and Rome province, Italy, were assessed by the analysis of long-term data at the municipal level and compared with information obtained from additional statistical sources. Changes in six basic land use categories (agriculture, pasture, forest, water, urban, and other uses) were explored diachronically by non-parametric correlation. Results put in evidence the impressive LUCs observed in the two regions since 1960. The analysis suggests that a substantial similarity in LUCs rate can be observed in Rome and Athens. Different patterns of LUCs were interpreted as driven by the traditional socio-economic and institutional drivers, and the contrasting geographical settings. The paper shows how comparative, diachronic analyses are particularly interesting when debating on the Mediterranean city and its socio-environmental relations with the surrounding territory. Environmental implications of both the 'compact' and 'dispersed' urban growth during 1960-1980 and the rapid urban spillover during 1980-2000 were explored. Prescriptions suitable to mitigate land fragmentation in environmental sensitive areas were finally discussed.

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Choosing agent types for a spatial decision support system for Auckland city

Spatial models are frequently used as decision support systems, tools to explore possible future developments of a city, region or country. Since these developments are driven by human action and interaction, Agent-Based (AB) approaches are a logical choice for simulating these processes, as agents are a very natural representation of actors that make decisions. However, it quickly becomes clear that the definition of agent-based in spatial modelling is broad and varies in the way decision-making bodies are perceived and represented in the model.

By some, cellular automata (CA) are considered AB models. They are by now commonly applied to address land use changes, and urban growth in particular. In CA models a location, represented by a cell, is considered the decision making unit, hence the agent. Recently, CA models have been expanded with more detailed information on the activities that are taking place on a location, such as its number of inhabitants, or the number of jobs. This addition to the CA framework is named Activity-Based modelling. This approach allows for incorporation of human behaviour, but agents are not yet units that make decisions themselves, as the amount of activity is still basically a cell property. In true AB approaches decisions are made by the agent, which is not bound to a certain location. Variants in this approach relate to the level of detail by which agents are represented. Agents can, for example, be used to simulate competition and interaction between environmentalists and farmers, where their interaction is global, and the result of the interaction is visible local. On a smaller scale, agents have been used to represent units that take their decision locally, such as families, companies or farmers. Finally, the closest one can come to approach human decision making is to simulate each individual as an agent.

This paper summarizes several types of agents that have been reported in spatial models and reviews their pros and cons for incorporation in decision support systems. Specifically, we examine what type of decision a specific type of agent can make, the scale at which this decision takes place, and the amount of information required to make this decision. This review is made in the context of a spatial decision support system for Auckland City. The aim of this system is to support long-term integrated policy development and planning in Auckland City by taking into account social, cultural, environmental and economic well-beings.

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MOLAND-Light: Supporting planners with a generic land use model for European regions

Despite the increasing interest the planners show in land use models, their actual use in supporting the planning practice is still limited. A frequently heard complaint is that tools are too difficult to use, since generally planners do not have a background in modelling and the calibration required to apply a model to their region. The usual modeller-centred operation of such tools, which does not discriminate between those parameters that are relevant for the planning practice and those who are mere internal parameters, distracts from the use of these tools to support integrated planning.
MOLAND-Light tries to bridge the gap between the MOLAND land use model and the planning practice. Its aim is to reach a large audience with a moderately complex model driven by a simple user interface. MOLAND-Light builds on the framework of the MOLAND land use model which uses a well established method known as constrained cellular automata. The total demand for each land use class is determined exogenously and the cellular automata algorithm allocates these land uses on the map.
MOLAND applications are calibrated specifically for a particular region and each application therefore has its own specific parameterisation. MOLAND-Light is generic in the sense that it uses the same model with the same parameterisation for all subareas of the targeted geographical extent (EU-27). To develop a generic rule set for all regions, MOLAND-Light was calibrated for selected case study areas, representing both urbanized and more rural areas, and independently validated for other areas over the same simulation period.
To ensure an easy access to planners, the user interface is simplified to those drivers relevant for planning and the calibrated applications are accessible from a web server that contains the model as well as all data and parameters. A user who wants to do a scenario study first selects a region of interest. For this region future population developments and area demands for selected land uses are defined. Then MOLAND-Light allocates these land uses on the map for each consecutive year, leading to a time series of maps of the land use developments and a set of socio-economic and environmental indicators, under the assumptions of the defined scenario.
This paper will describe the MOLAND-Light model, as well as the calibration and validation results for the generic rule set.

PLUREL

Topic 4

Rural-Urban Land Use Dynamics: Impacts on Resource Demand and Utilisation

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Modelling the consequences of urbanisation for the ecological capacity in European regions

European landscapes have been transformed considerably by urbanisation processes and this is likely to continue. Research results show that ecosystem performance (Tratalos et al. 2007) and biodiversity (McKinney 2002) decline with urban growth. The increasing degradation of natural spaces by fragmentation, isolation and homogenisation of habitats and consequential cumulative effects belong to the factors, which are considered to negatively influence ecosystems (Siedentop 1999; Theobald et al. 1997). Within the European Integrated Research Project PLUREL (Peri-urban land-use relationships), changing landscape configuration and fragmentation are subject to a comprehensive modelling approach in order to assess sustainability impacts of possible future trends of urban development in Europe (2015/2025) on the regional scale of NUTSX. NUTSX is a combination of the EUROSTAT regions nomenclature NUTS2 and NUTS3, so that the regions are of comparable size.
The objective is to develop robust statistical regression models, which describe causal relationships between urban land use as independent and landscape structure and land use variables as dependent variables. As a second explanatory element, regional socio-economic and geographical framework conditions are included in the modelling process as dummy variables. The variable data is derived from landscape analysis based on geographic information on land cover, infrastructure network and additional statistical data. The results of a Regional Urban Growth model (Rickebusch & Rounsevell 2009) are applied to our regression models, thus determining future states of ecological capacity of regions.
Although the regression models revealed a general low dependency of landscape parameters on the degree of urbanisation ($0.05 > R^2 < 0.68$), the integration of further explanatory variables of regional conditions enhanced the model quality significantly. It could be shown that there is a clear indication for a landscape development, which reduces ecological capacity. The application of the results from the urban growth model enabled the calculation of possible future values for landscape parameters in European regions. Consequently policy-makers can be provided with valuable information serving for decision support.

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Predicting the cumulative effects of local development plans in the peri-urban region of Milan, Italy

The cumulative effects of land use change at regional scale are often neglected in local level spatial planning decisions. Although local effects of urban development on natural, semi-natural and urban-fringe ecosystems have been shown having a negative interaction with biodiversity, water balance, biogeochemical cycles and microclimate, scaling up these results to assess the cumulative changes of these effects at regional level has been rarely done for strategic planning purposes. In presenting a case study on the north-eastern sector of the Province of Milan, this contribution aims to discuss a methodology to predict the cumulative environmental changes at regional scale of local spatial plans under alternative future scenarios, with the aim to support the procedure of Strategic Environmental Assessment (SEA).
The region represents one of the most urbanized and industrialised part of Italy, with significant urban pressures on existing protected areas and remaining rural patches, which are playing an important role in maintaining the regional ecological network and provide for several important environmental services, such as water balance and micro-climate regulation, recreation, and control of air pollution.
Firstly, relevant higher-level policies and main exogenous drivers of urban land use changes were identified (e.g. higher spatial and transportation policies, rural development regional strategy, transportation and housing preferences, etc.). Subsequently, alternative future scenarios were developed based on assumptions on those drivers and policies, and changes in urban land use patterns were simulated. Finally, regional cumulative effects of local urban developments (e.g. habitat fragmentation, surface runoff, human hazard, etc.) were detected and significant environmental processes driving these changes were further explored through a network analysis. This allowed to predict cumulative changes of alternative urban developments and assess them against a range of future scenarios. Spatially explicit models and indicators simulating relevant environmental processes, such as hydrological cycle, local surface temperature, were selected and computed starting from land cover data in order to quantify the combined effects at regional scale. Results are discussed and indications for local spatial planning presented.

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Natural resource management problems in peri-urban and urban areas – new dynamics of land use in coastal areas

The new EU-funded research project SECOA (Solutions for Environmental Contrasts in Coastal Areas) with focus on coastal metropolitan areas is the context for our review and synthesis of results from prior European research about rural-urban land use dynamics. We discuss results from the European projects RURBAN (for building new relationships in rural areas under urban pressure), BIOSCENE (about alternative forms of agricultural land use), CORASON (about rural sustainable development), and from other research, especially in Scandinavian countries. The guiding questions (connected to the ongoing SECOA-research) are: How is urban resource use demand and utilization (from various user groups) influencing the use of land, landscape and other resources in peri-urban areas? What are specific problems of urban-rural interaction in land and natural resource use in coastal areas? With examples from different countries in Europe we discuss rural-urban resource use problems in a broader and comparative perspective and with regard to knowledge synthesis. Knowledge synthesis in interdisciplinary coastal resource research includes different components – conceptual frameworks and theories (esp. social-ecological systems), methods for interdisciplinary land use research (e.g. geographical information systems/GIS, multi criteria analysis/MCA), empirical results about land use conflicts and conflict mitigation (esp. deliberative approaches), application of knowledge and cooperation with resource users and managers (see e.g. the transdisciplinarity discourse). For interdisciplinary research about land and resource use problems synthesis methods are weakly developed and method development for progressive knowledge synthesis is an urgent requirement. A main challenge for knowledge integration about rural urban dynamics of land use is to include as well material resources (material and energy use) as symbolic components (information, communication, valuation related to resource use). We conclude that new urban actors and interests of land use brought intensified competition on land resources, new land uses, changed functions and services of ecosystems, all of which require interdisciplinary knowledge integration to assess their effects.

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Accounting for urban metabolism in urban planning: The FP7 Project BRIDGE

Urban metabolism considers a city as a system and distinguishes between energy and material flows. "Metabolic" studies are usually top-down approaches that assess the inputs and outputs of food, water, energy, etc. from a city, or that compare the metabolic process of several cities. In contrast, bottom-up approaches are based on quantitative estimates of urban metabolism components at local scale, considering the urban metabolism as the 3D exchange and transformation of energy and matter between a city and its environment. Recent advances in bio-physical sciences have led to new methods to estimate energy, water, carbon and pollutants fluxes. However, there is poor communication of new knowledge to end-users, such as planners, architects and engineers.

Several studies have addressed urban metabolism issues, but few have integrated the development of numerical tools and methodologies for the analysis of fluxes between a city and its environment with its validation and application in terms of future development alternatives, based on environmental and socio-economic indicators for baseline and extreme situations.

The FP7 project BRIDGE (sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism) is a joint effort of 14 European Organizations aiming at incorporating sustainability aspects in urban planning processes, accounting for some well recognized relations between urban metabolism and urban structure. BRIDGE was launched in 2008 in order to assist urban planners to present and evaluate planning alternatives towards a sustainable city and aims at illustrating the advantages of considering environmental issues in urban planning. BRIDGE will not perform a complete life cycle analysis or whole system urban metabolism, but rather focuses on specific metabolism components (energy, water, carbon, pollutants). The project uses a "Community of Practice" approach, which means that local stakeholders (end-users) and scientists meet on a regular basis to share knowledge and experience. The end-users are therefore involved in the project from the beginning. Helsinki, Athens, London, Firenze and Gliwice have been selected as case study cities.

The innovation of BRIDGE lies in the development of a Decision Support System (DSS) integrating the bio-physical observations with socio-economic issues. It allows end-users to evaluate several urban planning alternatives based on their initial identification of planning objectives. In this way, sustainable planning strategies will be proposed based on quantitative assessments of energy, water, carbon and pollutants fluxes. The BRIDGE DSS will evaluate how planning alternatives can modify the physical flows of the urban metabolism components. The energy and water fluxes are measured and modelled at local scale. The fluxes of carbon and pollutants are modelled and their spatio-temporal distributions are estimated. These fluxes are simulated in a 3D context and also dynamically by using state-of-the-art numerical models, which normally simulate the complexity of the urban dynamical process exploiting the power and capabilities of modern computer platforms. The output of the above models leads to indicators which define the state of the urban environment. The end-users decide on the objectives that

correspond to their needs and determine objectives' relative importance. Once the objectives have been determined, a set of associated criteria are developed to link the objectives with the indicators. The BRIDGE DSS evaluates how planning alternatives can modify the physical flows of the above urban metabolism components. A Multi-criteria Decision Making approach has been adopted in BRIDGE DSS. To cope with the complexity of urban metabolism issues, objectives related to the fluxes of energy, water, carbon and pollutants, measure the intensity of the interactions among the different elements in the system and its environment. The evaluation of the performance of each alternative is done in accordance with the developed scales for each criterion to measure the performance of individual alternatives.

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Land use/land cover changes in the urban-rural interface in the Bucharest metropolitan area

Metropolitan areas must be considered as complex landscapes where different urban and rural elements meet and interact leading to new challenges related to land use/land cover changes. Most metropolitan areas face the growing problems of urban sprawl, loss of natural vegetation and open space. By its position within the Romanian Plain (southern part of Romania), Bucharest Metropolitan Area (BMA) is exposed to several environmental challenges as a result of the physical peculiarities of this relief unit as well as its man-made changes determining a radical transformation of the terrestrial cover and land use.

The paper is aiming to analyse land use/land cover changes patterns in the urban-rural interface experienced by the study area based on the investigation of the most representatively cartographic supports of the last century. The selected cartographic materials are aimed at contributing to a complex temporal analysis of the urban-rural interface in relation with the most important factors of change. Therefore, the authors identified as key factors two main categories: *before 1989 - the fall of the communist regime* (the main land reforms; the transition to the socialist agriculture and the collective property; the communist period with an intensive and extensive agriculture and increased industrialisation) and *the post-communist period* (the decolectivisation and privatisation of agriculture; the excessive land fragmentation; the uncontrolled urban sprawl; land use/land cover conversions and relocations, land abandonment etc.). The article is planning to put forward an historical overview of the land use/land cover changes in the urban-rural interface of the BMA in relation with the main factors involved in the patterns of change.

The authors are making use of different GIS methods based on a wide range of cartographic documents (old topographic maps, satellite images, orthophotoplans) realising a large geodatabase (raster and vector features) which will be analysed in order to determinate the *land use/land cover change range* and *trend index*. Therefore, the present study will combine GIS computer mapping techniques with housing and demographic data to identify the urban-rural interface changes in the BMA and understand causes of land conversion in order to predict how alternative policies will alter future land use change patterns.

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Strategies and Instruments for Shaping Urban and Peri-Urban Dynamics in Grand Casablanca, Morocco

Morocco's urban development is hitting hard upon the nature of agricultural production in periurban and rural spaces. Urban sprawl can be observed near to cities like Casablanca, Rabat, Marrakech, Fes, Agadir and Tangier but also within rural regions where urbanisation has been less dynamic. New towns have been built on fertile agricultural ground thus limiting not only the space available for alimentary production but also citizens' food security citizens. Morocco shows an urbanisation degree of 56,9% thus topping the worldwide average urbanisation rate of 50%. Moroccan cities will receive every year 500.000 newcomers or 123.000 households. Within one generation an urbanisation process more comprehensive than all other urbanisation achieved within the history of the country has to be managed. Urban dynamics acting upon periurban space of Casablanca represent an important challenge as concerns the coherency and balance of the urban development process for a future megacity, characterised by an ever growing need and consumption of space, driven by local and also international or global demand. Against this background scarce resources such as periurban space have to serve several functions, have to be multifunctional. This situation seriously challenges urban actors involved. Recently a couple of different tools and instruments for urban planning have been created:

- A master plan for national spatial development, approving the eminent role of Casablanca as locomotive of the national development.
- A national strategy for the promotion of small towns to facilitate rural migrants urban socialisation/insertion by maintaining linkages to their rural background
- Various strategies concerning: housing, cities without slums, new towns, and new zones for urbanization, environment chart, green plan etc.

All these approaches strive to improve modes of urban planning and to overcome the housing crisis. In addition, new research efforts by a German–Moroccan team of planners and scientists contributed to put agricultural and climate issues on the agenda of strategic planning. By analysing the impact of all these strategies against the background of urban, periurban and rural modes of social production and practices of space it will be shown that radical structural changes will be necessary in Grand Casablanca. As a result, new frontiers and conflicts regarding the nature of urbanisation will emerge; periurban space will be devoted not only to housing and tertiary use but also to multifunctional purposes thus preparing the stage for new modes of protection of valuable land to maintain agriculture, food security and a healthy environment.

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Urban-rural interaction patterns and dynamic land use: Further thinking for urban-rural integration in China

There are two misunderstandings toward urban-rural integration strategy in China: first, urban-rural integration means making urban and rural areas the same (e.g. convert villages into cities); second, urban-rural integration means integration of industrial layout between urban and rural areas (e.g. vigorously develop rural industries). All these apprehensions have led to policy failures and severe resource waste. In fact, the fundamental aim of this strategy is to break the institutional barriers and establish a mechanism of "industry supporting agriculture and cities supporting the countryside". The core for this strategy is to strengthen urban-rural interactions. It is generally accepted that urban-rural interaction is the flows of material, capital, people, information and technology between urban and rural areas. However, China is a country of vast territory and distinct regional differences. Thus, urban-rural interaction in different places presents various features which call for differentiated ways to achieve urban-rural integration.

The aims of this paper are: (1) to analyze patterns of urban-rural interaction in China and the dynamic land use in urban-rural regions; (2) to propose variant ways of achieving urban-rural integration. The paper identifies four types of urban-rural interaction in China: urban-oriented interaction at the peri-urban areas which exists in almost all the cities; small towns of flourishing economy which includes non-farm industries and strong agricultural economy; those remote or mountainous areas of backward economy which mainly relies on laborers' working in cities; urban-rural interaction in city-regions. By referring to case studies, dynamic land use patterns are also presented in terms of each urban-rural interaction type. Then, the paper proposes variant routes to achieve integration between urban and rural areas based on the features of each urban-rural interaction pattern. The stressing points lie in the reforming of household registration system, fiscal system, tax system and social welfare system between urban and rural areas. The conclusion emphasizes the importance of adopting distinct ways of urban-rural integration in China of diversified context.

The paper puts forward differentiated ways of achieving urban-rural integration in China on the basis of different urban-rural interaction patterns. The research of this paper contributes to both the understanding and implementation of urban-rural integration strategy in China.

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Peri-urban municipality structure as a competitive environment triggering accelerated settlement growth – patterns, effects and solutions promoting sustainable peri-urban development

National planning policies define the spatial extent of the planning power ranging from national, regional to highly local influence. The investigations on national planning policies within the PUREL project provide deep insights regarding the range of centralized or localized rights to define planning guidelines. It appears that in the majority of the EU27 countries, communities have the right to decide about land use development promoting settlement extension by providing new building land and moderate planning restrictions to control settlement growth. This aspect accelerates the peri-urban dilemma: on the one hand, the urban core municipalities are interested in keeping their economic and population growth and want the peri-urban surroundings to remain green and clean, serving as ecosystem service providers and resource suppliers; on the other hand, the municipalities in the peri-urban area are interested in gaining their own population growth and economic prosperity by competing with neighbouring municipalities and gathering a share of the growth dynamics within the rural urban region. If the responsibility for settlement development rests upon authorities at the local level, a competitive situation evolves which speeds up peri-urban development in an unsustainable way.
Municipality structures in Europe differ between countries, which might be the cause of the different peri-urban land use structures and population density pattern observed. Here, we assume that peri-urbanization acceleration depends (aside from national planning policies) mostly on the number and size of municipalities in the peri-urban region. These act as an antipole to the urban core, which on the one hand allows settlement growth outside the line of regional authority development targets and on the other hand forces regional and national authorities to provide new transport infrastructure – roads and public transport - required by the new inhabitants settling into the urban core outskirts and peri-urban surroundings.
To verify these assumptions, the number and size of the municipalities in the peri-urban and urban core areas will as well as the national planning policies be explored and related to the share of urbanized area in the rural urban regions – today and in the future. For this we will use the RUR sub-region delineation, the PLUREL scenario results and the RUG model output, providing spatially explicit estimations of the share of artificial surfaces and population numbers, and the planning policy investigations regarding planning power distribution.
The different effects observed in the RURs and their peri-urban sub-regions in the EU member states will be presented and the consequences will be discussed, as well as solutions for achieving a more sustainable development of peri-urban settlements.

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Will the best agricultural land in the Municipality of Koper be overbuilt?

Slovenia, as a transitional country, faces extreme pressure of capital on land. In the last 20 years, we have lost 68,800 ha of agricultural land in use, which is 12 % of the total agricultural land in use in total, even though we have a system of protection of the best agricultural land, established in the 80s. There is now only 2415 and 884 m² of agricultural land in use and arable land per person in Slovenia, respectively. According to the system of agricultural land protection, land in Slovenia is divided into eight categories, based on soil properties, elevation, inclination and actual use. Arable land on the most fertile soil, permanent crops, parcels in bigger complexes, and parcels with any infrastructure (i.e. irrigation, drainage) belong to the category of the best agricultural land, which has obviously not been protected very efficiently from land use change, perhaps also because the designation of land into best agricultural land has not been a very exact one. Municipalities in Slovenia have recently prepared new spatial plans. The actual system of spatial planning enables individuals to put initiatives for new building constructions in local spatial plans.

The Municipality of Koper (MOK), which is one of the case studies in the project PLUREL, has 6000 initiatives for new building construction, which is a fairly high number for the area of MOK (311 km²). The pressure for new building constructions is higher than in other parts of Slovenia, due to being on the coast. In addition to the desire for owner-occupier housing, there is also a desire for new tourist accommodation (apartments) and weekend houses for people from the central part of Slovenia.

The high number of initiatives represents a real threat to an important agricultural natural resource. Within PLUREL, stakeholders from MOK defined the pressure on agriculture due to housing as one of three important issues for the region. The aim of the research is to analyse: (1) how much of the most fertile soil really belongs in the category of best agricultural land, which should be most protected, (2) how much of the most fertile soil in the Municipality of Koper is threatened by the proposed building initiatives, (3) what is the influence of some natural factors (e.g., distance from the city centre toward the hinterland, inclination, elevation, etc.) on the number and density of initiatives and (4) what is the relationship of building initiatives and the most fertile soil with the previously mentioned factors.

