

# PLUREL

Scientific management  
and co-ordination

Module 6

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**PERI-URBAN LAND USE RELATIONSHIPS –  
STRATEGIES AND SUSTAINABILITY ASSESSMENT  
TOOLS FOR URBAN-RURAL LINKAGES,  
INTEGRATED PROJECT,  
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## PLUREL Newsletters

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