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Travel Related Zones of the Urban Form - Case Peri-urban

Urban form affects sustainability significantly, but there is a lack of consensus, how to measure the effects of urban form. In Finland Finnish Environment Institute and Tampere Technical University together with urban and transport planners have developed a method where urban region is divided into zones according to their location in the urban form and their public transport supply. The zones are pedestrian, public transport and car oriented zones. Zones cover also peri-urban region.

Research data of travel related urban zones is based on GIS based land use information and travel surveys. Urban form elements like density, morphology, mix of land use etc. has been analysed using high resolution GIS data generated into 250 x 250 meters grid cells. This resolution makes it possible to utilize Finnish Monitoring System of Urban Form and Spatial Structure including variety of statistics of urban form in 1985-2007. The information about travel behaviour is based on large travel surveys.

Empirical analyses have been conducted to find out thresholds of changes in the urban form as an evidence to travel behavior, e.g. mode choice and trip length. An example is the population density in which specific urban zone will change from "one car household" to "multi-car household". Also travel related greenhouse gas emissions per inhabitant have been assessed to each zone group. The method provides also information concerning the factors affecting the daily travel choices. The method of the peri-urban zones has been applied in many urban regions in Finland. A key research question is, how frequent the public transport supply has to be and what element urban form should contain to be able to avoid car dependency in peri-urban zones.

The object of the zonal approach of urban form has been to refine the land use and travel behaviour data for the purposes of land use and transport system planning. The latest case area has been the metropolitan region of Helsinki including the commuting area of the region. Urban zones have been applied as a planning method is used in the Uusimaa Regional Council strategic land use planning process. In the strategic land use plans the zonal division has been constituted for different land use scenarios of year 2035. The next step is to compare Helsinki metropolitan region to international metropolitan regions using the same method.

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A land use policy shocks in the Estonian urban fringe

While Western Europe reached already re-urbanization phase, in Estonia, similarly to other Central and Eastern European (CEE) countries, since the late 1990s the cycle of urbanization had turned from urbanization to suburbanization with major implication in land use (Tammaru et al., 2004; Kulu and Billari, 2006; Pichler-Milanovic et al., 2007). Land use modelling is deployed for tracking suburbanization processes, to provide information and enhancing standards for land use planning in the urban fringe tested in the Tartu case study. Since the turn of the millennium new residential estates, sporadic plots and infrastructure projects have occupied the cultivated fields at the city's perimeter, near suburban agro-villages, along major roads; and at garden allotments and summer-house districts. The majority of new developments remain poorly planned and designed, in many cases without any matching with comprehensive planning and master planning. Suburbanization, in particular in the form of urban sprawl produces functionally homogenous zones. On average, 12.2 dwellings were designed and planned per a master plan (293 dwellings per km2). There is a strong relationship between the distance from the Tartu city centre and the size of master plan area. Development, in spatial terms usually patchy and scattered, is characterized by discontinuity, leaving a lot of empty spaces, which indicate the inefficiencies in development and highlight the consequences of uncontrolled growth. In the first half of 2000s, the shape of the fringe neighbourhoods has been strictly tetragonous, followed by the semi-curvy, cul-de-sac pattern of suburbs decreasing of edge density of settlements from 0.032 to 0.026. Uncoordinated land-planning mechanisms at municipalities are the main sources of the environmental and socio-economic unsustainability in the suburbanizing areas. While conservative councils used their administrative power to enforce tighter controls on land use to continue mainly agricultural uses, as in the case of Tahtvere, less strict municipalities employed their new ability to modify planning codes to lure real estate developers, as in case of Ulenurme. Too much emphasis was given to the delivery of quantity, namely land supply rather than the benefits of quality and allocation choices during the growth phase. The recession has changed land use policies. The evolution of land use planning practice and deficiencies of institutional framework are discussed to promote sustainable land use in the Estonian sprawling suburbs.

Grzegorz Siebielec, Artur Lopatka Error! Bookmark not defined.**, Tomasz Stuczynski, Malgorzata Kozak, Magdalena Gluszynska, Joanna Koza, Anna Zurek**
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Analysis of soil protection effectiveness in cities of central Europe

Role of soils within urban areas is not limited to production function and ground for constructions. Urban soils fulfill numerous functions ensuring ecosystem balance and quality of life for the human population. High quality soils have high meaning for microclimate, biodiversity, flood prevention, dust reduction, filtering and buffering of contaminants or even keeping aesthetic functions of space and menthal health of the population through creation of human-friendly areas.
The presented analysis, performed within URBAN-SMS project, was aimed at assessment of correlation between soil protection regulations and loss of valuable soil resources in Central Europe cities. The following cities served as pilot areas: Stuttgart, Vienna, Wroclaw, Prague, Bratislava, Milan and Salzburg. Land use change trends were based on classification of time series of satellite images. For this purpose 10 m resolution SPOT images, taken in 1992-1993 and 2006-2007, were used for development of land use maps. The land use classification was basically performed in Definiens Professional software. Using the satellite data from the same source and period was required to ensure consistency of land cover data and allow comparability of results between cities. Information on land use change were superimposed on soil maps of the cities in order to detect to what extend urbanization took place on valuable soils (either from perspective of production function, ecosystem function, buffering, retention etc.). The soil layers were provided by the respective project partners. For most of cities the national soil quality classification systems were used to assess consumption of valuable soils. In case of Prague soil typology, and in case of Milan soil texture were utilized to discriminate soil quality classes. A simple conversion index was used to characterize the intensity of transition of different soils to artificial areas (percent of soil class in newly urbanized area/percent of soil class in whole urban area). The area sealed within last 15 y ranged between 160 and 900 ha. Mostly arable lands were taken for urbanization, however in some cities seminatural areas were consumed. The assessment revealed different trends in management of valuable soils between the cities, partly related to level of soil protection in national legislation.

PLUREL

Topic 5

Quality of Life and Ecosystem Services in Rural-Urban Regions

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The peri-urban zone and the quality of life of city dwellers: recreation as (missing) link

The peri-urban zone is becoming more important as an area where city dwellers go for outdoor recreation. But how important is it precisely, and are all of its parts equally important? Does it fulfill its recreational function in a satisfactory way, or are improvements desired? The answer to such questions may help policy makers to better include the recreational function in sustainable planning for this zone. Accommodating the recreational needs of citizens is important because it contributes to their quality of life. Needs that are not met locally may also lead to undesirable behaviour, such a more leisure mobility or less physical activity. Furthermore, by increasing the connectedness with the peri-urban zone, recreational use builds social support for preserving the landscape in this zone.

At the moment we are working on an instrument that should indicate whether the peri-urban zone accommodates the recreational demands of nearby city dwellers, which parts contribute most and which parts might or should be changed. We build on an already operational method for confronting the local demand for with the supply of green space for recreational activities. Thus far the method is quite quantitative: it ignores the qualities of the local supply. It also does not differentiate between population segments with different needs and desires. So the objective is to refine the existing method by taking desired and available qualities of the recreational opportunities into account.
As a first step, the local supply was qualified with respect to the opportunities it offers for the much sought-after experience of peace and quiet, a. A destination area is thought to facilitate such an experience to the extent it differs more from the built-up environment, is more natural, less crowded and less noisy. The quantitative demand and supply confrontation was used to indicate quiet. Other existing models were used for scenic beauty, with naturalness playing an import role, and noise level. Each indicator was validated separately, based on a large scale survey, by comparing indicator values with respondents' ratings for the corresponding aspect. An overall score for restorativeness was constructed by averaging the aspect ratings for scenic beauty, quiet en silence. This restorativeness score could be predicted quite well by the three GIS-based indicators (high explained variance). Based on the regression equation a national map was constructed.

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Ecosystem services as a factor for increasing of quality life in rural-urban regions

In the perceptions of many people, the environment and landscape have been, and still often are, minor parts of the socio-economic system, whose management is frequently in conflict with regional development, both in spatial and purely economic terms. Investigation of the link between being green and being successful economically has thus been a core topic from the spatial management point of view. Today's environment is having a value attached to it – inter alia through assessment of its potential to generate energy, to supply biotic resources and to satisfy people by way of its possession of valuable landscape features. In short, it is being treated as an important factor behind regional economic development, joining with the economic and social factors in determining directions that development is to take, ways in which it is to be achieved, means of implementation and consequences.

Today the environmental economy is associated with a diversity of views on the economic impacts of ecosystem services and pro-environmental investments, particularly those associated with the protection of the environment and the landscape and the effort to maintain or raise an area's attractiveness. In line with the model for the attainment of economic success as set against outlays on the protection and optimal utilisation of environmental resources, there are three possibilities through which relations between outlays and obtained effects are likely to be shaped. Each of the presented solutions has its advocates and opponents. However, precise analysis of the solutions makes it clear that all of them are possible, the actual economic effect obtained being dependent on a series of conditioning factors both endogenous and exogenous.

In constructing a model for outlays on the environment as against economic success in rural-urban regions, it is necessary to determine also the so-called maximum incremental social tolerance irreversible costs (MISTIC) index, since this provides for an assessment of the level of readiness in society (not least in its organizations introducing green solutions, if often only at great expense).

The aim of the presentation is offer a new view on the environment and its role as regards regional development in rural-urban area, as well as to assess environmental conditions as factors potentially underpinning new spatial patterns. Also, it points out the multifunctionality of nature space to creating new challenges for regional policy in quest for attracts and viscosity of the rural-urban regions.

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Valuation of Terrestrial Ecosystem Services in a multifunctional peri-urban space (VOTES)

Costanza (2000) recognizes that, in order to conduct appropriate valuation of Ecosystem Services, one needs to address the question: who votes? Is it Homo economicus, communicus or naturalis? Costanza further argues that in doing valuation of ecosystem services, we need to consider a broader set of goals that include ecological sustainability and social fairness, along with the traditional economic goal of efficiency. The VOTES project therefore intends to perform an integrated assessment of ecosystem services for a case study area in peri-urban central Belgium, by taking into account the three pillars of sustainable development: economy, society, and environment. The novel aspect of the proposed research is that it aims to do so in a spatially and temporally explicit way using state-of-the-art scenarios of global change downscaled to the study area. Among the components of global change, land use change has been identified as one of the main pressures on ecosystem services and biodiversity (Turner et al., 1997; Lambin et al., 2001). This is particularly true in Belgium where limited land surfaces are subject to intense competition for their uses. Scenarios of land use change developed in two other projects (i.e. the belgian-funded MULTIMODE and EC-funded ECOCHANGE projects), taking into account climate and socio-economic changes, project large amount of change in land use over the coming decades. This is especially the case in peri-urban areas where pressure from urban development is the highest. Consequently, the size and distribution of the agricultural, semi-natural and forest ecosystems are expected to vary dramatically hence affecting the ecosystem services they provide, suggesting the need of an integrative, multi-ecosystem approach to look at changes in ecosystem services. Based on the outputs of the previously cited projects, VOTES aims at quantifying the importance of key ecosystem services for a case study near Brussels (within the river Dyle's catchment, around Leuven) by integrating social, biophysical and economic valuation. The project investigates how these values are likely to change under the above-mentioned scenarios. The issues of trade-offs, transfer, communication and distribution of ecosystem services will be examined under economic, social and environmental perspectives with the local community and stakeholders. Development of new and/or adaptations to existing policy instruments, which implement the developed methodology into decision-making processes will be suggested. A more detailed methodological framework and preliminary results will be presented during the workshop.

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Integration and trade-offs between urban ecosystem services in rural-urban regions

The concept of ecosystem services deals with the benefits the society and each single resident gains from natural processes and ecological functions. It focuses predominantly on the resource and functional aspect of landscapes. In terms of urban (land use) systems, ecosystem services assessment is hindered by the fact that we have a full range of overlaying ecosystem services in the multifunctional urban landscape. Thus, they might support but also impair each other. In our paper, we will discuss different ways to integrate different ecosystem services for an urban region and an approach to determine trade-offs between urban ecosystem services. So doing, eight ecosystem services have been selected: (1) Local climate regulation, (2) global climate regulation, (3) recreation, (4) water quantity regulation, (5) biodiversity, (6) food provision, (7) energy provision, and (8) fresh water provision. The paper further scrutinises both potentials and problems the integration study was encountered with.

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Anti-urbanisation as development chance for rural areas. In-migration and self-employed business in the countryside around Copenhagen

Anti-urbanisation is a form of counter-urbanisation, which means migration from the city to the countryside. Three variants can be distinguished by the motives of the migrants: A search for a radical often self-sufficient lifestyle, a relocation to enhance one's quality of life and amenity driven retirement migration. In the region around Copenhagen such life style related migration to more peripheral areas can be detected counting especially the middle-aged and retired groups. Their migration is amenity-driven as they are attracted to coastal areas and rural amenities. They are also searching for a less stressful life, freedom and peace and quiet; a better quality of life. Anti-urbanisation might be a development chance for more remote areas in the metropolitan region. Some in-migrants start a micro-business in knowledge or creative services at their new home in the countryside in order to combine a dwelling far from the city, life style considerations with a continued carrier.

By statistical analysis based on age-related migration data for municipalities we studied the extent of anti-urbanisation in the case area. The data indicates an ongoing and amplifying trend of amenity-driven migration into rural areas in the last 30 years regarding middle-aged and retired groups. By qualitative interviews we further studied a specific group of anti-urbanits, namely persons relocating for quality of life reasons and starting an own micro-business. They are self-employed also after some years in the countryside as they want to be flexible and have the freedom to enjoy the rural amenities. Quality-of-life issues seem to out-balance the difficulties for business in rural areas. Most businesses have gone through many changes especially to minimize commuting to urban areas and have put much effort into building up regional networks of similar businesses. Some businesses have not been able to adapt. The successful businesses combine few well established customers and networks in the city with a broader array of services matching a regional market, indicating a sustainable integration of those anti-urbanits in the rural area.

To attract and hold the life-style migrants in the area different factors are important. We will discuss implications of anti-urbanisation and the opportunities and challenges for rural municipalities and how to support a sustainable integration of those.

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Megacity Casablanca - a rural-urban region

Megacity Casablanca - a rural-urban region
The Casablanca region - in Arabic "Dar el Beida" - is the largest and most densely populated area in the Kingdom of Morocco. Casablanca is the economic engine of the country. Within a mere hundred years, Casablanca grew from a small settlement of 20,000 inhabitants to a metropolis of 4,6 million.
The UAC research project
The BMBF inter- and transdisciplinary megacity-research-project operates within these parameters, lead by the Berlin Institute of Technology. The project´s aim is to examine and analyse to what extent Urban Agriculture can make a relevant contribution to climate-optimized and sustainable urban development as an integrative factor in urban growth centers.
Urban rural lingkages
One of the starting point is to understand landscape as a constructive urban element and to ask whether and in what ways a lasting integration of multifunctional open-space systems can be realised within the dynamic of urbanisation. In the process, the focus is on the use of the potential of open spaces. Alongside classic functions such as recreation, the project concentrates on other ecological, social and spatial functions surch as water-reuse systems or active risk management. The central questions are: What can landscape do for the city? What can the city do for the landscape? What are the synergy effects that can be generated and exploited? How can urban mining processes be initiated and optimised?
The concept of the rurban - a new type of living environment
The identification of the potential spaces for productive landscapes is undertaken from several different perspectives. An important basis to understand the mechanism of spatial space production is knowledge of agricultural spaces, their different inhabitants, their practices, productivity and soil quality, but equally how they are percieved and valued within the region. The aim is to develop agricultural areas with different characteristics into a productive, multifunctional green infrastructure. This spatial system is to be understood not merely as an infrastructural functional space, but also as a working and living environment for a portion of the urban population. In the process, the focus rests on today´s peri-urban areas, meaning that urban farmers become spatial producers of a new urban milieu - the rurban. A intensive discussion about the posible synergies between the city and agricuture opens up new avenues that are treated in a paralelel process using different references of scale - defined as the macro, meso, an micro levels (e.g. scenario work - session 2)
The conceptualisation of urban agriculture in the rurban milieu offers a potential approach to the development of new, better quality and more sustainable forms of living.

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Transformation of housing patterns in the urban-rural fringe of the metropolitan area of Warsaw

The concern for urban-rural cooperation in Europe originates from the international debate on polycentric development of the European territory, started in the 1980´s with the publication of the European Regional/Spatial Planning Charter. Those initial concepts, followed by the provisions of the European Spatial Development Perspective, resulted in a comprehensive investigation of the urban-rural relations carried out by the European Spatial Planning Observation Network (ESPON) at the beginning of the present century. In this presentation, the urban-rural relations are studied in view of their influence on residential development. Following the methodology developed by ESPON, the research is aimed at understanding the relation between the level of urbanity/rurality of a territory and the transformation of the housing patterns in that territory. The concept of housing pattern is understood both physically (living space) and socially (way of living, lifestyle). The scope of research comprises residential developments planned and constructed within the metropolitan area of Warsaw in the last two decades of the economic transformation in Poland. In order to address the research problem, two complementary analyses are being carried out: the macro-scale study of the whole metropolitan area and the micro-scale study of a number of different housing patterns. The first analysis is based mainly on statistical data and is focused on quantitative aspects of the residential development in the studied area. The second one is aimed at qualitative assessment of a series of representative patterns with the use of the multi-case study method. The results of the research are expected to confirm the existence of a logical relation between the level of urbanity/rurality and residential development. The appearance of transition areas between the city and its rural hinterland induces uniformity of the housing patterns and thus results in reduced diversity of residential options in the urban-rural fringe.

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A rural-urban gradient analysis of ecosystem services demand and supply dynamics

As the majority of the human population is located in cities, urban regions are the focal places of human ecosystem service demands and, simultaneously, the primary source of global environmental impacts. Not only is the number of urban dwellers increasing constantly, but also the resource consumption per capita. This leads to an increasing dependency of urban regions on imports of materials and goods such as water, food, and fuel. Although specific ecosystem services directly contribute to the quality of life in cities, increasing imports of essential goods and services in the course of globalisation assure the independent growth of today's cities from the ecological constraints of their direct rural hinterlands. However, cities still depend on their direct hinterland for the provision of water, the most important and largest material flux into urban ecosystems. Therefore, and because of the export of ecological degradation to remote regions, the comparison of ecosystem services demand in urban regions and the corresponding supply of their rural hinterlands provide important arguments for managing resource metabolism and establishing sustainable policy strategies. However, investigations of the relationship of ecosystem services demand and supply including their particular spatial patterns in rural urban regions are quite rare.

Set against that background, we present a method to quantify and map both supply and demand of four ecosystem services - energy, food, water, and carbon sequestration - in the eastern German urban region Leipzig-Halle, which has experienced significant socio-economic dynamics and land use changes after the German reunification in 1990. In order to consider the impacts of urban sprawl, land use changes and socio-economic dynamics in the rural-urban continuum, the rural-urban gradient approach has been applied. We identified an increasing supply/demand ratio of food and water but a decreasing supply/demand ratio of energy. Besides, the pattern of ecosystem demands shows a leveling of rural-urban gradients, reflecting profound modifications of traditional rural-urban relationships. Urban sprawl did not clearly impact the supply of ecosystem services, e.g. food, emphasizing the fact that land use intensity changes had a more important impact on ecosystem service supply than changes in land cover, such as the decrease of agricultural area.

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To the Great Outdoors

There is an indirect link between location choice and landscape quality, as the availability of knowledge workers is an important factor in the knowledge economy. Knowledge workers have high standards for quality of life, and urban green, recreational options and landscape quality are elements of Quality of living. This study explores the link between the location choice and urban green, the countryside, nature areas and options for outdoor recreation and other aspects of landscape quality. It also explores how important these 'green' factors are compared to other aspects of Quality of Living.

The core of the study is a survey among 229 international knowledge workers in three Dutch regions which are popular with international knowledge enterprises: the area around Amsterdam, The Hague and Eindhoven. We gathered information from expats on their preferences for parks, the countryside and nature areas and outdoor recreation options. The main outcome is that expats consider green in the direct living environment as an important element of quality of life.

Expats consider local Quality of Living as important in their decision to accept a job. The most important dimensions of Qulity of Living are Nature & Environment and the Socio-cultural domain. Walking and cycling are the most popular recreation outdoor activities among expats. Running, jogging, ball games are often mentioned as favorite activities. There are no special facilities required for these activities. What is needed for walking and cycling are high quality green networks in cities, with good connections to the countryside around the cities. Very few expats are interested in golf and 'extreme adventure sports'. Missing features in the Netherlands are urban parks, nature areas, hills, space and wilderness.

The outcomes of the questionnaire were used in landscape design workshops in the Amsterdam and The Hague region. The creation of attractive green living, working and leisure environments can improve competitiveness of regions in the race to attract worldwide operating knowledge enterprises.

Henning Sten Hansen
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Assessing the impact of afforestation on accessibility to forest areas as a recreational resource

Afforestation of former arable land may serve many purposes and provide many benefits to the environment - including carbon sequestration, reduced nitrate pollution of water, and restoration of biodiversity. Besides, afforestation provides recreational opportunities for people, in particular where new forests are close to urban areas with little old forest present. There is also increasing realisation of the benefits of forests for the health and quality of life of citizens.
The forest area has been steadily increasing since the end of the 19th century, and from 1990 to 2006 the Danish forest area increased from 10.3% to 12.4% of the total land area. Due to the many benefits mentioned above the Danish national forest strategy from 1989 aims at doubling the forest area within a 100 years period and thus covering 20 – 25% of Denmark at the end of this century. Experiences have shown that economic incentives are a prerequisite for afforestation on privately owned land. Future subsidised afforestation efforts will continue to prioritise size, continuity with existing forests, localisation, landscape considerations and proximity to urban areas. The result was a division of the Danish area into three categories regarding afforestation: a) highly subsidised areas, b) partly subsidised areas, and c) prohibited areas.
The aim of the current research has been to assess the impact of the future afforestation activities on the accessibility to forest as a recreational resource. The first part of the project aimed at making land-use simulations of the future expansion of urban and forest areas for two different scenarios for urban development and two scenarios for afforestation. The first scenario for urban development assumes a centralised urban development whereas the second scenario describes a decentralised urban development. The first afforestation scenario assumes the planned doubling of the forest area, while the other scenario assumes a less optimistic 50% increase of the forest area towards year 2100. All together this gives rise to 4 different simulations. All simulations are performed with the LUCIA land-use change modelling framework and the simulation period was 2010 to 2050. After having made the simulations we calculated the number of hectares residential area within 10 different distance zones from forest for the start and end year of the simulations. The impact on accessibility to forest was assessed by calculating the change of accessibility between 2010 and 2050 for all distance zones, and the assessment was carried out for all four scenarios.

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Above-belowground linkages as affecting nitrogen dynamics in urban soils

Transformation of soils to urban use is known to pose drastic effects on the physical, chemical and ecological characteristics of urban soils, which are likely to hamper the important ecosystem services produced by belowground biota. The use of plants in improving/restoring soils is a well established practice in various disturbed ecosystems, but the knowledge of the ability of primary producers to modify urban soils is virtually lacking. To explore the effects of aboveground plant manipulation on belowground biota and soil processes we established a field and laboratory experiments using four plant species/ functional types: legume (Lotus corniculatus), grass (Holcus lanatus), coniferous tree (Picea abies) and heather (Calluna vulgaris). The 2.5 -year long field study applying pan lysimeters to collect water leachates from the rhizospheres was conducted at two urban sites with differing soil characteristics. Plant species producing labile litter (Lotus and Holcus) produced a higher bacterial energy channel biomass in comparison to plants (Calluna and Picea) producing recalcitrant litter.

The bacterial-dominating energy channel under Lotus plots leached higher amount of inorganic nitrogen than the plots with Calluna & Picea, the latter having relatively higher proportion of fungal biomass in the soil. However, Holcus plants, albeit increasing the bacterial biomass, also showed a high capacity for conserving nitrogen in the soil.

Further, we tested the ability of the different plant types to sequester added nitrogen to their biomass in a laboratory experiment. Although Holcus was effective in retaining the inorganic nitrogen in the soil, Picea had a highest nitrogen sequestration potential of the studied plants. Interestingly, moderate nitrogen addition (simulating annual N deposition rate of Southern Finland) to nutrient-poor mineral urban soil decreased the PAH (phenanthrene) leaching losses from all plant-soil systems. N addition enhanced the PAH mineralization especially in Picea soils, which we considered as a direct stimulatory effect of N on Picea rhizosphere microbes. Microflora under Picea plants has adapted to degrade litter compounds structurally similar to PAHs.

Our study demonstrates the great potential of plant species (or functional types) to modify the urban belowground communities and consequently, the dynamics of nutrients and contaminants in disturbed urban soils. Urban green space planning should take into consideration the potential of plants of various functional traits in modifying ecosystem functions of urban soils.

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'Quality of life' under pressure in peri-urban areas: who are the culprits?

The aim of pro-active spatial planning is to allocate land uses so to avoid land use conflicts as much as possible, hereby contributing to residential quality of life. The necessary knowledge for this task, however, is often precluded due to the complexity of land use conflicts. A typology of land use conflicts may uncover a systematic order and general processes that transcend individual differences between conflicts and thus help to reduce this complexity.
In order to create such a typology this study utilizes a land use conflict model which is based on the concept of landscape services: peri-urban landscapes provide multiple goods and services (for simplicity reasons hereafter only referred to as services). The externalities of some of these services may trigger land use conflicts if they negatively affect other services. For example, the service of recreation (e.g sports ground activities) may trigger a land use conflict if the associated externality of noise (e.g. shouting and cheering) negatively affects the nearby service of residential housing.
Based on this model an empirical survey was conducted in a densely populated peri-urban area of Aarau, Switzerland. Using newspaper articles a total of 164 land use conflicts were recorded for a period of three years (2007-2009). For each conflict the trigger service, its associated externality, and the affected service were recorded.
The externalities involved were chosen as the main distinctive feature to base the conflict typology on, as their variability was greater than that of the trigger and affected services. Using cluster analysis 6 preliminary conflict types have been identified:

1. Health hazards (non-ionising radiation, ...)
2. Visual blight (unappealing changes to the landscape or townscape)
3. Noise pollution (traffic, ...)
4. Preservation-of-the past (demolition of old buildings, ...)
5. Ecosystem conservation (habitat protection, ...)
6. Society/lifestyle (profound changes to the established neighbourhood)

Work on this project is still in progress: upcoming analyses of the preliminary conflict types will further advance knowledge on how land use conflicts affect residential quality of life. Already, "Noise pollution" has been identified as the most frequent conflict type. Also, the number of articles per conflict is being considered as a surrogate for conflict intensity, which makes "Health hazards" the conflict type with the highest intensity.

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Assessing the development of outdoor recreation in the urban-rural interface in Beijing, China

The urban-rural interface can provide many important services to urban dwellers and outdoor recreation is one of them. In this study, the trend of outdoor recreation in the urban-rural interface in Beijing was studied using a comparative method. The factors that contribute to the movement of center of outdoor recreation from city parks to the urban-rural interface were analyzed. Typical outdoor recreation facilities and their visitors in the urban-rural interface were investigated. The different stages of development in Beijing were compared to those in New York City and Chicago. The result shows that the spatial expansion of outdoor recreation in Beijing is significantly influenced by the car ownership and the dispensable income. The development of outdoor recreation in the interface can be divided into three periods, prior to 1990, 1990-2005, and 2005-now. Most recreation activities are now happening in areas with a radius about 40 km from the city center. The development of outdoor recreation in Beijing share many similar features as those in large American cities in 1960s. We suggest that lessons should be learned from those American cities. Proactive planning and management measures need to be taken to satisfy the ever-increasing demand for outdoor recreation and reduce the negative impact on the environment in the interface area.

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Moving or staying – understanding how quality of life is affected by land use change, using residential choice as a mechanism.

This presentation results from work within the project PLUREL, from the FP6 Priority 6.3 - Global Change and Ecosystems. It has been developed in the working module carrying out impact assessment for sustainability dimensions under specific land conversion scenarios.
In search for adequate social indicators that would reflect how land use change (LUC) affects urban-rural residents' Quality of Life (QoL), the approach adopted here was to focus on pre-existing indicator lists proven to be sustainable, selecting a limited set from them.
It was decided that residential location preferences by different resident types in urban, peri-urban, and rural areas would be a suitable means of assessing the possible impact of these changes on QoL.
As such preferences depend on a series of personal and perceptual factors, from a given set of QoL indicators, each would be valued differently by different people under different circumstances. One given place would, therefore, "afford" different things to different people, hence the concept of "affordances" in the theoretical grounding of the present study.
Studying preferences so as to offer the possibility of predicting choice behaviour according to changes in the land use scenario was chosen as the method, for which Adaptive Conjoint Analysis (ACA), was selected as the appropriate tool. ACA is one of a group of statistical techniques for measuring the relative importance of choice attributes when considered jointly, based on trade-offs using choice exercises.
ACA requires the definition of the components of choice scenarios in terms of attributes, e.g. 'air quality', and levels of each attribute, e.g. good, fair, poor etc. Hence, for the Adaptive Conjoint study used here, eight QoL indicators were selected as attributes from the initial sets reviewed and broken down into appropriate levels. The selected indicators were: air quality, access to green spaces, access to public transport, presence of shopping facilities in the neighbourhood, noise pollution, dwelling suitability, safety and security, and waste collection. Data were collected with a survey administered between May 2009 and May 2010.
This presentation explores results obtained for selected PLUREL case study regions and other European cities, displayed using a specially developed tool called "QoLSim" or Quality of Life Simulator, based on a generic 'Market Simulator tool' which takes the ACA output that quantifies the likelihood of choice for different scenarios in which one or more attributes change and converts it into a predictive model where changes in behaviour are modelled as a result of land use changes which cause a corresponding change in the level of the various attributes.
The relative importance of the eight indicators studied are compared using the ACA, showing that, in general, respondents find 'safety and security' the most important factor. However, importance varies among sample segments, as will be shown. QoLSim is demonstrated, allowing preferences for different QoL scenarios by different segments to be examined.

PLUREL

Topics 6 and 7

Growth Management, Governance Systems, Locally Adapted Strategies

Hilda Blanco
University of Washington

Towards a Sustainable Urban Form Theory

Sustainable urban form is often identified with the compact city agenda. But while the compact city agenda addresses issues of land use, transport, and energy efficiency, as well as sociability and active living, it does not adequately address other aspects of sustainability, such as urban form impact on ecosystem services, or a city's industrial ecology. The objective of the paper is to begin to delineate an integrated sustainable urban form theory.

After an analysis of the concept of sustainability, I canvass major strands and sub-strands of theory, research, and literature related to urban form. The major strands of urban form theories examined include: several urban design theories, including urban morphology (Moudon 1995); compact city theories, including new urbanism, smart growth, healthy cities; suitability analysis (Collins, Steiner, Rushman 2001), including natural hazards mitigation planning; urban ecology or urban ecosystems (Pickett et al. 2008); and urban metabolism analysis (Kennedy et al. 2007). These theories or approaches are analyzed according to the type of theory, whether normative, prescriptive, descriptive, model-based, and their interrelations; the type of research supporting it and the general findings from the research; the level of resolution, whether fine or course-grained urban form; the scale(s) the theory focuses on; their value focus, and other factors. Each theory's contribution to urban sustainability is discussed. Contributions to sustainable urban form theory, for example, include appropriate resolution of urban form data; energy conserving urban patterns; factors that facilitate sociability and public health; model-based research on how urban patterns affect ecosystems, and methods to document material flows through cities. In conclusion, I indicate how these different strands can be conceptualized into a coherent and dynamic framework for understanding the physical structure of cities and their sustainability, as well as the methods/models required to develop such a theory.

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Land use changes in peri-urban areas and transformation of regional identities.

Land use changes in peri-urban areas imply transformation of regional identities. Identities are only partly constructed by people's observation of reality, as stories and images about present and future also affect the way people relate to their surroundings. Therefore already scenarios for future land use change use various visualisation techniques for communication with the public about present and future (REF). This way, pictures and maps of the actual situation and from the past help the regional design process for imminent changes of an area to find inspiration and to define the range of future developments (REF). Pictures and maps of past and present can help to define to which old elements and structures in the landscape should be preserved, but also visualisation helps to discuss to what extent modern functions are allowed to change places.

Not only can images be employed to help regional design processes, images also reframe current perceived realities. They can create an awareness over landscape qualities that would otherwise remain invisible. Peri-urban areas in particular are in need of cohesive identities to make up for their eclectic land use mosaic.

The goal of this paper is to discuss the potentials and dilemmas involved in using old landscape paintings as an instrument to generate a dialogue over landscape transitions in peri urban areas that helps finding or enhancing regional identity. A case study in the peri-urban region of the Hague is described that was designed to explore the possibility of using landscape paintings of the Hague school of painters as a way to expose major land use transitions, and as such assess its potentials as identity marker for regional place concepts.

The case study in the fringe of the Hague shows that using old paintings for landscape debate is a promising way to impact people's frames of their surroundings by offering a direct confrontation on the spot of the actual situation and the former landscape, with the emotional imagination of a painter as a possible catalyst for current emotions related to landscape attachment.

Exhibiting paintings in the peri-urban landscape, as unique representations of the features and landscape qualities of the past, may be a new way of using images in planning process via the role it may have in constructing regional identity; to 'label' or 'brand' the area in a specific direction as a strategy to help preserve specific values of an area. Our case study can be seen as an example of new ways to stimulate local involvement and commitment for regional development processes, using imagination and acknowledging the multilayer value of places, including stories, history and the emotionally charged perception of change.

Duane De Witt
MCP, MLA

Citizen driven community based nature conservation at the peri urban edge

Citizen driven, community based, nature conservation at the peri-urban edge of a sprawling city is the topic of this paper. With a northern California city as the case study a multi year effort by citizens living at the peri-urban edge to save some natural areas from urban sprawl is examined in depth. Numerous aspects of this citizen effort are analyzed and described in detail. The tension between top down bureaucratic land use planning in the city of Santa Rosa, California and grass roots level citizen action is highlighted in the exploration of this unique example.
Currently about 2 hectares of land have been saved from development while another 5 hectares are being proposed by the citizens for further preservation and conservation in perpetuity. Close to a decade has been spent by some of the citizens in this effort. Now it may come to a conclusion within the next year.
California land use planning has been characterized by leap frog development out from the city centers to the peri-urban edge for many decades. When citizens have tried to fight for conservation of natural resource areas it has been a contest between land development and speculation by developers in conjunction with jurisdictional agencies against citizens. The challenges, obstacles, and techniques employed to overcome them are explored while successes are highlighted in the report in order for models to be illuminated for future use by citizens elsewhere.

Laurence Delattre
INRA

Urban sprawl, environment and local land use policy determinants

Our work deals with the determinants of natural and agricultural space preservation policies at the local scale. We consider essential to understand motivations that lead local decision makers to adopt either compact city or sprawl oriented policies. The goal is to make recommendations for the design of more coherent policies at the regional scale, especially regarding environmental aspects. Land use change may indeed be the main factor affecting ecological resources (Hunsacker and Levine, 1995). However, despite many studies regarding sprawl, impacts and drivers are still hotly debated and empirical studies lack in the European context, especially at the main level of decision in numerous countries: the municipal one. We propose to analyze the determinants of local land use policy decisions in a region of Southern France (Provence) where sprawling is an important phenomenon menacing a very high biodiversity richness (Médail and Quezel, 1997).

As showed by Munroe *et al* (2005), land use policies such as zoning play an important role in the urban-rural fringe configuration. However, they are not always used to achieve a sustainable urban form and can even favor sprawl (Fischel, 1995; Pendall, 1999). To analyze the determinants of these decisions, median voter or rent equilibrium models are used and welfare promoting, fiscal competition, segregation and political fragmentation hypotheses are tested (see e.g. Rolleston, 1987; Richer, 1995; Brueckner, 1998; Carruthers, 2003; Nguyen, 2009). These studies allow to link socio-economical characteristics and even environmental one's (Schläpfer and Hanley, 2003) to land use policy and consequently to urban shape.

Our presentation will first stress on problems and lacks in the existing studies. Consequently, it will continue by a discussion on methods that can be mobilized to improve our knowledge on the sprawl phenomenon. Our work consists in selecting the relevant indicators to characterize and make typologies of municipalities regarding environmental sustainability of urban configurations (see e.g. Galster *et al*, 2001; Jenks *et al*, 2000; Camagni *et al*, 2002; Barnes *et al*, 2007; Frenkel and Ashkenazi, 2008). Then, we will attempt to link these various configurations to political decision and its determinants. That's why we propose a way to model the relationships between socio-economic characteristics and land use policy. This will be done thanks to an important database about location of people, firms and land uses on Provence Region, as well as zoning at the municipality level.

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Peri-urban areas in Europe: comparative analysis of governance patterns

This paper assesses the different land use strategies in peri-urban areas across Europe, and analyzes how certain governance patterns might explain the performance of the strategies. In particular, it examines how land use planning at regional level is combined with integrating agriculture, biodiversity protection, tourism and recreation in the development of the urban fringe. What role does government play in relation to private interests to steer the development of these areas? To what extent is it possible to detect patterns of governance that may control such developments? How can policies for the urban fringe be improved to foster sustainable outcomes?

The analysis departs from academic definitions of governance and discussions on the nature of diffusion of political power in multilevel policy arrangements (Pierre 2000; Pierre and Peters 2005; Rhodes 1996, Marks 1993, Kohler-Koch and Eising 1999, Hooghe and Marks 2003, Jänicke & Weidner 1997, Baker and Eckerberg 2008). The empirical analysis of peri-urban policies is further guided by Tatenhove's *et al* (2000) definition of environmental policy arrangements in terms of policy coalitions, policy discourses, rules of the game, and resources. Their framework of policy analysis has the advantage of considering both discursive and procedural analysis, hence recognizing the links between discourse, law and democracy.

The seven case studies were undertaken within the PLUREL project by national teams of researchers in collaboration with regional and local actors who examined the characteristics of policy arrangements for each strategy. They include Warsaw in Poland, Leipzig in Germany, Koper in Slovenia, Manchester in the UK, Montpellier in France, the Hague Region in the Netherlands, and one - Hangzhou - in China.

The case studies present a bipolar development of congested cores versus rural decline in the studied urban regions. In the former East European context, rapidly changing economic conditions has put previously protected lands for agricultural and nature conservation under high pressure for commercial exploitation, while public control is falling behind. While the west European countries have mature spatial strategies and planning, they still suffer from inadequate integration between parallel initiatives. In the Chinese top-down planning culture, peri-urban policies are not defined but exist only as default between the urban and the rural.

Globalised markets for agriculture and urbanization of rural populations have created new conditions for land use policy in the urban fringe. Steadily rising land prices and expansion of industry and housing at the expense of open spaces, green belts and nature reserves are commonplace in the studied areas. Public discourses on environmental protection are gaining ground at the same time as economic development and expansion of city infrastructure and urban values is embraced by political elites and private developers. We observe that most regional policies are weak in social and environmental performance because the most powerful actors have a biased discourse/vision, aimed at economic development. Indeed, the case studies show that the role of government is changing: previous strict policies and state intervention are loosening up and leaving room for increased discretionary judgments when faced with multiple development interests. Weaknesses in performance of well-intended strategies are explained by missing legal force or control of the land resource, in combination with lack of financial means, inadequate culture of spatial planning or cooperation at regional level.

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Assessment on the inner city rural areas development dynamics: the Case of İzmir-Doğançay Neighbourhood

Since planning practices in Turkey are mainly devoted to city planning rather than regional or rural planning, the priority is given to the city and economy which complements its relationship networks. Therefore, inner-city rural areas are seen as a problem for city administrators and/or city inhabitants. The underlying reasons are:

- the lack of city administrators' experiences aimed at urbanization of the inner-city rural areas within their own conditions,
- the lack of city inhabitants' aesthetic and formal concerns to define the city in which they live and lack of their adaptability to meet and live together with different lifestyles.

These two problem areas should try to be solved under the leadership of city administrators and by way of providing public participation in case of need.
However, beyond anything, the problems for the inhabitants of that place cannot be taken into consideration due to lack of related experience and awareness because the purpose appears to be urbanizing the area in accordance with the pre-experienced city planning approaches.
In theory, planning constructs itself according to distinctive conditions of the place. However, when old inner city rural areas are to be at issue, the practice apeears to be confined to the already-experienced 'urban' setting, which in fact contradicts with the essence of planning as an interdisciplinary field with broader concerns and responsibilities.
This paper is based on the project carried out by the second year students of Dokuz Eylul University Faculty of Architecture Department of City and Regional Planning Undergraduate Program, on basis of the main approaches adopted in project framework, the obtained projects and evaluation of the results
The projects produced in studios were constructed under four main topics, and approximately six subtopics were determined under each main topic and total 25 projects were produced. The mentioned main topics are in the forms of planning the settlement on the basis of

- current trends
- cultural and touristic functions
- development into secondary housing zone and
- planning approach based on sustainable development and conservation of ecology

The paper will present the suggestions of the produced projects specifically and will discuss these proposals in terms of their applicability in planning practices of Turkey.

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Urban-rural interaction in sustainable land management

In rural and urban areas different spatial demands of actor groups cause heterogeneous types of land use. For a sustainable spatial development specific programmes for rural and for urban areas are already adopted like the European Policy for Rural Development and the Leipzig Charta on Sustainable European Cities. With the instrument LEADER and the approach of integrated urban development both of these programmes imply specific interaction strategies. However in peri-urban areas, where different spatial demands clash, models of governance for an integrated and effective land use reflecting interactions as well as a balanced spatial development are still missing.

Within the frame of the new German research programme 'Sustainable Land Management', funded by the Federal Ministry of Education and Research (BMBF), innovative theoretical, methodological and conceptual approaches of spatial governance will be developed, used and valuated. The authors are responsible for the scientific coordination of one of the two modules focussing on the development of successful tools for sustainable land management in Europe. The scientific coordination comprises more than ten joint research projects working on different issues of sustainable land management by means of case studies situated in Germany.

The full paper and presentation elaborate different approaches of analysing rural-urban interaction applied by the variety of the attended joint research projects. Adapted strategies, instruments and concepts to push rural-urban interfaces within the context of a sustainable land management will be analysed and models of governance in peri-urban discussed. Questions to answer are: Who are the main actors focused by the projects? Which scale is assessed as appropriate? Which models of interactions are analysed? What governance models are reflected? In consequence new lines for discussing special needs for sustainable rural-urban land use relationships will be presented.

Nick Green
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The English Problem - Planning for peri-urban nation

Only fragments of the English landscape display no signs of human intervention; genuine wilderness is almost non-existent, and England's settlement patterns are part of what Mike Batty has called a 'deeper continuity' that extends two millennia into the past [1]. These settlement patterns are quite dispersed, so that although just nine per cent of England is actually developed land, there are few places where one is not near a settlement of one sort another [2].

This puts England in an odd position, and it is this: the whole of England can reasonably be thought of as a contiguous peri-urban region, punctuated by numerous towns and cities where people live and work, and between which people travel. To be sure, some have argued that there is an 'urban-rural' divide, and this turns out to be more or less coterminous with the much better known 'north-south' divide between London and the south east, and the rest of the country [3-5]. The divide is mostly an economic one: the south east and pockets of the rest of the country are more wealthy than average, while the rest of the country is less wealthy than average. Sometimes the differences are extreme — ex-industrial areas have suffered badly, for example — and this where policy comes in.

At present, the overarching planning policies that do exist are 'national' only insofar as they are intended to be applied by all planning authorities in the nation. There are regional policies, in the form of 'regional spatial strategies', but there is no formal mechanism by which adjacent regions' strategies can be made to relate to one another.

The question that we shall address in this paper, then, is how policy can handle what is in effect a very large, highly polycentric rural-urban region [6]. The paper will conclude by arguing that peri-urban regions, being both urban and rural at the same time (or maybe something in between), need policies that can address both urban and rural problems at the same time. In the case of England, it follows that there is a strong analytical case to be made for a national spatial strategy for England.

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Institutional dimension of governance in metropolitan areas: spatial consequences of fragmentation of powers and responsibilities

In the paper an issue of institutional dimension of metropolitan governance is addressed from the perspective of its impact on model of governance and consequences for spatial development. PLUREL contributions to studies on functional urban areas development will be discussed and confronted with other approaches and methodologies used in the studies conducted in Europe under ESPON and other programs.

The case of Warsaw Metropolitan Area will be used to exemplify how changing institutional environment influences processes of policy making and processes of formulation of specific strategies and development programs. Spatial results of these processes will be presented in the context of peri-urban areas development and formation of functional structure of the area.

The institutional framework of governing development of functional urban areas is a key factor in the process of designing and implementation of sustainable development policy. However, the architecture and characteristic features of the institutional framework differ from country to country and evolve over time. In the paper the paths of this evolution, their determinants, and consequences will also be presented and related to the case study of the Warsaw Metropolitan Area. It will be done in order to evaluate how adequate current institutional arrangements are *vis a vis* development problems and challenges.

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Applying regional planning schemes in East Jutland, Denmark. Examples from Copenhagen, Montpellier and Portland

In the eastern part of Jutland, Denmark, a polycentric urban region is emerging. Besides Århus, the second biggest city of Denmark, several medium-sized cities are located in the area. The region is expected to experience further urbanisation which might result in urban sprawl and threaten valuable landscapes. A common regional planning scheme is discussed for a while, but nothing is agreed on yet. Our objective is to apply three interesting spatial schemes to our case study region.

The three planning schemes are well known for their simple and clear approach: The Fingerplan of Copenhagen urban region, the SCoT (Territorial Coherence Scheme) of Montpellier Agglomeration and the Urban Growth Boundary of Portland. By the way of an ex post thought experiment we apply the three approaches to the situation in the year 2000 and discuss hypothetical effects of them regarding actual land use changes between 2000 and 2006, documented by CORINE.

The Fingerplan was elaborated in 1947 but became first in 2007 a legal planning document. However, its simple principles of development along the commuter rail lines and the protection of green wedges in between them guided spatial development in Copenhagen since then. For East Jutland we copied the “development close-to-station” principle and instead of green wedges, we identified important green areas. The application shows that only around one third of all urban development happen within the area dedicated for urban growth. The Fingerplan would foster a development aligned along mass-transport corridors.

In the Montpellier case, the planning scheme has the particularity of having a “sight inversion”. Thus, the landscape is presented as an integrated part of the reflection on regional development. In other words, it protects natural and agricultural areas of any changes; in parallel the overall spatial strategy also privileges urban containment by limiting new urban development within existing urban area, at its direct proximity or along main urban transport corridors. In East Jutland, the concept of “valuable landscapes” is used in our study to apply the “sight inversion” approach made in Montpellier. As a result, 24% of the land cover changes of agricultural and natural areas into artificial areas in East Jutland between 2000 and 2006 happened in “valuable landscapes” areas.

In 1979 the newly created Metropolitan council of Portland (Metro) established a first urban growth boundary (UGB) around Portland, following the adoption of the Senate Bill 100 in 1973 and new state wide planning goals. Metro is required to maintain a 20-year inventory of developable land within the UGB, to be revised every 7 years. With population projections from 2000 for Eastern Jutland we calculated a future land use demand for 2020.The necessary area was allocated as close as possible to existing urban area, but outside important green areas. Only 20 % of the growth between 2000 and 2006 happened inside this fictive UGB. The UGB would foster compact city development in the region.

The three approaches shown here can however not illustrate an ideal planning scheme for the region. A focus on mass-transit corridors like the Fingerplan excludes many areas in East Jutland, as the rail-network is not that dense as in Copenhagen. The SCoT approach is limited by the fact that no official delimitation of “valuable landscape” has been done; and the urban growth boundaries seem rather fragmented for a regional scheme which should also communicated a common vision.

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Creative Intervention in Dynamic Urban Regions: a Sustainability Assessment Approach of Interim Use Strategies for Shrinking Cities

Urban shrinkage affects many cities across the world, especially former industrial areas. One of the most dramatic areas of population decline has been in eastern Germany since the fall of the Berlin Wall. In 1999, the City of Leipzig started a program to revitalize its declining neighborhoods. Taking over the development of private brownfields and waiving property taxes in return for a promise of regular maintenance in a program called interim use, the city has vastly increased public greenspace in these neighborhoods. Despite regional acclaim and imitation, the strategy has thus far lacked a comprehensive evaluation: How successful has the interim use strategy been? This study approaches that question in the context of the city's sustainability goals and public use and perception of the sites, thereby providing insights for planners into the efficacy of this planning tool for neighborhood revitalization. Our sustainability assessment of the interim use sites uses an original evaluation method combining indicator-integrated surveys and questionnaires with expert interviews. The results show that interim use sites scored higher overall than their closest counterparts, recently demolished brownfields. They also have a much greater usage rate. However, most people using the sites do not recognize the sites as being a result of city intervention, and many complain about the lack of site maintenance and benches. We conclude that public acceptance and support for interim use can be strengthened with more seating, punitive measures for property owners and increased communication about the strategy and its potential as a planning tool.

Sigbert Huber
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Proposal for concept of urban soil management

Urban areas tend to further expand into rural areas as prognoses forecast an increase of the percentage of people living in cities which need further settlement areas. Urban sprawl causes land consumption, usually by converting agricultural land into building land. As there will be a need for further building land for different purposes the land consumption has to be steered towards a sustainable use of land. Currently in practice of land use planning in Central Europe the environmental quality of the land, in particular the limited resource soil, is rarely considered. But several natural functions that soil can provide are crucial for certain land use types and therefore for quality of life in urban and adjacent areas. In the project URBAN SMS (Urban Soil Management Strategy) of the Programme CENTRAL EUROPE of the European Regional Development Fund a concept for urban soil management to support improved consideration of soil in land use planning is developed.
The basis for the concept was the collection of legislative, strategic and subsidy instruments influencing the use and protection of soil in the six partner countries. Based on a SWOT analysis best practice examples have been selected and gaps were analyzed. Additional scientific and technical needs for sustainable soil management were identified. Stakeholder experience was used to identify practical needs and limitations. As the soil management concept should be introduced in land use planning the spatial planning systems and procedures of the partner countries were described. Related to that selected soil management approaches and their implementation within existing urban planning procedures were collected and characterized. The results of the synthesis report contribute to identifying existing gaps in implementation of soil management in urban planning processes and to provide vital building blocks of a future framework for soil management. Furthermore a guideline for improved consideration of soil in strategic environment assessment and environmental impact assessment was drafted. These assessments are seen as specific planning instruments where guidance for evaluation of the resource soil is still needed.
Policy instruments, planning procedures as well as management approaches having influence on soil are different between and often also within the CENTRAL EUROPE countries. But based on the experiences gained successful approaches can be transferred, adapted and further developed within a common concept of urban soil management. Such a concept can help to find locally adapted strategies for soil management in rural-urban areas.

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Changes in governance, improvement in spatial planning: how a new local government implements a powerful planning tool to manage urban-rural sustainable relationships. Montpellier Agglomeration Plurel case study.

The attractiveness of the Mediterranean coastal region impresses strongly Montpellier urban area where population keeps on growing because of highly positive migration balance. Urban sprawl caused deep changes in periurban landscapes during last decades. New buildings took place where vineyard used to be the quasi-unique land-use. Local economy now largely depends on tertiary activities.
In a situation of uncoordinated territorial governance, these driving forces led to large population mix, chaotic development, space waste and degradation of periurban landscapes. Montpellier Agglomeration, a new local authority, was created at the end of 2001 as a response to national legal and financial incentives, and to local challenges. This local government, gathering 31 municipalities, is in charge of several major public policies. Montpellier Agglomeration brought about deep changes in local governance and planning practices. This paper analyses the governance issues and presents how this new authority addresses the challenges of sustainable management of urban-rural development at regional and local scales: development strategies elaborated and spatial planning tools implemented.
Lessons can be learned from the experience of Montpellier Agglomeration in the field of periurban land use relationships, the paper presents the following items:

- The local context is broadly presented through historical changes in land uses and demographic components in Montpellier city-region. Local governance issues are also analysed, as are the different steps of the construction of Montpellier Agglomeration.
- The Scot (territorial coherence scheme) of Montpellier Agglomeration is analysed and assessed as an innovative experience of regional planning. The Scot of Montpellier Agglomeration stands out because of the attention paid to the protection of open spaces (either natural zones and farmland), and the use of landscape as major vector of urban planning. It also enacts strong development rules to intensify housing and contain urban sprawl.
- The results of a prospective study conducted with Plurel project are presented: four scenarios have been elaborated, combining differentiated local data and political decision making, and/or external driving forces; these scenarios have been put to the test by spatial modelling and submitted to local stakeholders, in order to help thinking Montpellier Agglomération's future and feed back decision making in periurban land use management.

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Making sense of nonsense: urban sprawl and social representations in the Quebec metropolitan area

This contribution illustrates the use of social representations towards strategic management of Urban Sprawl in the Quebec Metropolitan Area (QMA). Urban Sprawl, a space-consuming mode of planning associated with the extensive use of personal vehicles, remains one of the greatest challenges in the development of metropolitan regions. The QMA, covered by forests and agricultural zones at a rate of 77%, faces demographic rates increasing beyond the urban fringes. In this context, urban planners, local councillors, citizens, scientists and environmental groups get increasingly interested in defining a sustainable regional vision. However, we observe a gap between stakeholders fighting against sprawl and those fighting against urban densification. Indeed, these stakeholders hold various meanings, either positive or negative, of the causes and consequences of sprawl. Actually, they seem to fail structuring the problem situation of Urban Sprawl.

Defining a problem situation constitutes a preliminary step of a decision support activity and can be structured through the representation by a subject to explore and propose interventions. The social representations constitute an interface between these subjects and the reality. In this context, Urban Sprawl constitutes a shared reality on which constructive dialog barely evolves towards consensus. Thus, what are the mechanisms that lead to sprawl? Where are the anchor points between the stakeholders? Could the initiating of interaction between the stakeholders lead to consensus on a vision?

A participatory approach is proposed, involving the same participants in five steps. Firstly, we build a social network of Urban Sprawl covered in local media from 2006 January to 2009 March. We then organize stakeholders in groups according to their covered interaction level. Secondly, we create from an online survey a set of 30 key concepts relevant to represent Urban Sprawl in the QMA. Thirdly, four groups of about 10 participants negotiate the classification of the key concepts in issues they find relevant. Fourthly, the same groups build separately a shared cognitive map of Urban Sprawl. Finally, the groups propose key interventions that could be integrated as action levers of their represented situation.

Urban Sprawl is depicted as being “nonsense” between two couples of contradictory forces, individual vs. collective issues, and aimed vs. perverse effects. Their cognitive maps illustrate fragmented, yet deeply complementary representations. Those core representations appear as cornerstones towards constructive communication on complex urban-rural issues.

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Planning Quality of Life in Urban-Rural Regions – Seven Approaches in the Baltic Sea Region

Quality of life is a concept that is broadly used both by the general public as well as among policy makers and spatial planners. In recent years, it has become an important dimension in various policy fields, including spatial and environmental planning, health promotion and social policy. Policy agendas on sustainability, equality and social cohesion at different levels have also sought to ensure that discussion of quality of life issues become much more visible. In addition, one can observe a rising awareness of various other factors that influence individual well-being in modern societies. The focus of our paper is, however, the relations between people and their everyday living environments, which bring their individual perceptions and appraisals to the centre of the debate.

So far, the focus and methods used to 'plan' quality of life in the frameworks of urbanrural interactions has been rather limited. The conditions for urban-rural interactions are dependent on developments and processes at the macro level, but at the same time the behavioural decisions at the micro level (individual) have effects at the macro-level, i.e. through changes in the urban-rural structure. Our basic working hypothesis is that progressive approaches to quality of life cannot be based solely on policies initiated by hierarchical co-ordination or public institutions. It should also consider individual aspects and preferences. This requires in turn a thorough analysis to reflect individuals' preferences and spatial representations on quality of life in order to identify tailor-made interventions and methods for policy-making and spatial planning.

At first the paper will shed light on some theoretical reflections on the relation between the concept of quality of life as an individualised and subjective phenomena and its potential added value for regional planning. After that we intend to draw upon some preliminary empirical evidence from the INTERREG IV B project NEW BRIDGES on how these issues raised above are being tackled concretely in seven city-regions with very diverse urban-rural settings in the Baltic Sea Region. In doing so, we will take into account the following key elements of quality of life: (1) residential preferences (2) mobility & accessibility and (3) provision of services. Using different analysing methods the paper will reflect some similarities and differences of the planners' rationales and expectations, their current practices and activities in view of involving stakeholders in their city-regions and how to incorporate and finally reconcile individual preferences regarding quality of life in line with their 'own' agenda for dealing with urban-rural interactions and to make the entire city-region more attractive to different kinds of actors.

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Peri-urban Dilemmas: A Time for Change

Australian metropolitan regions have experienced unprecedented rapid growth during the last three decades. Attempts to manage the outward expansion of our cities and the fringe or peri-urban areas *('peri'*: around, about or beyond), through conventional urban planning and growth management strategies have failed. The "urban tidal wave" continues its outwards thrust, exacerbating landscape fragmentation. Peri-urban areas continue to exhibit the hallmark characteristics of a blurred transitional zone of urban and rural activities randomly existing without apparent order and exhibiting a high degree of heterogeneity, continual change and conflicting values.

This paper will discuss the findings of a scenario planning exercise undertaken as the concluding phase of a two year national research project into peri-urbanisation associated with Australia's two fastest growing metropolitan regions - South East Queensland (SEQ) and the greater Melbourne region. Two opposing scenarios were developed to address a theoretical debate in the contemporary literature about the ability of peri-urban areas to withstand certain drivers of change associated with the forces of urbanisation. These two scenarios, *Agriculturally Declining* and *Agricultural Revival* scenarios, served as a "test bed" to assess the likely performance of the region's current statutory land use planning and natural resource management (NRM) instruments.

In both case studies, there were early signs of the *Agriculturally Declining* scenario, alongside signs of the alternate *Agricultural Revival* scenario. This suggests that both regions are at the cross-roads of significant change. The study foresaw the continuation of land use intensification with increasing investment in intensive high capital forms of agricultural production and non urban industries including the equine industry. This would have the effect of continuing spatial landscape fragmentation where the existing statutory planning tools will be ineffective in managing the ongoing peri-urbanisation process.

The study made a case to resolve peri-urban landscape fragmentation, and its ensuing negative legacies, by firstly addressing the overarching institutional fragmentation. Vertical and horizontal alignment of State and Local government planning systems is an initial and essential change. This should subsequently lead to the integration of individual agency plans which operate across the same peri-urban landscape. Only after reform of these planning and institutional settings is achieved can the real purpose of planning be fulfilled. However, it was also concluded that a new planning approach was required to manage an emergent new peri-urban settlement landscape identified in the study – one that is neither truly "urban" not truly "rural".

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The 'making' of place-based community in the urban-rural fringe; the significance of shared visions of quality of life and sustainability

This paper explores the importance of quality of life perceptions of community in urban-rural fringe locations in Ireland. As a specific space at the interface between the urban and the rural the fringe incorporates processes of rapid physical, social, and demographic change. Among the main preoccupations and concerns in these rapidly evolving fringe locations are those relating to what can broadly be described as 'quality of life'. How this concept is understood across different groups situated within the spatial setting of the fringe, and how it influences the development of a sustainable community there, are central to this discussion. Drawing on household interviews from four case-study locations surrounding Galway City, Ireland, this paper examines how quality of life is experienced across a range of social and spatial dimensions that relate to these locations, and the extent to which they provide a common set of interests around which community may be built. From a wider knowledge perspective, it contributes to debates about how the concept of community provides explanatory power regarding the way in which individuals are associated with one another on the basis of a set of shared interests or concerns within a particular spatial setting.

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Peri-urban Development in the Age of Limits: An Examination Landuse Planning in New South Wale, Australia.

It has long been recognized that there are limits on the capacity of land to provide for the needs of humanity and other species. In agriculture, for example, there are standard measures of the stock carrying capacity of land. Similarly, land has a finite capacity to accommodate humans and human activities. The way in which land is treated may compromise its capacity to provide in several respects, especially with regards to the quantity and quality of natural resources. While natural resources such as water, food and shelter are renewable products of the land, land itself is non-renewable. Poor treatment of land or poor allocation of land uses will have deleterious consequences for natural resource production and land availability in future. As the total supply of land is relatively fixed the devotion of land for one type of use will reduce that available for another. The dominant mechanism by which scarcity of land use is signalled in Western capitalist systems like Australia is through land prices. However, these may not recognise externalities such as value for agriculture production and thus artificially inflate the value of land for residential use. Conversion of prime arable land for urbanization in Australia has exposed the threats to food and environmental security posed by increasing population growth and the failure of our social institutions to recognize the true value of land. The way land is treated and evaluated affects the sustainability of life. If we are going to live within our means then we need to review and revise the way we evaluate and use our land and resources. Using examples from Australia, this paper examines how land has been evaluated and treated legally, scientifically and economically and charts a possible way forward for a more sustainable future.

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Universidad de Granada

Instruments for planning and managing an agro-urban park in a Mediterranean delta

An agricultural park is considered a good solution for developing and promoting periurban agricultural spaces pressed by urbanization through enhancement of agricultural uses. Nevertheless, some areas even with an important agricultural activity cannot be classified just like agricultural areas or landscapes due to a presence of urban elements and uses. These areas are usually called -periurban landscapes- or zones with -periurban agriculture-. But in this research the study zone is characterized for its small area, without a high infrastructural and industrial developing, with important cultural values and out of the scales in which the periurban processes have been commonly studied.
Within this context, instruments related with planning and managing the agro-urban issue have to be developed and applied.
The proposed planning instruments are focused in zoning on the basis of different susceptibility levels for each land use and with associated managing instruments.

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ISSER, University of Ghana

Conflicts and Governance of Landfills in a Developing Country City, Accra

The effects of landfills and other solid waste facilities on nearby residential communities have been the subject of much debate in the developed world, where the state-of-the-art, environmentally and well-engineered landfills are common. Yet, academic research and other evidence are inconclusive on the adverse or otherwise effects of landfills on property values in developed countries. Like many countries in Sub-Saharan Africa, Ghana lacks well engineered sanitary landfill sites. More importantly, increased urbanization and urban growth, and concomitant growth of real estates in peri-urban areas of large Ghanaian cities such as Accra, have meant that landfills must compete with residential land use resulting in closer proximity of landfill sites to residential neighbourhoods. Thus, increasingly due to the intense competition for land the capacity of the peri-urban areas of large cities to absorb urban-generated waste is compromised. However, unlike cities in the developed world, there has been very limited research of the effects of landfills on nearby residential neighbourhoods. What is often pronounced through civil society and NGO actions are the potential environmental and health consequences of these landfill sites. This paper attempts to fill the knowledge gap by exploring the effects of landfill on residential property values in Ghana, using the landfills in peri-urban communities Oblogo and Mallam landfills in Accra as a case study.

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What is the peri-urban control in France today? Case of the individual detached house into the first ring of Rouen's urban area

Since the publication of the "Solidarité et Renouvellement Urbain" law on 2000, supplemented by the "Urbanisme et Habitat" law, the discourse on the operational urban planning has tinged with an environmental dimension while advocating a better control of the urban sprawl, and consequently a better control of natural and agricultural areas consumption into urban rings. Indeed, the environmental problematic has become one of the major aims that towns must face up to, especially in terms of spatial management. Therefore, the French locals authorities has been invited by the State government to work out both the "Plans Locaux d'Urbanisme" and the "Schéma de Cohérence Territoriale" within which must be planned out the terms of reasoned urban growth on behalf of sustainable development. These policies are part of a re-use of built spaces, in particular within the downtown areas, by a derelict-land reconversion and so an urban space renewal. Also, they base on more strict management about new parcel of land opening for urbanization, mostly in peri-urban spaces.
In our approach, we will focalize on the case of the individual detached house who represents the visual symbol of urban sprawl and who is the biggest spatial habitat consumer. Our geographical area is made of municipalities included in the Rouen's S.C.O.T. and bordering municipalities. This study will starts off from two typological analyses, first about news individual detached houses building from 2000 to 2009 per municipalities, and second about fifteen local urban planning programs' municipalities. These both analyses will enable to build a typology isolating five types of municipalities from several geographical, sociological, political and environmental parameters. Finally, we will conclude with surveys from related town councils from which we will extract inner logics about its governance and decisional systems.

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Integrating governance & research in the peri-urban: responding to the joined-up climate change policy agenda around Europe.

The peri-urban is a multi-level, multi-sectoral, multi-functional, complex and open system, where local effects may be driven in multiple ways by regional, national or global forces. This presents a challenge for conventional urban or regional governance systems, which are based on clear territorial units and policy divisions. In parallel there is a challenge for the research community, in how to provide evidence for such governance systems.

The Integrated Project PLUREL has brought together a range of research approaches, and reviewed a range of governance approaches. One question focuses on 'integrated' governance systems which can respond to the 'integrated' problems of peri-urban development. Another question looks at how research can be better 'integrated', to support and respond to such governance systems? These suggest an evolutionary-systems approach, which helps to link between different policy fields and knowledge domains. This paper looks at a topical example: climate change adaptation and mitigation in the peri-urban area. This highlights some alternative models of governance and future directions for peri-urban / territorial cohesion policy.

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Applying urban regeneration approach in peri-urban districts planning; a case study of Farahzad district, Tehran

Recent decades, many cities, especially in developing countries, have encountered over urbanization. For instance, what is known as Tehran today –as the capital city of Iran- is a hyper-urbanized metropolitan which has had a cancer-like growth and till now has swallowed over 65 villages. Consequently, many low quality informal settlements observable all around the city even in so-called prosperous regions. Despite these marginalized settlements have been formed in ex-rural lands, they are located inside the definite boundary of today Tehran and being home for many migrants, they encompass diverse cultures. These different origins and incohesive communities cause profound conflicts. Facing such bottlenecks leads to an unsustainable condition. One of these settlements in northern Tehran, which is a 128-hectare district, originated from Farahzad village. Considering its deteriorating condition accelerated by rurban culture, this district seems to encounter *Urban Decay* phenomenon which is an issue connected with quality reduction of social, economic and physical state. Nevertheless, planning policies and scenarios suggested to mitigate the challenges of such problematic areas have mostly had sectoral attitude which their failure in ascertainment is the best evidence for their shortcomings on the way to treat these multi-character districts which have multi-sided nature.

Regeneration approach is an approach which has been constituted gradually in post war era in response to urban decay and has been vastly used since 90s. This approach wants not only to overcome physical and economic deficiencies but also pays much attention to social, cultural and environmental regeneration within a multi-dimensional perspective. This research seeks to show that towards planning for enhancing the deteriorated condition of settlements similar to Farahzad, how regeneration approach would be useful with regard to its capacity to adapt local attributes with aid of stakeholders. Article, thus, investigated different aspects of urban decay in peri-urban district of Farahzad. Afterwards, urban regeneration approach has been employed as theoretical framework and its traits have been scrutinized. As next stage, different aspects of target district have been described using documentary research and field study method in order to measure urban decay. Meanwhile, reasons of applying mentioned approach in this peri-urban district has been discussed. Based on analysis, goals have been determined and AIDA method has been utilized for deriving the optimum planning policies from outcome scenarios, regarding its concern to interconnected relations.

Simon Swaffield
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Reinventing spatial planning in the urban rural interface

Management of competing dynamics at the urban –rural interface is a challenge faced by all developed and developing countries. Most adopt various types of land use regulation, increasingly combined with other types of public intervention. In 1991 New Zealand radically reformed its planning laws and institutions as part of a wider liberalization agenda intended to open the country to the emerging global market economy. The focus shifted to the management of the environmental effects of land use, rather than upon zoning of uses themselves. From its inception however critics highlighted the potential risks to the sustainability of urban systems and peri urban landscapes from the new approach. The consequences of abandoning strategic land use planning have become evident around NZ cities during the prolonged economic boom of the past decade.

The strategic planning lacuna is now being incrementally filled by ad hoc strategies implemented under a separate law that was not designed for the purpose. The Local Government Act enables communities to undertake a wide range of sustainable development activities, and it has become the vehicle for the reinvention of land planning at several different scales. These include local area structure plans, city wide asset management strategies, and strategic planning initiatives for the city region. However none of these plans have legal power to direct private development, and their goals, strategies and priorities must be translated into the 'effects based' legislation in order to be implemented.

This paper traces the pathways of land use and landscape change within a NZ city region during this experiment in institutional and process reform. It illustrates the opportunities, risks and challenges of adopting a performance based resource management paradigm for the peri urban area. Potential lessons for other developed countries seeking to reform their peri urban planning systems under the pressures of globalization and neo liberal political agendas are drawn out and discussed.

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Spatial planning metaphors and institutional change

Simple and evocative spatial planning metaphors have been a vital tool in gaining political and public support for strategic planning of the urban – rural interface throughout the 20th century. Examples abound, such as Garden City, Green Belt and Urban Fence, Green Heart, and Finger Plan. Spatial planning metaphors appear to have been successful when they have been congruent with the dominant planning paradigms and political institutions of the era, and they have persisted when they have proven effective in managing the prevailing dynamics of change. But what happens when a working metaphor loses its institutional frame or becomes 'out of step' with the dynamics of change? What determines the resilience of a spatial planning metaphor and what can we learn from this for the development of new strategies for the urban rural interface?

In this paper we compare the modern histories of the application of two contrasting spatial planning metaphors. We use case studies located on opposite sides of the world, but each in countries where agriculture has formerly been both economically significant and politically powerful, but where new global dynamics have reshaped traditional urban-rural relationships. On the one hand, the Copenhagen region is notable for the resilience of the 'Finger Plan' strategy, which, despite major shifts in economic relationships and in regional functions, retains relevance and continues its role, albeit in a modified form. On the other hand, the Canterbury region in NZ has faced major planning challenges as its longstanding 'Greenbelt' strategy was rejected following institutional reform. Following a decade of poorly guided expansion, a new more sophisticated strategy has been adopted, but lacks the clarity of the former approach, and its effectiveness is yet to be proven.

This paper traces the pathways of land use change around these two cities and critically examines the interrelationships of regional institutions and political economies with the characteristics and effectiveness of the dominant spatial planning metaphors. We offer observations upon the selection and application of new metaphors for peri-urban areas in the 21st century, and identify research questions.

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The interest and the tools of the public sector to fight urban sprawl

When analysing the process of urban sprawl it is useful to make a distinction between two types of actors: moving actors in the Rural-Urban Region (RUR[1]): households (low-middle-high income), industry/businesses, retail/leisure centres; and non-moving actors in the RUR: key actors in the development process (landowners, developers); local and supra-local governments of the RUR region (doing planning, regulating, financial influencing, investments/taxing).
Based on this differentiation (which is taken from the URBS-PANDENS project) this paper concentrates on the local and supra-local governments of the RUR region. Although most of the land might be in private ownership, as Larsson (2006:19) put it: ownership rights do not mean development rights, which need approval in former plans. "Most Western countries nowadays consider it a power of the local authority to decide if, where, when and how a development may take place."
Thus the local and supra-local governments are in key position to influence land development in the RUR region. This paper has the aim to analyse a) which factors are determining their interests and b) what tools they have to fight urban sprawl, through influencing the decisions of the moving actors.
The public (government) actors can determine the conditions for new developments and through this to influence the suburban and peri-urban processes. There are differences between countries, how the decision-making power is allocated across the different levels of governments in the RUR area. For the subsequent analysis the emphasis is laid on those government levels, which are smaller – regarding their territory – than the RUR area. The sub-areas of the RUR, belonging to different governments with different regulations, might easily find themselves in competition with each other to attract the moving actors.
Among the factors influencing the interests/motivations of the government actors in regard to the processes in the RUR area, the following will be discussed in details: the local government financing system (from where and according to which parameters the local governments receive their revenues); the taxation system (the existence of different types of taxes the local governments are allowed to levy and the spatially relevant consequences of these taxes); and sectoral (infrastructure, economic development, transport, housing) planning, policies, regulations and subsidy systems.
Among the tools the public sector has to steer the land development process (through influencing the parameters of new developments which determine the interest of the moving actors), the following preserve most attention:
regulations applied on new land developments in general, such as sectoral requirements attached to permitting larger new land developments (balance between jobs and homes, transport services, physical and social infrastructure requirements) and financial regulations, such as taxes on green field investments, subsidies for brown field redevelopment; rules applied in the case of concrete decisions on larger land developments: possibilities for the public sector to recapture some part of land value increase when re-zoning a piece of land is allowed or at the moment when building permission has to be issued for the planned project.
Through the overview of the factors influencing the interests/motivations of the government actors and the analysis of the tools the public sector has to steer the development process it is possible to highlight the problematic aspects of peri-urban development. Such an overview also leads to ideas, in which regards the legal and financial regulations have to be changed in order to modify the development process towards more sustainable directions.

[1] The Rural-Urban Region refers to the 'extended functional urban area', i.e. to the urban core, the suburban territory and the rural area around it, which is in economic connection to the urban core..

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University of Groningen

The importance of visions for amplifying likely paths of peri-urban development

Peri-urban areas are dynamic heterogeneous mosaics of natural, agricultural and urban functions that are unique for every location and they change continuously. They are a melting pot of diverging perceptions, opinions and interests that evolve under autonomous contextual influences and self-organising local actions. Therefore changes can be unpredictable and future directions of peri-urban development are highly uncertain. The unpredictability and diversity, together with institutional fragmentation pose a daunting challenge to planners. We argue that dealing with peri-urban uncertainty may require planners to develop a more adaptive way of planning in which spatial visioning can be an essential element. Counter intuitively, unstructured problems are the ones that are most in need of visions. In this paper the potential of spatial visioning is assessed to support adaptive steering in peri-urban planning. By encouraging imagination, spatial visions go beyond conventional communicative planning, by offering comprehensive concrete and credible images of the future. Visions may unite stakeholders, offer multifunctional, innovative ideas of the future and provide a reasons for experiments helpful for exploring the 'possibility space' of peri-urban sites. By introducing a long term overall perspective, beyond sectoral interests, vision making might be valuable to produce and embrace innovative ideas emerging out of the interplay between local diversity and contextual trends. Provided a vision is sufficiently credible, relevant and legitimate, they may provide concepts that unify across diversity. At the same time good spatial visions remain flexible, they adapt and transform in interaction with different arenas and time-related conditions without losing their core ambitions and motivational capacity. Moreover, in peri-urban areas where the institutional landscape is often fragmented, the bridging capacity of vision making can be especially supportive for planning when giving more attention to local, formal and informal strategies and knowledge production. The effectiveness of a vision lies not in whether it actually achieves this future image it conveys, but whether it helps constructive dialogue across stakeholders. It is not an alternative way to achieve end-state central planning, nor a dismissal of the need for formal structures. Visions are constructive, dialogical, responsive efforts to formulate and propagate grand stories for a region, that may eventually persuade conventional bodies of decision-making to align. ...

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Cerro De San Pedro: grass roots movements in co-operation and conflict to stop a living city from disappearing

Grass roots movements in relationships of co – operation and conflict between firms, communities and government have a important role to stop a living city from disappearing. This paper describes and analyzes the implications of the collective action used by grass roots movements in the defense of an old mining town, Cerro de San Pedro of being disappeared due to the pollution of fresh watersheds by the operations of a mining company and the effects on the living city of San Luis Potosì, in the center of Mexico.

The mining operations of the firm have been referred as an ecocide, contamination of watersheds, pollution of air and destruction of the historical heritage. The inhabitants of these communities supported by environmental groups and NGOs argue that the project will pollute sources of fresh water besides of perturbing the environment and the ecology of the region.

According to the company Minera San Xavier (MSX), the 100%-owned Cerro San Pedro gold and silver heap leach project is located in the historic Cerro San Pedro mining district in the State of San Luis Potosi, Mexico. The presence of MSX in Cerro de San Pedro has caused a severe social conflict among the inhabitants of San Pedro, Soledad y San Luis and has called the attention of all who are concerned by historic heritage, cultural and environmental issues.

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Expressions of the compact city paradigm in peri-urban planning across European city regions – how do planners deal with sustainability trade-offs?

In discussions among researchers and stakeholders in the PLUREL research project it was clear that the compact city paradigm has become a leading concept in the planning of peri-urban areas (the transition zones between 'urban' and 'rural' areas). In planning practice the compact city paradigm seems to be considered synonymous with 'sustainable', because of claims that include lower emissions and conservation of the countryside. The literature shows, however, that there are certain trade-offs in striving for compaction, especially between environmental and social aspects of sustainability. In this paper, we describe expressions of the compact city paradigm in the planning practice of several European urban sample regions, as well as phenomena that contradict the compact city paradigm. Furthermore, we look at examples of positive and negative impacts of the compact city that were observed in the sample regions, as well as attempts by planners to deal with sustainability trade-offs. Being aware that developments in the peri-urban areas are closely connected to those in the inner city, we compare the sample regions in order to learn how the compact city concept has been used in planning peri-urban areas across different contexts in Europe: in Western, Central and Mediterranean Europe, and with growing, stable or declining populations. We conclude with recommendations on providing 'checks and balances' for the sustainability of the compact city concept.

Antoine Zammit
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Does scale affect the presence of the urban-rural interface? Managing this interface on a small island state: the case of Malta

The Maltese Islands offer an interesting, albeit complex, urban scenario. As settlements grew and their older inner cores spread outwards (at times sporadically and, more recently, speculatively), neighbouring localities fused together. Rampant post-war development changed the face of the urban-rural fringe that had existed up till then, and contributed to establishing Malta as one of the densest countries worldwide.
Today, these fringes have almost disappeared; rural areas have become peri-urban areas and it is has become almost impossible to distinguish the different scales and interfaces that compose the urban-rural spectrum. Where it happens, the urban-rural fringe is simply an urban extension for speculative property and further urban sprawl.
Unfortunately, international knowledge on the subject is not always applicable to small states such as Malta, primarily due to different scale definitions. This paper starts by identifying the limitations of international case study application, and attempts to answer the questions "How do you reconcile urban and rural when their fringe does not exist?" and "Is the urban-rural fringe a conservation zone to be protected, a transition zone or a distinct zone in its own right?" In Malta's case, this debate demands looking at the urban design aspects of the built environment and the architecture that characterises urban-to-rural.
Urban design plays a limited role on the Maltese planning agenda; numerous urban design policies, principles and elements are absent from site-specific Local Plans (at the macro scale) and the building-based Development Control Policy and Design Guidance documents (at the micro scale) produced by the Malta Environment and Planning Authority. The results of this deficiency in the Maltese planning system are reflected in the ever-increasing incompatibility of environments, as the dense urban fabric becomes more complex with increasing projects and continues to spread outwards to the detriment of both the inner urban and the surrounding rural structures. The paper asks whether the urban-rural fringe should in fact be a transition zone of architectural typologies. Also, what should this architecture reflect – should it follow on from the inner urban or outer rural area or should it be a distinct archetype? Thirdly, how is the current planning system shaping this debate?
Can we therefore establish some pointers for the future? How can we rethink our current policy-making? Does this discussion have wider implications on the planning system per se? And how can a small island state contribute to the wider European debate on the urban-rural interface?

PLUREL

Topic 8

Sustainable Multifunctional Landscapes in Peri-Urban Areas

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Landscape as silent conflict

Landscape can be viewed as an integrating, holistic concept, which helps bring diverse disciplines to a common arena where shared problems can be realised. Yet at the same time landscape is an arena where competing values and interests create conflict. Increased complexity and diversity of functions within peri-urban landscapes heightens the possibility for tension between competing values as they vie for limited resources. In order to manage the landscape resource sustainability there is a need for tools which can address this multiplicity of values. As landscape is considered more than just a physical entity, the perception of landscape is as relevant as its physicality and should therefore be recognised when considering landscape issues. This requires the inclusion of the public, those who possessing a 'life-world' attachment to the place. Yet as the public has many voices the potential for conflict through the diversity of perceptions and values is heightened. Within planning, the focus of theory and practice has shifted towards processes for alleviating conflicts, changing impetus from traditional technocratic practices towards more inclusive and participatory processes. It is widely realised that for successful participation within planning, inclusion should be instigated as early as possible. Additionally it is viewed that the public need to be seen as central to any debate concerning future planning issues relating to landscape. However public involvement is generally considered once the planning process is underway, at which stage conflicts have been ignored or overlooked within the rhetoric surrounding decision making. These are issues which need to be considered before the fundamental decisions are made, understanding differences before they escalate into conflict. This points to a need for attaining the multiple perceptions and values attached to the landscape at the assessment stage. At present most landscape assessments tend to be professional driven appraisals, where the insider perceptions are often overlooked. To consider these insider views requires a change of democratic practices within planning. Where as at present general consensus is considered desirable, at the assessment stage it is perhaps deeper understanding and realisation of the existence of conflict of values and perceptions rather than accordance which is most suited. To be relevant issues of perception require equal standing with more scientific aspects, such as ecology. Yet as there is no accountability built in to participatory methods, it is difficult to legitimise. This paper will highlight the relevance, and consider tools for increasing openness, reflexivity and transparency within participation as a way to enhance legitimacy.

Sandra Camicia
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The periurban area of Perugia. A strategic scenario of sustainable landscape planning

Effective planning in periurban contexts rests on interdisciplinary understanding, which incorporates physical, economic and socio-cultural dimensions and paradigms.
In this complex view, the research on periurban area of Perugia that spreads in Tiber Valley, developed a strategic scenario: a governance instrument that defines an integrated system of structural interventions, some priority themes of project and guidelines for action spatially-based.
On the basis of a complex and integrated information system (about settlements, infrastructures, agricultural land use, ecological network, water system), policies of protection, enhancing and exploitation of landscape resources are proposed.
Some hypothesis are put forward, identifying a number of important issues and solutions for a sustainable landscape: the improving of agriculture by inventing new modes and rediscovering traditional modes of providing for the urban population; the restoration and reconnecting of the ecological network, both reinforcing the main corridor along the valley floor and restoring the minor interconnections hill-plain (drains, hedges, small woods,...); the restituition to the river of taken away spaces for building activity in order to provide new recreational and ecological functions (wetlands), contrasting the traditional hydraulic operative model based on a technological approach; the increasing of availability and visual fruition of peri-fluvial spaces; the weakening of settlement pressures (residential, industrial and commercial development) on natural and cultural resources, not only major architectures or exceptionals ecological sites but also less significant materials and diffuses signs or marks of social practises whose memory survives anyway in the perception of local community.
After all, to aim a new integration between this wide peri-urban area, the historical centre on the hill and its other suburban developments, the scenario defines a network of slow mobility road-connections, pedestrian or cycling (that intercepts main landmarks, draws thematic ways of their perception, reconnects public facilities and services, enhances historical itineraries), and a large scale accessibility system based on public rail transport.
In the complex, the results (illustrated in the poster) are both methodological and applicative, but also of participatory nature, in order to actively initiate a process of sharing the aims, inspiring the involvement of the local community and main actors of the decisional arena.

Ole Hjorth Caspersen
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Peri-urban Lifestyle farming

The recent changes in Danish agricultural legislation combined with the economic crisis are expected to speed up the current structural changes, resulting in a polarised structure of very large and very small farms which can not uphold an economically sustainable agricultural production. The current landscape impacts caused by these structural changes have reduced the ecosystem services and resulted in loss of cultural and recreational values as access to the landscape has been reduced due to increasing field size, lost access paths etc. The forthcoming structural development may result in farms that are sustainable from an economic point of view, but offer a rather poor contribution to sustainability when including the broader environmental and social perspective. Moreover, common issues that relate to intensive farming in peri-urban areas are conflicts caused by pesticide and slurry application, smell, noise, and competition for resources such as farmland and water. Hence this presentation departs from the assumption that traditional, highly intensive, large-scale farming that target the global market is not very suitable to peri-urban regions. The peri-urban area is often characterised by a mosaic of intensive production, hobby farms, spare time farmers, housing and businesses. Some of these farms can be defined as Lifestyle farms oriented towards the nearby urban region. These farms differ from hobby and spare time farmers by being economically sustainable besides being sustainable from an environmental and social perspective. Lifestyle farmers have deliberately chosen a way of living in which production of high quality agricultural and horti-cultural products are in focus as well as production of other services aimed at the local area. This presentation claim that Lifestyle farms in the peri-urban areas can be an instrument to meet recreational demands by providing better assess to the landscape and by generating new ecosystem services, hence they may also contribute to the improvement of the health condition for the urban population. Future development in the peri-urban area will be influenced by economic, social, political, cultural and even psychological factors, and if provision of recreation and health services provided by Lifestyle farms shall be successful the conditions for such farms should be improved and facilitated. Finally the presentation identifies barriers and potentials for Lifestyle farming and suggests inputs for future planning legislation and agricultural policies that can strengthen the potentials.

Lunella Ferri
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Historical roots, structures and changes in fluvial periurban landscapes. Settlements, infrastructures, land use in Tiber Valley of Perugia.

In the European context, periurban landscapes have assumed a rising importance in recent planning activities, in relation to new spatial configurations resulting from socio-economic change and urban dynamics of deconcentration/reconcentration of inhabitants and firms.
Today, in periurban landscapes, new architectures (shopping centres, touristic buildings, industrial plants, new agricultural equipments) arise in addition to pre-existent historical structures, placing each one close to another one, between productive or derelict agricultural lands. Land use situations of great mixture, instability and conflict take shape, increasing environmental degradation and spatial decay.
In this framework, the research on periurban area of Perugia (62.700 inhabitants, 83.000 a.) knows morphologies, structures and changes of landscape, exploring the complex and critical relations between settlement, infrastructure, open and agricultural spaces, water system, and suggesting three empirical categories at different scales: system, ambits, places.
In particular, the research highlights the changing role of the Tiber river that has historically conditioned the organization of human settlement and agricultural practices. In fact, the river has been "principio insediativo" for the location of mills and fulling-mills, with their canal system and equipment, and, later, for the location of hydroelectric plants and productive manufacturing plants. In the same time, the necessity of crossing the river asked the construction of bridges which had attract settlements and other spatial infrastructures. The river had also contributed to develop culture and social identity of local communities. But, during the time, the river has lost his complex mophogenetic function.
The research identifies the other historical roots of landscape, in particular the way in which the road infrastructures and the ancient architectures (farmhouses, abbeys, churches, mills...) influenced settlement development. It recognizes the signs of traditional agricoltural landscape and the network of ecological values, projected onto the background of the main geo-morphological determinants of the physical environments in which they took shape.
On the whole, to construct significant topologic relationships and quali-quantitative indicators of density and fragmentation, discontinuity of built-up areas, agricultural soil consumption, land use dynamics, eco-mosaic and ecological connectivity, the research defines a complex information system (implemented in GIS) using a survey on the field, different statistical and cartographic sources, experimental tecniques and metodological instruments (including 3D rendering).

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Peri-Urban Planning & Management Challenges: Addressing the Myths of Peri-urbanisation

Managing the rapid and unabated growth on the fringes of our metropolitan and urban centres has been a longstanding challenge. Unfortunately, these areas have not attracted the same degree of attention as urban areas, from researchers, policy makers and planners. Consequently, planning and policy initiatives associated with attempts to manage these fringe or peri-urban areas ('peri': around, about or beyond) have not been informed by a relevant understanding, supported by contemporary research, of the processes driving these changes and their management implications. Subsequently, a number of myths have developed around some key issues relevant to this growth phenomenon, ranging from what is driving this change, the impacts to the landscape, to uncertainty over planning and management responsibilities and governance.

This paper draws from recent research into peri-urbanisation in two Australian states. The research project, Change and Continuity in Peri-urban Australia, aimed to help redress this relative lack of attention given to peri-urban regions in Australia and to contribute to a growing international literature on this subject. The study's key outcomes were: a redefinition of the peri-urbanisation process; an extended typology of peri-urban spatial settings; recognition of a 'new settlement' concept for peri-urban landscapes; a typology of new peri-urban landscape managers; and the conceptualisation of peri-urbanisation cycle for holistic landscape management.

These research outcomes provide greater clarity of the contemporary peri-urban processes and their drivers and can potentially lead to improved and more robust planning outcomes for these fringe areas experiencing high levels of non metropolitan growth and part urbanization through closer subdivision, fragmentation and land use conversation of its former rural lands that has resulted in a blurred mixed zone of urban and rural activities exhibiting a high degree of heterogeneity, continual change and conflicting values.

The paper will address a number of peri-urban myths which have overarched much past planning and management of these areas – often to the detriment of existing and future residents, and especially challenging local governments who have borne the brunt of the most significant management challenges that have been associated with these peri-urbanisation processes.

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An analysis of interactions between farm households and their local economies: a story of the changing relationship between rural and urban areas?

Rural sociology has a substantial literature on farm households and local economic development, much of it stemming from Goldschmidt's hypothesis on the socially detrimental effects of large scale farms and industrial agriculture (Goldschmidt, 1978; Hoggart, 1987; Lobao and Stofferahn, 2008). In the European context the relationship of these households to their local economy is undergoing major changes, both as subsidy regimes are altered and as the economic structure of households themselves is altered with more diversification into non-agricultural activities and off farm work. One sign of this is the increasing spatial complexity of the markets within which farmers and farm households operate: farms and rural households are increasingly interacting with more distant urban areas and global markets.

Econometric data from a spatial tracking survey of 226 farm households in the north east of Scotland suggests that the ties of farm households to their local economy are variable. Consistent with expectations, farm size, type, attitude to risk and degree of community attachment are found to influence the magnitude of income and expenditure retained within the reach local urban centres, how much and what type of flows extend further afield. Local is defined in this study by the USDA convention as being within the market reach of the nearest major town (USDA, 2008). It is suggested that, in line with US findings, large farms are principally connected to local economies through their production activities, whilst small household enterprises are more comprehensively tied through both farm-related activities and off-farm business and employment. Off farm work is shown to be an important element in sustaining the farm households and local communities. The paper considers these findings in relation to an increasingly fuzzy rural-urban interface in areas where there is a significant employment opportunity offered in alternative urban-based industries, such as the oil industry complex based in the city of Aberdeen in the north east of Scotland. This is considered in the context of proposed changes in farm support policy.

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Agro-urban open space as a component of agricultural multifunctionality

In this research a new concept, "agro-urban open space" is presented like a multifunctional component, showing a different contribution level of agro-urban uses to the generation of open space.

The mixture of elements, land uses and driving forces existing in an agro-urban landscape (a more complex concept than the classic and extended peri-urban concept), constitutes an innovative subject for planning. Nevertheless, the agricultural landscapes in general have been sparsely considered in local planning in Spain, which is mainly focused on built areas and land for building. Furthermore, open space is not an easy concept in planning and is usually redefined depending on specific goals or study areas.
Within this context, multifunctionality (1) can help to consider new dimensions and values in agro-urban landscapes through a new cartographic method useful for agro-urban open space planning. In this sense the multifunctionality have been studied on agricultural spaces and in a wider concept of landscape but not cartographically represented.

Aims and Methods
The main objective is to define and mapping the agro-urban open space in a Mediterranean Delta, on the basis that appropriate transition areas could enhancement the coexistence between different agrarian typologies and urban spaces and elements.

Elements, structures and functions in the agro-urban landscape are assessed in order to describe the contribution to the generation of agro-urban open space. The criteria considered for establishing the different contribution levels are related with:
- (Physical and visual) Accessibility
- Location
- Connectivity
- Hierarchy
- Level of intervention
- Design

The final obtained cartography is expected to be a new tool for supporting decisions in open space planning in general and in agro-urban areas in particular.

(1) A general definition of agricultural multifunctionality is provided by OCDE (Multifunctionality. Towards an analytical framework. OECD Publications Service, 2001): "the functions and benefits supported by agricultural activity and usually considered non-commodity products"

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Land Degradation and the City: Environmental Sensitivity and Regional Disparities in a Changing Economic and Ecological Landscape

The aim of this study is to discuss the role of some environmental and human-derived factors as potential drivers of land sensitivity to degradation in the Mediterranean cities, as a result of the territorial disparities and the uneven distribution of human settlements. In order to provide an empirically-based background for such a discussion, a synthetic index estimating the level of land sensitivity to degradation (ISD) was calculated at the municipal level (1970-2000) and its spatial distribution was analysed in a paradigmatic case study (Latium, central Italy), which is a typically-Mediterranean urban region. The ISD was composed of nine variables quantifying the climate and soil qualities, land use changes, and population growth. Regional disparities in the ISD were studied along defined bio-physical and socio-economic gradients. Results of this study indicate that the divergence existing in the ISD distribution widens over the investigated period and is spatially related to the different models of urban organization considered. A high level of land sensitivity was found in urban and peri-urban areas along the coast, which also showed the highest increase of ISD over time. An important contribution to this growth was attributed to the socioeconomic factors including the planning choices, the population growth, the sprawl of built-up areas outside the dense city, and the intensification of the agriculture along the fertile coastal zones. These findings further suggest a rethinking of the meaning and potential application of the polycentric model as environmentally sustainable for Rome and similar Mediterranean cities.

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Landscape urbanism for old industrial peri-urban areas

The tendency for planning agenda to focus on the building structure at the expense of ecological elements has led to the abandoning of peri-urban areas, such as the old industrial areas. This article presents a landscape urbanism project for the city of Covilhã (Portugal) centred on the ecological element of the stream of Carpinteira, which crosses the city. The purpose is to rethink this area, nowadays a place increasingly in decline and in the past a dynamic part of the city. The project aims to present landscape urbanism strategies designed to promote the return of citizens to this forgotten area, by integrating the ecological structure of the Carpinteira and the old industrial buildings as landmarks for urban sustainability. The project has designs a riverside walk as a landmark of the urban design proposal that combines ecological elements and the old industrial building structure in a relationship of sustainable use. The objectives are to propose measures of landscape urbanism to integrate and enhance the old industrial buildings / ecological component, promoting multifuncional activities; to create leisure areas with a riverside walk and an ecological corridor to ensure the environmental balance of this area; to promote the integration of the Carpinteira stream within the city; to allow the rehabilitation of old industrial buildings; to qualify the urban image. In summary, the project presented could be an example which would contribute to valuing the ecological component of the city and promoting urban sustainability.

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Multifunctional Perspectives of Peri-urban Agriculture – The Example of Horse-keeping Farms in the Berlin Metropolitan Region

Since the fall of the wall and the deliberation of Berlin from its insular location, the region looks back on two decades of a common Metropolitan development, where the urban growth tremendously affects the agriculture in the peri-urban area. Increasingly farming activity is faced by urban pressure, operational limitations and competition for land, but also certain development opportunities due to the increasing urban-rural-interaction and demands for rural goods and services. Peri-urban agriculture in the region, however, has already responded as it has adapted and diversified activities according to these urban demands.

Based on the examples of direct marketing horticultural farms and equine service-oriented farms in the Berlin peri-urban area, the farmers' perspectives and viewpoints on the locational framework as well as on the multifunctional strategies followed to cope with and gain from the urban proximity are assessed. Potentials and approaches to support multifunctional transition of agriculture as an integrative element of a peri-urban landscape are explored.

Methodologically, the study makes use of a comprehensive empirical survey and in-depth interviews with selected farms. First results confirm that the particular peri-urban conditions are acknowledged by diversification activities taken by farms – in its effect as strengths and weaknesses. It is shown, that the farms developed a multitude of strategies to respond to these conditions.

PLUREL

Topic 9

Economic Evaluation of Policies Affecting Land Use in Rural-Urban Regions

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Monetary valuation of land use policies: attribute non attendance in choice experiments in Leipzig, Germany

Ex-ante evaluations of policies affecting land use in urban and per-urban areas may provide useful information to policy makers. Discrete Choice Experiments, a survey based technique, is a useful tool to elicit citizens' preferences, as respondents face hypothetical but realistic scenarios and are asked to choose their favourite. With this technique it is indeed possible to estimate how much citizens are willing to pay for a particular change in each attribute of the hypothetical policy being evaluated.
In Choice Experiments, respondents, following their own heuristic, might not consider all the attributes of the proposed hypothetical policy, a problem known as "attribute non-attendance". Not accounting for non-attendance when attributes are actually not considered by some respondents can result in poor fit of the estimated model and biased welfare estimates.
A number of studies have looked at attribute non-attendance, but not many, probably due to computational challenges, have focused their efforts in willing-to-pay space. Models in willing-to-pay space are appealing as they allow to calculate willingness to pay estimates assuming that the random parameter for the cost coefficient may take on a continuous distribution (or vary with the scale factor of the underlying Gumbel distribution).
In this paper the implications of attribute non-attendance in willing-to-pay space are explored in the context of a choice experiments study designed to value the effects of ex-ante land use policies in Leipzig, Germany, within the context of the FP6 Integrated Project Plurel. We focus on four effects of land use policies: (i) improvement in air pollution from transport; (ii) protection of cultural heritage monuments; (iii) development of new housing in green open spaces; (iv) development of new housing by refurbishing idled buildings, hence protecting green open spaces.
We investigated citizens' preferences and willingness to pay, expressed as a one-off tax, for the four effects by administering a choice experiments internet based questionnaire to a sample of the population.
Taking into account attribute non-attendance we find that our model fit improves and tends to lead to important changes in welfare estimates. Potential implications for policy making in peri-urban areas in Leipzig are drawn.

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Preferences for land use Policy Interventions: The role of home ownership and participation

Policies involving land use decisions are of strategic importance for local administrations. Policy makers are therefore often interested in gaining an insight of the public's preferences for the effects of those planned policies, as well as assessing how much citizens are willing to pay for their implementation. Stated preferences, such as Contingent Valuation and Choice Experiments, can be used to assess the ex-ante effects of land use policies. Choice experiments are a survey based technique where respondents face hypothetical but realistic scenarios and are asked to choose their favourite. A weakness of stated preference methods is that they are prone to hypothetical bias ("the potential error induced by not confronting the individual with an actual situation" Schulze et al. 1981).
Several authors, mainly in the context of Contingent Valuation, have used a 'cheap talk' – A script that explicitly highlights the hypothetical bias problem before participants state their preferences - to tackle hypothetical bias. Within the Discrete Choice Experiment literature few authors have used it and, when used, the script included was longer than the ones normally used in Contingent Valuation. Results from the use of cheap talk in choice experiments have shown that there is a decrease in Willingness to Pay (WTP), but there is little evidence that this decrease in WTP is actually due to the fact that the cheap talk had increased respondents' attention to their budget constraint (with larger coefficients in absolute value for the cost attribute) or that the cheap talk had actually biased respondents to favour the status quo alternative.
In this paper, using split sampling, we contribute to this literature by applying different cheap talks in a choice experiment survey to test the impact that cheap talks have on the choices of people. We test our method in a choice experiments survey in Warsaw that looks at the effects that land use policies have on (i) improvement in air pollution from transport; (ii) protection of cultural heritage monuments; (iii) development of new housing in green open spaces; (iv) development of new housing by refurbishing idled buildings, hence protecting green open spaces. When comparing three different cheap talks we find that short and long versions of a cheap talk before the choice task have different impacts on preferences and on attendance of attributes. We conclude that care must be used when designing cheap talks and suggest an approach to reduce hypothetical bias.

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Monetary valuation of peri-urban land use change: A tale of three cities

Most public policies affecting land use decisions entail a cost to society, in terms of higher taxes, higher prices, or reduction in the provision of other public goods and services. When considering new land use policies, it is therefore useful to gain an insight of the public's preferences for the effects of those policies, as well as assessing how much citizens are willing to pay to implement those changes. Using Choice Experiments – a survey based technique – we investigate public preferences for the effects of hypothetical but realistic policies affecting land use at the urban and peri-urban level. This paper reports the results from The Hague.

After initial analysis and discussion with stakeholders about the most important effects related to land use policies, we focused on four selected effects that appeared to be relevant in The Hague: (i) improvement in air pollution from transport; (ii) protection of cultural heritage monuments; (iii) development of new housing in green open spaces; (iv) development of new housing by refurbishing idled buildings, hence protecting green open spaces. We investigated citizens' preferences and Willingness To Pay (WTP), expressed as a one-off tax, for the four effects by administering a choice experiments internet based questionnaire.

Results show that respondents in The Hague consider more important improving air pollution and protecting cultural heritage monuments than solving housing problems. The results also indicate how much residents in The Hague value the different effects of land use policies. Thanks to the widespread distribution of the internet in the country, we have been able to achieve 50% of the sample in urban area and 50% in peri-urban area. Respondents living in urban areas are willing to pay €55 to improve air pollution and €25 to protect cultural heritage monuments. Respondents living in peri-urban areas consider air pollution more important than those living in urban areas, but they are less concerned for the protection of cultural heritage monuments than urban residents. Indeed, peri-urban residents' WTP for decreasing air pollution from transport and for protecting cultural heritage is €60 and €10 respectively. Potential implications for policy making in peri-urban areas in The Hague are drawn.

Gabriel Pons Rotger
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Effects of agglomeration economies on labour market and earnings

This paper investigates empirically a key factor for the localization of economic activity and regional policy making: the strength of industrial clustering. Concretely, the paper estimates by means of micro-econometric advanced methods the impact of industrial clustering on the wellness of both workplaces and individuals. This is done on the basis of longitudinal employee-employer matched data based on 100% workplaces and 10% of employees in Denmark in the period 2004-2006, which among other important covariates includes precise measures of distances between workplaces. The paper is composed by two interrelated empirical analysis:

- The first analysis estimates for different relevant industries the strength of agglomeration economies by means of panel data method.
- The second analysis uses micro-evaluation method to assess the impact of agglomeration economies on job hopping and earnings effects for employees in local labor markets.

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Interaction of geographical clustering of economic activity and local labour market dynamics

This paper investigates empirically a key factor for the localization of economic activity and regional policy making: the strength of industrial clustering. Concretely, the paper estimates by means of micro-econometric advanced methods the impact of industrial clustering on the wellness of both workplaces and individuals. This is done on the basis of longitudinal employee-employer matched data based on 100% workplaces and 10% of employees in Denmark in the period 2004-2006, which among other important covariates includes precise measures of distances between workplaces. The paper is composed by two interrelated empirical analysis: The first analysis estimates for different relevant industries the strength of agglomeration economies by means of panel data method. The second analysis uses micro-evaluation method to assess the impact of agglomeration economies on job hopping and earnings effects for employees in local labour markets.

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The Common Agricultural Policy (CAP) and regional planning: a study of a contradiction. The case of the south peri-urban area of the city of Girona, Catalonia

Over the past twenty-five years the CAP has caused significant economic and social mutations in the agricultural area. These political strategies have often favored the industrialization of agriculture activities, overcoat cattle specialized in the production of milk with the incorporation of technology to save labor, encouraging its dependence on the predominant agribusiness. Transversally, the development of these activities, which require a large land base to produce animal feed, gets limited by the territorial and urban planning regulations, which in some cases encourage an agroterritorial transformation and in others generate constraints on the farm factors of production. This becomes emphasized in peri-urban areas, too often threatened by their dynamic and unstable character.

This paper aims to describe it this dynamics, firstly diagnosticating of the peri-urban area of southern Girona from the public subsidy payment of the CAP, and secondly, categorizing different forms of periurban areas by means of a planning study. The ultimate objective pursued is to study the effects on the agroterritorial matrix about competitiveness in the dairy sector in the implementation of various directives to identify synergies and possible contradictions and establish guidelines to improve the complementarity of both policies.

The study area covers an area of 537.5 km2 in the northeast end corner of Catalonia (Spain). It includes 18 municipalities that cover two alluvial plains with long tradition in agriculture, crossed from north to south, by the main roads (N-II, AP7, HST), as wel as by infrastructures (airport and MAT), first class facilities and services (CIM, PIF).
The study brings together seventy farms specialized in bovine milk of which some stand out as highly productive, well-sized and very dynamic when referring to business and transformative strategies based on sustainable criteria such as: Llet Nostra, ATO Natura, organic milk for schools, milk vending machines which along with the dairy cooperative Campllong -with experience as a bank-land- are the real protagonists of how to reverse the market behavior. In addition, these dairy companies are complemented with about forty farms that ensure grain and forage to feed the cattle. Within this framework of analysis various alternatives are discussed to improve the management of these agricultural areas.

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Economic Assessment of Peri-Urban Land Use Change: Application of cost-benefit analysis to case studies

Changes in peri-urban land use involve a number of actors and impacts. The need for a methodology to assess the impacts, including consideration of irreversibility, leads to the use of cost-benefit tools and the application of real option approaches in the appraisal. The method is tested in a number of interesting case studies around Europe, drawing on the PLUREL project. The case of the Hague and Manchester are developed in great detail – with the case of the Hague being the linking of green spaces in the region and that of Manchester being peri-urban development options in the South Pennines and Mosslands areas. Areas for further research are presented, along with discussion for the potential for the use of economic instruments in the peri-urban context.

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Transport Infrastructure as a Key Determinant in Regional Growth Trends in Plurel Regions

This paper explores the land transformation process and growth pattern emerging in the functional urban regions of Europe with particular attention paid to growth impacts on peri- urban areas. The process is considered in the light of the growth pattern of selected Plurel Regions which is analysed based upon international economic and social statistical evidence. Provision of *transport infrastructure* as a critical determinant of growth pathways will be examined.In the last decade in particular the emergence of discontinuous patterns of development and rapidly expanding functional urban areas has been observed in many developing city regions. Evidence of contrasting trends have emerged with an urban regeneration driven return of development to central areas of economically strong regions, and a concurrent significant dispersal of housing and employment activities development in a sprawl type manner. In turn, in regions with lower levels of economic growth a gradual dispersal of development into peri- urban areas has occurred potentially weakening central core areas. It is recognised that dispersed patterns have significant implications for the long-term regional development patterns of Plurel Regions. Therefore, this paper will include empirical evidence on development patterns emerging, which it is expected will assist in evaluating the effectiveness of policy measures. In addition the paper will focus on policy support evaluation measures relating to the Cost Benefit Analysis tool in assisting the evaluation of new transport infrastructure proposals.

PLUREL

Topic 10

Instruments and tool for Sustainability Impact Assessment

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Instruments and tools for the management of geospatial data in the PLUREL project

In the PLUREL FP6 integrated project, the work package on spatial development strategies and scenarios has established the primary spatial data infrastructure for the entire project. This infrastructure includes several components such as a data warehouse, a metadata clearinghouse and a geo-portal interface for discovering data or web services and accessing them in an integrated map viewer (http://plurel.jrc.ec.europa:8080/geonetwork).
The INSPIRE Directive adopted in 2007 mandates all Member States to comply with its provisions for geospatial data that are used in the context of environmental reporting obligations. The Directive aims at streamlining exchange and interoperability of data between institutions across Europe. Outputs of PLUREL and in particular results of modelling simulations (MOLAND) are particularly concerned.
As a Commission supported project, PLUREL had to take into account the Directive obligations in the perspective of enhancing access from stakeholders to data produced by the project. The necessary steps towards compliancy included the documentation of geospatial data with detailed metadata, their publication as network services for discovery and view purposes and the adoption of a data policy framework by the project partners.
The paper explores the interrelations between the different components of the PLUREL data infrastructure and how it contributes to improved access to and exchange of land use modelling in a distributed environment. It includes the potential links between the existing spatial data infrastructure and the new PLUREL XPLORER integrated result exploration tool.

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The PLUREL Xplorer - Developing an information platform for rural-urban land use relationships

Addressing land use relationships in the rural-urban perspective implies the analysis of land use changes and their impacts on the human quality of life and the environment. For decision support, a better understanding of these changes and the respective impacts on sustainable development is essential. To structure the complexity of these processes, tools are needed that facilitate the ex-ante assessment of land use and planning decisions in the rural-urban continuum. Here, the identification of effective strategies based on knowledge management and transfer is essential to improve our knowledge of rural-urban interlinkages.
This paper presents the PLUREL Xplorer, an integrative framework for research on rural-urban interactions. It appears as a web-based online information platform for users interested in processes of peri-urbanisation and the respective relation to sustainable development. Fed by a web-based data management system and GEO-portal, the PLUREL Xplorer supports the dissemination of principles, processes, problems and places of European peri-urbanisation processes also on the regional scale. It assists policy makers and practitioners in analysing urbanisation processes and trends in European regions, and provides them with support in the development of strategies for better guidance of these processes. Further targeted user groups include planners, stakeholders, scholars and researchers dealing with rural-urban interactions and sustainable peri-urban development.
One challenging task of developing a concept for such a tool is the integration of a broad variety of input factors that have to be taken into account. The advantage of the PLUREL Xplorer lies in the condensation and configuration of knowledge produced within the PLUREL project into a format that is of use for further application. The PLUREL Xplorer aims at supporting planning and policy discussions on rural-urban land use interactions at European and at regional level. Focussing on causal-chain relationships between drivers, changes and impacts of urbanisation, it supports planning and policy discussions. The PLUREL Xplorer combines textual background information on rural-urban interlinkages and the processes of peri-urbanisation with a number of applications that allow for the assessment of impacts on and of rural-urban interlinkages and the respective land use changes. Precise, illustrated fact sheets guide the user through the particular knowledge and allow for the direct download of sophisticated background information in form of reports, figures, maps, sketches or else. Interactive design elements support the intuitive comprehension of causal interrelations between these knowledge bits. This paper presents the conceptual approach of the PLUREL Xplorer and gives further insight into the analytical cascade that structures the gained knowledge on rural-urban interlinkages.

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A method to assess transport consumptions in suburban areas

The process of urban sprawl is familiar in many European urban regions, and particularly in the Walloon region of Belgium. It represents a significant contribution to global energy consumptions, as far as building energy but also transport needs are concerned because, in these kinds of residential neighbourhoods, car ownership is high and public transport generally available at low frequencies. However, transport consumptions are rarely taken into account, when the sustainability of suburban structures is studied.

The paper first presents the specificities of the Walloon context, as far as urban sprawl is concerned. The method developed to assess the transport system in Walloon suburban areas is presented. Four goals are taken into account: travels to work, to school, for shopping and for leisure purposes. Statistical data's available at the neighbourhood scale, "type" profiles and characteristics of cars and public vehicles are used to anticipate transport needs and assess consumptions.

An application of this method is presented concerning the comparison of the influence of parameters which are often underestimated, like location of the neighbourhood, distance to city centre, access to local public transport, accessibility to shops and schools, etc. to allow a range of different development situations to be explored. The results of this exercise are finally presented. Its limits and its adaptation in other contexts are discussed.

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The Indicator of Land Consumption Risk (ILCR): a methodological approach to manage periurban areas

Periurban areas are constantly subjected to the pressure of urbanization and the permanence of agriculture is the most important mean against soil consumption, but only competitive farms can protect green open spaces competing with the urban growth and sprawl. Soil is a non renewable resource because the time of degradation is quick, but the regeneration process, when it is possible, is very slow (EC, 2006). The permanence of agriculture can play a fundamental role for the economic and environmental sustainability of local development.
This work considers the farm as the unit of analyses and, finding different factors which influence the efficiency of farms, creates an Indicator of Land Consumption Risk (ILCR), that measures the vulnerability of periurban areas. Factors could affect the farm in relation to the soil loss both positively, if they back up and promote the farm performances, and negatively, if they reduce farm functionality. At the same time, the factors could be endogenous, if they depend directly on the farm management, and exogenous, if they depend on external pressures.
By integrating and summarizing these factors an Indicator of Land Consumption Risk at farm scale was created and a Spatial Multicriteria Analysis approach based on GIS technologies was used to produce maps showing different levels of risk consumption due to fragility of agriculture. This methodology is based on economics and social data at farm and municipality scale and propose different kind of scenarios, projecting the effect of chosen policy on the land.
The study area is the Province of Milan, Lombardy, Italy, where competition between urban and rural areas, property speculation, demographic pressure increase the land consumption risk and are threats to the existence of the peri-urban agriculture. The average rate of urbanization is around 35% in the whole province, in the municipality of Milan it's around 69%, but in some areas it reaches the 82%, especially in the North of Milan (ONCS, 2009).
Main result of the work is the Map of Land Consumption Risk of the Province of Milan that identifies the areas where fragility of agriculture and land consumption risk are higher.
ILCR is a new instrument of governance to manage green open space in periurban areas where agriculture has particular features due to her relationship with the urban place. This tool could be an important support to policies and institution to planning and government of periurban contest.

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The PLUREL Xplorer – Technical Implementation of an Information Platform for Rural-urban Land Use Relationships

The PLUREL project dealt with the complex rural-urban land use relationships observed in the larger European cities of today. Many scientists from different research fields examined this complex matter and tried to find patterns in the development of these regions. In doing so they created a variety of different products (scientific texts, models, simulations, GIS maps, graphs etc.) which were elaborate but not directly linked to each other, which made it hard for a non-project participant to follow the point PLUREL tried to make. Since PLUREL's results were planned to be used by stakeholders working in the rural-urban context, there was a need for an information dissemination platform that would present PLUREL's results in a well structured, comprehensible way, which would enable the users of the platform to explore and understand the peri-urban land use relationships in detail. This paper deals with the technical implementation of this dissemination platform and the rationale behind its technical concepts.

The design of the dissemination platform, called PLUREL Xplorer, is based on the fact sheet approach, where each problem that has been dealt with within a project is described by its editors in a condensed way to allow for a quick overview of a specific topic, while providing also links for further reading and more in depth information if desired. In this way the user can easily identify the nature of peri-urban problems and relationships.
To accomplish a user friendly and platform independent solution, the Xplorer has been designed as a Java Webstart application, running a PostGreSQL database on a webserver in the background. To upload the fact sheets to the system another Java Webstart application (web form) has been implemented, serving as an entry point for the different editors of the fact sheets. The upload web form offers facilities to directly enter HTML formatted text into text boxes for the 7 different subdivisions of the PLUREL fact sheets. It is also possible to upload file attachments in form of images, maps, tables and pdfs to the system which are later linked to within the Xplorer, in this way offering the possibility for further investigation of a specific topic. To display the linkages of the topics in a comprehensible way the fact sheets have been organised as a three level tree structure within the database which builds the basis for the Xporer's menu structure.

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Will the Strategic Environmental Assessment (SEA) Get an Effective Control of the Rural Development Programme (RDP) Effects on Rural Space Quality?

The main issue. The Rural Development Programme 2007–2013 (RDP), included in the second pillar of the new Common Agricultural Policy (CAP), is in progress and all over Europe Countries and Regions are implementing their own RDP (88 RDP in total).
The new concepts supported by the CAP would promote the multifunctional role of countryside and the new challenges of rural areas to the environmental protection and valorization: they recognize in the sustainable rural development an important role in facing climate change, water management, bio-energy and biodiversity. Through the new CAP the UE Commission has encouraged Member States to move more funds from production subsidies towards targeted measures which will improve rural landscape and biodiversity and to offer incentives to farmers to make environmental improvements. Moreover the recent Health Check of the CAP has shifted the emphasis even more towards protecting the environment and encouraging farmers to manage their land in a more environmentally correct way. In these perspective, if "forest and agricultural soil sealing" is the most direct and measurable environmental effect, the "agricultural land use changing" can be considered as a strong tool for improving the rural space quality.
The paper approach will address methodological issues, but will refer practical issues too. It will present the status of scientific debate and perspectives about the SEA implementation as tool for improving associated environmental effects of RDP on sustainability, based on both literature reviews and empirical experience in the implementation of SEA process for the RDP 2007-2013 of Piedmont Region (Italy).
The results. The paper will expose critical items and perspectives about the effectiveness of SEA procedure as tool for improving rural policy and valorising rural space and rural landscape, particularly where the rural landscape is so worthwhile that it can be proposed for the nomination as a World Heritage (as in Tuscany and Piedmont Regions in Italy). The contribution will discuss the doubt about the effectiveness of these tools that could compromise the expectations for a real change in rural development.
A special focus will dedicated to the baseline and impact indicators that can assess and monitor effects on rural space and to the participation process to involve all the actors, up to individual farmers, in virtuous policies, so that the rural space quality can be preserved and improved by the active collaboration of even individual actors.
The open questions. Some final considerations will be dedicated to the technical discussion about new SEA indicator proposal for monitoring RDP effects on rural landscape and to propose some items for the agenda about future research in the field.

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Integrating macro-economic developments and land use allocations in simulating urban dynamics

The proposition that land use dynamics are complex and exhibit self-organising behaviour may seem at odds with the prima facie assumption that planners and policy-makers have a decisive influence on future land use. In reality this is not a contradiction, but rather a challenge for modellers to recognize disparate types of drivers and look at autonomous behaviour and (spatial) planning as an integral part of the land use system.

A closer look at the drivers of land use makes it apparent that dynamics are driven by processes operating at various spatial scales. When focusing on urban environments there is interaction between cities, between neighbourhoods of the same city and at local level, although none of these processes operate in isolation. Bottom-up as well as top-down interactions play a crucial role in the overall dynamics. Socio-economic developments at macro level impact on the demand for residential, industrial and commercial locations, while the availability of suitable locations and the actual spatial configuration in turn impact on the overall socio-economic developments.

This paper presents an integrated spatial decision support system (ISDSS) for simulating dynamics in cities, for which early prototypes (developed in the first year of a six year programme) have been applied to Auckland City and Wellington, two cities that vary considerably in size and expected developments. The aim of this ISDSS is to support long-term integrated policy development and planning by taking into account social, cultural, environmental and economic developments. The system includes an ecological economic model to represent macro-economic developments, an age-cohort for demographic changes and a cellular automata based land use model for simulating the competition for space at local level and hence the spatial allocation. In the paper attention is paid to the conceptual strengths and weaknesses associated with the integration of the ecological economic, demographic and cellular automata land use models in our prototypes. This includes interactions between the various spatial scales and inclusion of policy-relevant drivers. In conclusion, we comment on possible pathways for refining, enhancing and improving the integration between these models.

The ISDSS is being developed as part of the Sustainable Pathways project and developed in close collaboration with the intended end users, the planners and policy makers from Auckland City and Wellington.

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Tools for urban soil management

Soil is a non renewable natural resource that performs many essential environmental functions in terrestrial ecosystems in rural as well as urban areas. Many sectors and society depend on soil functions like biomass production, water filtering and carbon sequestration. Good soil information is that for of major importance for sustainable urban development and management of urban ecosystem services. In general we are facing a lack of soil information for city areas, however when available these are difficult to efficiently interpret and use by non-soil scientists - planners. Quality soil information such as contamination etc. should that for be embedded in effective and end-user oriented evaluation/risk assessment tools.
Municipalities and research institutions from eight Central European cities (Stuttgart, Milan, Vienna, Prague, Bratislava, Celje, Pulawy and Turin) joined within the INTERREG Central Urban SMS project with a goal to verify and set strategies and to develop effective tools for sustainable and better environmental management of soil resources in the cities. The main focus of the project is to develop soil evaluation tools that embed the expert's knowledge and can be used by non experts - planners.
One of the main project's outcomes is the Urban SMS Manager Suite which consists of a) Desktop Urban SMS Tools - a computer based interpretation application of non-spatial soil-related information, and b) Web Urban SMS System - a GIS based portal that is used for interpretation, analysis, visualisation and modelling of soil and soil related data.
Within this project eight different tools will be developed and tested: Ecosystem Soil Quality to assess the environmental value of soils; Loss of Soil Resource to assist the planning decisions and to protect quality soils; Soil Contamination to steer the planning decisions towards lower impact of soil pollution; Sealing Rate to evaluate the importance of urban green areas; Agricultural Soil Quality to preserve best agricultural soils; Water Drainage to estimate the soils infiltration rate and potential water logging; Connectivity to evaluate the relationship between objects and their distance to green areas while the Proximity assists to assess the spatial and economic impacts of urban green. A special attention was paid to the flexibility of tools design. This was necessary to allow the adaptation of each tool according to the local data availability and interpretation rules, national legislation, soil resource quality and various threshold values.
The project is due in 2012. The presentation will give an overview of the WEB system and Desktop tool, both currently in beta version after the first stage development is finished and the implementation and testing with different datasets underway.

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PLUREL iIAT: A new tool for user specific analysis of sustainability impacts of urbanisation at various scales

The PLUREL integrated Impact Analysis Tool (iIAT) synthesises results from quantitative modelling of urbanisation and expected impacts on sustainable development on EU scale and for regional case studies. The tool enables users to conduct an integrated analysis of a year 2000 situation and different scenarios of future development under global change trends. Main purpose of the iIAT is to create awareness on how sustainability is affected at different scales for different types of regions and where policy action might be necessary.
The iIAT-EU covers 543 NUTSX regions of the EU-27. Users choose between an aggregated sustainability analysis considering a predefined set of indicators covering the economic, environmental and social dimension, and a free selection of indicators with relevance for urban-rural functions. The iIAT-Region displays results from regional case studies.
Physically, the PLUREL iIAT is an internet accessible tool that displays results in form of spidergrams, enabling an easy and holistic perception of multilevel information. The interactive nature lies in the possibility for an in-depth view into different thematic and regional scopes and different scales chosen according to individual user interest. The tool accesses the impact assessment result database, and generates the demanded outputs in the graphical user interface (GUI). The iIAT-EU and the iIAT-Region, covering two spatial levels. facilitate discussions for heterogeneous end user groups ranging from EU policy assistants to local planners. Collaboratively working with the iIAT facilitates learning processes about different views on land use development.
The iIAT allows the user to choose between a predefined list of nine sustainability indicators or a free combination of 3-12 indicators out of 30 indicators at NUTSX scale and 25 indicators at case study scale. In order to carry out comparisons, the user can choose either specific or groups of regions. Each NUTSX region is characterised by an urban structure, bio-physical, socio-economic and regulatory profile, resulting from attributes derived from the different typologies (e.g. rural-urban-region-type). In the iIAT-EU functionality they act as filter for generation of grouped average indicator values. The paper presents different examples of comparative analysis, to prove the value of practical use of the iIAT to assess regional sensitivity to scenarios, depending on regional characteristics. Particularities of peri-urban versus urban and rural regions will be highlighted. The in depth view into case study results will show the additional quality of spatially explicit impact analysis. During the conference a demonstration session will allow the audience to practically test the iIAT or to follow a live demonstration.

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Quality of Life Simulator – predicting residents responses to changing land use conditions

QoLSIM (Quality of Life Simulator) is a new form of predictive tool used to simulate the behaviour of residents under changing land use conditions where certain key aspects of quality of life are likely to be affected. Based on survey data collected in a sample of European city regions through the application of conjoint analysis, the simulator can demonstrate the predicted or simulated behaviour of different residential groups if levels of these key indicators are predicted to change as a result of land use change. The key variables, apart from suitability of the residence, are air quality, access to green space, access to transport, access to shops, safety and security, rubbish collection and noise pollution. The simulator can be used at a European level or as a generic tool or be loaded with data collected from a specific city region to provide a tailored solution. The land use changes predicted using modelling techniques can also be linked to the QoLSIM.

PLUREL

Topic 11

Sustainable Urban Development in Emerging Economies

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The Role of the United Arab Emirates Federal Governance System in Rural-urban Regions: Case Study Industrial Solid Waste Management.

United Arab Emirates (UAE) is a federation of seven Emirates; Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al Qaiwain, Ras Al Khaimah, and Fujairah. After the departure of the British colonization parts of the Northern Emirates were divided according to tribal loyalty and roles during the British Colonial era. When the UAE got its independent on 2 December 1971 the UAE Constitution left some issues (e.g. natural resources) for each Emirate to manage. Theoretically, two parties (federal and local) manage the interior economic sectors in each Emirate. Solid waste issues are managed by local agencies while general rules and laws are set by the federal government. Throughout the UAE there are more than 300 villages and small towns, mostly located in the northern part of the country. According to the UAE 2005 employee labor force survey 34% of the total UAE employed labor force works in the rural regions, mostly in the farming and small industrial sector.

Objectives
This paper's main objectives are to highlight the UAE industrial solid waste problems in the rural-urban regions. It also examines the complexity in managing this issue among the two authorities; the federal agencies e.g. Ministry of Environment and Water and local agencies at each Emirate in these regions. In addition, it highlights the role of small manufacturing units located at rural areas and generating several types of solid wastes. Final, the types of labor force and their environmental backgrounds are discussed in this paper.

Methodology
Due to the shortage in data related to hazardous waste in the rural-urban regions of the UAE, a small survey was designed and distributed. In addition several direct interviews were conducted with officials in federal and local agencies to examine the role of these two parities in monitoring the hazardous solid waste management in these regions.

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Riding the tiger: strategies for sustainable land use in peri-urban areas of rapidly developing cities of China. The case of Hangzhou.

The EU FP6 Integrated project PLUREL sought to identify strategies for sustainable land use in peri-urban areas and support the development of these by innovative methods and tools. The Hangzhou case study was selected as a complementary case to the European case studies because it gave insights into the challenges for peri-urbanisation in China and how these have been addressed by planning within a political and legal context fundamentally different from the European cases. In particular, the Chinese situation is characterized by the combination of strong top-down planning with a free market economy. Hangzhou was also interesting as the city has a reputation within China of advanced planning and development of innovative land use strategies.

Fuelled by strong economic growth, rapid urbanisation in China has led to unprecedented challenges for planning. For instance, in Hangzhou, a metropolitan area located in the Yangtze delta, of 290km^2 and 3.13 million inhabitants in the city proper in 2005, each year between 50,000 and 100,000 new inhabitants need to be accommodated. This population growth has led to the quick expansion of the urban territory. According to results from our study, the city core increased almost seven times, and the peri-urban zone expanded by 4.5 times in surface area between 1988 and 2004.

Three embedded cases were selected to study in detail the character of peri-urbanisation in different landscape and socio-economic settings within the peri-urban area of Hangzhou. Moreover, the cases represented distinctive strategic approaches to the management of peri-urbanisation:

- Culture & landscape restoration, tourism and residential development – case study area of Xixi
- Ecological conservation and controlled urban growth - case study area of Zhuantang
- High technology & economic development – case study area Binjiang

Overall, the development of compact and efficient urban spatial structures for the entire city region is among the major challenges encountered by planning. This requires containment of low density urban developments (“sprawl”). Urban sprawl is partly driven by municipal governments who sell land in order to increase local revenues. Reform of the taxation system is therefore recommended to benefit from land added values and economic development for the whole city. Moreover, coordination between spatial planning and development policies needs to be enhanced. Establishing efficient governance is a great challenge in peri-urban regions. The structure of local and municipal governments needs to be streamlined for this purpose.. Also, bottom up initiatives should be encouraged and granted the right of hearing in planning processes. (Involving the public needs to be a comprehensive process throughout the planning and decision making process.) Furthermore, disadvantaged groups need to be identified and fairly involved in the respective processes.

Within the peri-urban areas adequate provision of services for the new population is a particular challenge. Another major challenge is the protection of farmers’ rights and living standards in the process of conversion of land to urban uses. Agriculture greatly contributes to a balanced development yet is a weak player in terms of financial power.

The compensation system for land lost farmers should be reformed. At the same time, creative strategies are required to assist farmers in the transition process from rural to urban life style. Finally, the embedded case of Xixi wetland park, a large wetland area that has been restored as a future green space of the expanding city, shows that protection and careful management of landscapes in the peri-urban areas will be of prime importance for their sustainable development.

In conclusion, the Hangzhou case showed that peri-urban regions are open for new developments, but only when guided by strong planning, the new developments can really add to local communities. The embedded cases revealed encouraging examples how this can be achieved. The paper will make suggestions for their further improvement and discuss their wider applicability in Chinese city regions.

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How island countries use coastal areas spatial planning to cope with climate change? - The case of Taiwan

Most of the observation demonstrated that many natural systems are being affected by regional climate change, particularly with increasing temperature. The effects on regional climate change are gradually occurring to natural and human environment.
In recent years, East Asia was attacked by typhoon, Weather and climate extremes, flooding and storm surge, landslides and other kinds of natural disasters. The situation poses a grave threat to social and economic in several countries in the region, especially in Southeast Asia and mainland China.
The impact in coastal areas caused by rising sea level can be divided into "natural shocks" and "socio-economic impact". In the part of the natural shocks, rising sea level might change Storm Surge and flood stages. The government needs to reconsider the design for flood prevention and flood control purposes. Climate changes also might alter the scale of typhoon and the rainfall, and increase river flow. Hence, the frequency of the flood control moisture is bound to do a comprehensive review.
It should be noted that accumulation and erosion are changed in coastal areas, such as sandbank area will gradually reduce, or estuarine sediment accumulation region mutate into coast erosion. In addition, there is significant subsidence in adjacent coastal plain, so the threat of inundation by the sea is raised. On the other hand, sea water intruded into surface water and groundwater, the salinization make land use change.
Creatures in the excessive salinity environment will also have a tremendous impact. Rising sea level exceeds a certain limit, the mangroves, marshes and wetlands will not be able to withstand the rapidly changing. Agricultural land use that makes a living with these environments will be affected.
In the socio-economic impact, the rising sea level will exert influences in the population, family households, land area and production. Therefore, space planning should be concerned about this phenomenon.
For the above phenomena, this article based on "thinking the land from the sea, and give an explanation in the space planning. In this article, we explain marine function zoning and scope of the proposed zoning, remediation and disaster areas, buffer zone and the zone of recommendations. This article review in land use on coastal areas - non-urban land, and analyzed in connection with aquaculture, coastal wind power generation equipment. Then we proposed to avoid development in coastal areas. If development is unavoidable, we advise a more stringent mitigation and compensation.

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From urban sprawl to eco-settlements: prospects for Arnavutkoy

The aim of this paper is to critically review the urbanisation processes which have resulted in the urban sprawl which dominates the Municipality of Arnavutkoy in Istanbul and to assess the possibilities for establishing a more environmentally acceptable form of low carbon development by drawing on the emerging experience of eco-settlements in the UK.

Thus the paper first analyses the recent urbanisation processes in Arnavutkoy, with particular reference to the adverse environmental impact of residential neighbourhoods resulting from low energy efficiency levels of buildings and poor standards of waste and water management. An assessment of the future impact of a 'business as usual' scenario for the continuing urbanisation of the district demonstrates the need for change.
A brief review of the emerging experience of eco-settlements in the UK and other EU countries, with particular reference to emerging experience of low carbon housing and 'carbon neutral neighbourhoods' identifies pointers for change in Turkish planning and development processes.

An assessment of the prospects of a shift towards low carbon neighbourhood development in Turkey/Istanbul, focuses on the increasingly dynamic policy environment, with particular reference to changing national energy, housing and planning policies, in the context of the EU harmonisation process and post-Copenhagen climate change obligations.

The paper concludes by developing a model proposal for a pilot low carbon neighbourhood development in Arnavutkoy, as a first step towards eco-settlements displacing urban sprawl.

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Play the Positive Role of the Urban Rural Interface during Urbanization of the Metropolis

In recent years, the process of urbanization in China accelerates constantly. The urbanization of metropolis in China is paid more attention and is worthwhile to research around the world, not only on the increase of city population scale but also on the expansion of urban space. Beijing is a super metropolis on scale, which has 14.39 million urban permanent residents and 2.56 million rural permanent residents, an urbanization rate of 84.9%, an urban area of 1311 square kilometer and extensive urban rural interface area. The author takes Beijing as an example, analyses the historical and realistic reasons that the urban rural interface area exist, points out many problems in the urban rural interface area including the gather of plenty of unemployment and tramps from rural, unstable society, disorder surroundings and low efficiency of the land resource use, puts forward the suggestions to improve the quality of urbanization by playing the positive role of the urban rural interface, such as setting up requisitioning and reserving land system, planning green isolated area around the city, adjusting industrial structure, making an overall planning of the economy layout, social management and public service throughout urban and rural, etc.. By doing so, we can make the urbanization of metropolis more efficient, make the society more harmonious, develop the urban economy more sustained and protect the environment more ecological. These suggestion and experience can be offered to the other metropolis in the developing country as reference.

PLUREL

Topic 12

Urban Forestry and Urban Greening in Developing Countries

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Urban agriculture and a sustainable systems science and design approach: Implications for climate change adaptation and urban-regional resilience

Urban agriculture (UA) can be defined as the integration of fibre, food, ornamental and/or medicinal production systems within an urban ecosystem. Then beyond the urban fringe or periphery such areas of production can be defined as peri-urban agriculture, whereas agricultural production beyond the peri-urban interface can then be defined as 'traditional' rural agriculture. Of course such definitions offer only broad distinctions as there is considerable overlap along the urban-rural continuum where geographical boundaries are blurred and multiple transformations are rapid and often irreversible. In this paper, these themes are discussed in greater detail along with broader discussions of climate change adaptation and urban-regional resilience and the multiple linkages of these concepts to UA.

The main benefits from UA can be broadly grouped at two scales, firstly the micro-scale interventions leading to increased 'food security' and 'income generation', and secondly the macro-scale impacts of 'enhanced urban environments'. The term 'micro' scale is used here to refer to individual agricultural plots and activities as these are often 'hidden household spaces individually small although collectively considerable' (Mougeot, 1994), whereas the 'macro' scale benefits offer multiple advantages at a wider urban ecosystem scale, such as improved urban sanitation; disaster risk reduction through better urban flood management and slope stabilization of steep hillsides; protection of fragile and vulnerable habitats including riverbanks and wetlands and; reductions in the urban heat island effect.

Sustainable systems science and design approaches are used to detail the micro and macro benefits of UA thus clearly linking urban ecosystem services to climate change adaptation and urban-regional resilience. Also presented is a full urban agriculture classification system appropriate for the development and implementation of urban and peri-urban environmental policy both in temperate and tropical environments. A range of examples from urban case studies already experiencing high climatic variability are used to illustrate future scenarios and the importance now of appropriate urban and peri-urban environmental policy to foster climate change adaptation and build urban-regional resilience. Also illustrated are geo-political urban and peri-urban 'hot-spots' which provide further illustrations and interesting potential scenarios of how climate change-induced events may impact in the peri-urban interface resulting in future scenarios of rapid population displacements and regional food insecurity.

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China's Urban Forest Benefit Assessment Model and Case Application

Comprehensive assessment of forest benefits of urban areas is of great value for strengthening urban forest resource management, increasing urban forest technical level and improving urban forestry decision making. China's urban forest assessment model builds on the integration of UFORE, Citygreen and McPherson model, and additional assessment indicators for creating negative ion concentration, producing oxygen, timber and non-timber product, recreation and temperature adjusting were added, assessment parameters that are more applicable for China's urban forest structure and functions were selected and standardized urban forest data collection methods and national and international lastest assessment methods were used to provide an improved assessment system and technical scheme for comprehensive assessment of the benefits of urban forest. This model was used to assess the main forest structures and the benefits of forest fuctions in Hangzhou, China based on the data for air pollution, land use, metreorological and social-economic status of Hangzhou collected in a standardized manner.

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Agents of Change - Development of urban parks in the Israeli Negev

The Israeli Negev in the south of Israel is a dry desert Region that is minimally populated. However the geographical size of the Negev represents 60% of the land of Israel.

The capital of this region is Beer-Sheba (190000 inhabitants). The largest Bedouin population is found in this area. In the past the Beduim lifestyle was based on nomadic travel in the desert, however today the majority live in small new cities. The Negev's socioeconomic level is much lower than that in the central part of Israel , and many of the cities suffer from budget deficit .The lack of transportation infrastructure and the geographical distance from the center make the development of open area forests and urban parks even more vital in this area.
This region is characterized by numerous wadi (dry river beds) which flood only in winter. Some of these wadi are located in industrial and commercial zones. In biblical times the river was a source of life and a place of gathering for the community. In modern times the river area has become the "back door" of the city.

In the last decade the Jewish national Fund, the municipal governments, and the Israeli River Authority have spearheaded a new program. They have begun to envision and implement projects including the development of urban parks and urban forestry, which have effected many changes.

The creation of municipal parks in the wadi area of Beer Sheva has brought about a visual and image change. In the way the area is perceived by both decision makers and the local population. A change that has brought about an increase in the land value of the neighborhoods, and created new employment opportunities. This urban park is now a recreational area utilized by privet and municipal groups.

In order to achieve the above, a special management team was set up and a master plan of metropolitan development was introduced. This plan included river restoration, intensive and extensive open spaces lake, construction of a new commerce area, open amphitheatre, walking paths etc...

The success of this project In beer sheva has attracted the attention of other Negev cities including the Rahat largest Bedouin city (50000 inhabitants) which have requested similar projects.

This paper deals with the process involved in creating urban parks by municipal bodies in order to effect cultural and economic changes in financially challenged areas.

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Planning of urban green space Sustainable use: kaihua County case study

Zhejiang is east coastal province in China's which highlight on the development of urban forestry and sustainable use of urban land with the economic development quickly. Kaihua County of Zhejiang province emphasizing the scientific planning of urban green space in carrying out forests urban construction activities, it make a strong support to social harmony & sustainable development by take forest eco-systems using some methods such as setting a reasonable size, reasonable layout, scientific management and protection, set up projects and policies, systems, financial and other support. This paper focused on Kaihua's land-use planning concept of "one axis, two pulses, three bands, three districts, six groups " . The one axis is Ma Jin stream as the tributary of Qiantang River source. The main pulses are long human history and advanced cultural ideas. To develop a landscape garden town. Which express "the source culture, tea culture, root carving culture" base on" Western Ecological Protection district, central ecological coordination district the eastern-based eco-conservation district" and highlights the six clusters of forest landscape such as Huashan Park ,Root Park et al.

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Evaluating urban greening efforts in China-are current evaluation systems adequate?

Urban greening can help to improve environments of cities. In order to evaluate the effectiveness of urban greening efforts and guide the planning process, an evaluation system needs to be created. In this study we compared four different evaluation systems at the national level currently used in China. The criteria for designating national garden city, national green model city, national forest city, and national ecological garden city were analyzed for their objectiveness and feasibility. A binary logistic regression model was constructed by treating cities that belong to those four types as dependent variables and eight social and ecological factors as independent variables. We further analyzed all cities at prefectural level in China by using a systematic clustering method based on the eight factors. The result of our research indicates that the 287 cities in China can be clustered into 10 categories. The national garden cities and national greening model cities concentrated in three categories, respectively. The national ecological garden cities concentrated in 2 categories only. The national forest cities spread most widely, in seven categories. The regression analysis shows that besides the percentage of greenspaces, built-up area, per capital GDP, population density, and types of ecological zone can also affect the designation of those four types of cities in various degrees. All four systems are biased to favor cities in economically developed regions or with favorable natural environmental conditions. In the end, we propose to create a simple, valid, and comparable evaluation system based on available data.

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The Pattern Selection of Forestry Land Multifunctional Use of Peri-urban Areas under the Background of Urbanization in Beijing

The land use conflicts are very prominent in Beijing peri-urban areas as a super large city being in the rapid urbanization process. It's facing sustainable land use challenge because there have a lot of demands such as ecological and environmental protection, urban residents recreation, real estate development and commercial forest development. Peri-urban forest land multifunctional use not only is a hot issue in the process of urbanization in Beijing but also become a difficult problem development of urban forestry development. This paper will select cases for the eco-shelter forest, leisure forest park, non-timber Forest and other multifunctional use forest and make a comprehensive analysis of different forest land use patterns on leisure, ecological, industrial functions. It will put forward option ways and some policy suggest on Beijing peri-urban sustainable & multifunctional use of forest land in the process of urbanization.

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Topic 13

Remote Sensing and GIS for Sustainable Urban Development Science

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To consider agronomical potential a strategic heritage: spatial indicators on urban sprawl and consumption of agricultural lands. The Languedoc case study

Population growth in the Languedoc coastal region is very high since few decades. This phenomenon produces a rapid and uncontrolled urban sprawl at agricultural lands expense. While these lands are often high agronomical potential, they are most often permanently lost. Agricultural areas are usually considered as land stocks for urban consumption whereas natural areas have more legal and spatial planning tools to protect them. This loss of land is considered as minor at a local level: elsewhere preserved farmlands exist "forever". Decades after decades, and considering the agricultural products crisis that could impact supply, this loss becomes a strategic issue at the level of an entire country.

To better understand the dynamics of consumption of these agricultural lands by artificial surfaces and to have spatial tools to argue the risk of permanent loss of agronomical potential heritage, the Regional Direction of Food, Agriculture and Forestry of Languedoc-Roussillon has commissioned a study from research institutions: INRA for the agronomical theme and Cemagref and Cirad for the spatial information and analysis.

The methodology has been developed to establish two main state indicators, which need to be mapped: the artificialized areas and the index of soil quality. The production of these two indicators is not easy, according to information sources, compatibility between spatial sufficiency offered by very high resolution remote sensing images and the sampling measurements and mapping models of soil. The spatial interpretation of the indicators is not easy whereas actors see them as relevant for both aspects of the issue: a heritage and the pressure on that heritage.

Additional indicators can be produced by spatial analysis metrics to clarify the terms of the constraints of urban sprawl on farmland. These spatial indicators are designed in a process of consultation with public stakeholders involved in the territory to validate the relevance of the approach: the information is based on spatial data, temporal changes and other weights variables as demography. The methodology can be used in the future for all regions in France.

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Analysing urbanisation: the role of remote sensing in multi-dimensional measurement concepts

The impact of urbanisation on natural habitats and ecosystem functions is the subject of research and planning agendas in a variety of fields. Apart from environmental outcomes, social and economic aspects are increasingly becoming a critical part for viable development strategies, particularly with regards to the preservation of cultural landscapes and the many conflicts around the scarce resource "land". In terms of data, population figures and the size of specific urban areas and their surrounds have long been the main components for analysis. More recently, however, these basic pieces of information have been discussed in wider multi-criteria concepts that aim at assessing land use change more comprehensively. Several dimensions of urban dynamics are fundamental to these concepts, namely the "surface" features that are physically present, the "patterns" in which they interact with each other, and the "density" of entities within the urban compound. Together with measures on the magnitude of interaction within and between urban areas ("flow dimension"), a four-dimensional impact model is now being discussed as a theoretical conceptualization of urbanisation. On the one hand, it is capable of differentiating between increasingly heterogeneous development paths (different types of urban sprawl, shrinkage and urban decline, fragmentation), on the other it is very demanding in terms of data and methodology. Not only does this require information on the form and setup of detailed urban land use patches over time, and their location in space. The multiple dimensions are also to be captured in the form of suitable indicators that meet a range of methodological requirements (robustness, scalability, etc.).

Apart from the thematic richness to meet the data needs of this concept, the interaction between urban areas and the ongoing blurring of the urban-rural continuum means that case studies are no longer suitable to capture urbanisation processes in their entirety. On top of comparative research between representative cities, monitoring on an area-wide basis is required, and data infrastructures are being designed to deliver the needed information. These databases aim at providing state-of-the art geodata intelligence on a standardized basis, capitalizing on the possibilities of new data warehousing and analysis techniques. However, the development of robust databases is highly time- and cost-intensive, and at this point in time, the capacity of local authorities to provide information for sophisticated analysis techniques differs considerably. Furthermore, the temporal component of urbanisation means that any analysis that aims at capturing aspects of the past will have to integrate historic datasets.

In this context, the role of urban remote sensing will be discussed in this paper, both in terms of its potentials, but also in terms of its limitations. Based on a detailed description of a multi-dimensional impact model of urban development, data requirements will be formulated as a predicament for a subsequential analysis of the German geodata situation. It will be shown where remote sensing can deliver robust and reliable information where other datasets do not exist or are not practical to obtain. At the same time, cost-effectiveness as well as aspects of data harmonization across area units need to be taken into account when looking at the implementation of monitoring concepts, as well as the necessity to integrate remote sensing data with geocoded socio-economic data. In this context, a spatial reference grid will be introduced that serves as assessment platform for indicators. Using practical examples, a number of indicators derived from remote sensing data will be shown that deliver good results in this context. At the same time, a concluding chapter in this article will elaborate on the reason why remote sensing data is not

being used more extensively in the field, discussing issues of data availability, quality, and integration in existing monitoring frameworks.

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GMES Services - Urban Atlas

GMES – Global Monitoring for Environment and Security – is aiming at building a European capacity for Earth Observation (EO). Since the launch of the initial concept of GMES back in 1998, substantial investments for Research and Development have been made by the European Union, the European Space Agency and their respective Member States. GMES encompasses global, continental and local services. The local component is represented by the Urban Atlas.

Urban Atlas
The Urban Atlas provides high resolution pan-European comparable land use data on the exact same boundaries as the Large Urban Zones defined by the Urban Audit. The Urban Audit is a collection of statistical data collected by Eurostat in the EU-27 member countries. In total some 305 European cities with more than 100.000 inhabitants will be mapped using very high resolution satellite data (2.5m). The cities are mapped at a nominal scale of approximately 1:10.000, using 20 classes with a minimum mapping unit of 0.25 ha. The concept of the Urban Atlas is based on the MOLAND / MURBANDY work carried out by the JRC, but without the land cover change component so far. Currently the baseline for the reference year 2006 is being established. Updates of the database are foreseen for every three to five years.

Applications
The Urban Atlas is still in production; therefore the number of applications is still restricted. First applications include an assessment of the impact of mapping scales on urban surfaces (Corine Land Cover vs. Urban Atlas) and a contribution to the assessment of the quality of life in urban areas by comparing the share of green surfaces within the city and its surrounding areas (Urban Atlas vs. Green Background Map). In future, the analysis of Urban Atlas data will benefit significantly from having access to socio-economic data for the same areas and vice versa the Urban Audit will benefit from having access to reliable and comparable urban land use data and a spatial representation of its information.

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Monitoring and modelling of urban land-cover/land-use by means of remote sensing and GIS - an overview

During recent decades land-cover and land-use information have become essential to the operational application of landscape related sustainability goals and land management in urban agglomerations. Such information is currently in use i.e. for the monitoring, evaluation and mobilization of land potential/development land reserves as basis for the planning of subsequent uses, law impact/balance regulations under nature protection law as well as for nature protection concepts as quantitative (and qualitative) characteristics while applying a periodic land-use monitoring. Furthermore, land-cover/land-use data are of crucial importance as a basis for communication and information concepts for the public and for political decision makers, applied on the levels of municipalities, counties, regions, and, on the national level in different arrangements. Apart from the use of already existing official geo-data information systems (in Germany e.g. the official land information systems ALK, ATKIS, local brown field cadastre, land-use maps, etc.) and the evaluation of historical and current aerial photographs new methods using airborne and satellite-based remote sensing instruments and relevant analysis techniques for land-use analysis for different users move increasingly into the focus. Nowadays land compensation management and conversion management have become accepted as important new, planning instrument for a sustainable urban development. In particular, for the progress control, the potential for examination by remote sensing data by 'change detection/change analyses' products combined with GIS methods to the land recycling is acknowledged to contribute by a regular land cover/use inventory. The survey of brown fields and building gaps by airborne and satellite borne sensors as well as the GIS-based evaluation of their environments and/or reuse potentials are thus a substantial basis for the compensation land management and land recycling. Planning associations in metropolitan regions, which analyze inter-communal urban – peri-urban relations and are focussing on interdependences of land use systems in the urban region context (integrative approach - surface - demographic change - economic development) are necessarily dependent on current and replication able land cover/land use data, acquired from geo information data. In this concern the most important indicators recommended by the German Federal Office for Environment Protection sustainable land management ('30ha-goal' of the Federal Government, e.g. to not newly occupy natural soils with artificial surfaces more than 30 ha a day) are used in the presented project for a monitoring approach: settlement and traffic surface [ha/day], soil sealing and unsealing potential [%], brown field/land recycling index in relation to brown filed potential [km ² /km ²], aerial extent of protected areas and agriculture surfaces and the degree of the landscape cutting .

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Simulation of future urban growth scenarios for the Madrid Region (Spain) using GIS and multicriteria evaluation techniques

Urban expansion during the last few years has occurred without much control or urban planning, causing both regional and global impacts on the natural ecosystems. This situation has spurred reflection on current planning policies and has also stimulated research on new tools and methodologies for the simulation of alternative territorial scenarios for the future.
In this respect, the use of MultiCriteria Evaluation (MCE) techniques within a Geographical Information System (GIS) environment has been proved to be an efficient option for an optimal assignation of land uses. However, those techniques have not been thoroughly explored yet in the field of scenario simulation. For this reason, the objective of the research presented here has been the generation of three scenarios of urban growth (business-as-usual, crisis, and innovation-sustainability) using MCE techniques. All those three scenarios discriminate between three land uses (residential, commercial and industrial), and they have been developed for the Madrid Region. These scenarios simulate the land use structure for 2020 building on the actual situation in 2000. In that process, fourteen spatial factors have been considered, which include environmental, economic and social aspects. Some of those factors have been designed with the focus on maintaining an adequate balance between the urban and rural realms. For instance, the factor that takes into account the distribution of land uses in 2000 tends to preserve areas with either high agricultural productivity or high environmental value. The accessibility factor, in addition, follows the principles contained in the European Spatial Development Perspective (ESDP), and therefore it favours urban growth in medium size municipalities, limits the expansion of the biggest cities, and preserves the rural villages that are still present in the region.
The results obtained show that some discrepancies exist between the business-as-usual scenario (E1) and the European policies for transport and for the environment. This situation has an impact on the territory, and it causes irreversible damages to the environment. The crisis scenario (E2), in contrast, alleviates those pressures, if not because of the application of environmental policies to the planning process, at least because the situation of crisis causes the metropolitan model to change. Finally, innovation has been considered a driver for economic development and good planning practice, the positive effects of which have been highlighted in the third scenario (E3). This scenario directs the model towards higher economic and social development and lower damage to the environment. This happens, mainly, due to the incorporation of sustainability criteria into the planning process, to a less intensive land demand from productive activities, and to some 'recycling' of urban land being taking place.

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From satellite imagery to spatial planning practice in urban areas.

The long-time promise of remote sensing to substantially support urban and spatial planning has only rudimentarily expanded into practice. Thus, we present in this study an overview on the manifold capabilities, but also limitations of remote sensing with respect to data capabilities, costs, processing time and efforts, products, accuracies, etc..
Therefore we show examples of multi-sensoral, multi-temporal and multi-scale results: We conduct multi-temporal analysis using time-series of Landsat and TerraSAR-X data for largescale spatiotemporal monitoring of urbanization on urban footprint level. We use landscape metrics to quantify spatial change and its pattern over time as well as across cities. On a higher geometric level we use multisensoral data from high resolution optical satellite (Ikonos,RapidEye, etc.) and airborne sensors (LiDAR, HRSC, etc.) to derive a 3-D city model.
Furthermore we calculate urban morphology parameters on individual building or block level like e. g. building size, height, roof materials, built-up density, floor-space index, sealed areas or urban structure types.
Based on the physical parameters of urban morphology we provide insight into interdisciplinary capabilities. We correlate data from social science – population data and located socio-economic parameters of the population – with the urban morphology. We answer energy related questions presenting the examples of local heating capacity with respect to urban structure types or the identification of roofs featuring solar heating facilities. We show an example of risk and vulnerability assessment in flood exposed urban areas to derive planning recommendations. In addition we show regional and local analysis of climate effects in urban-rural areas. With the manifold capabilities of thematic applications in urban areas, we critically discuss future steps to integrate products of remote sensing into planning practice and the need for inter- and transdisciplinary approaches.

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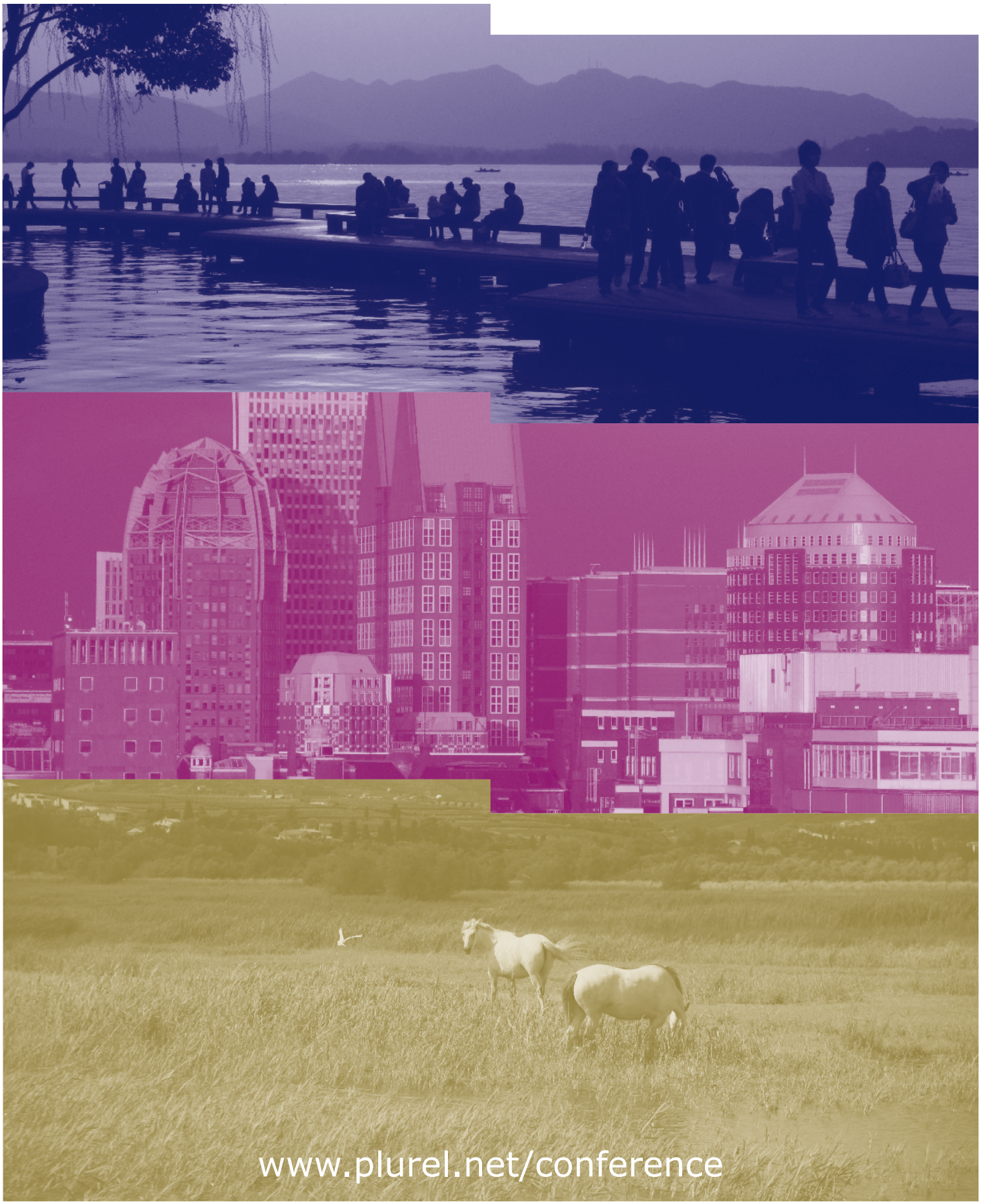

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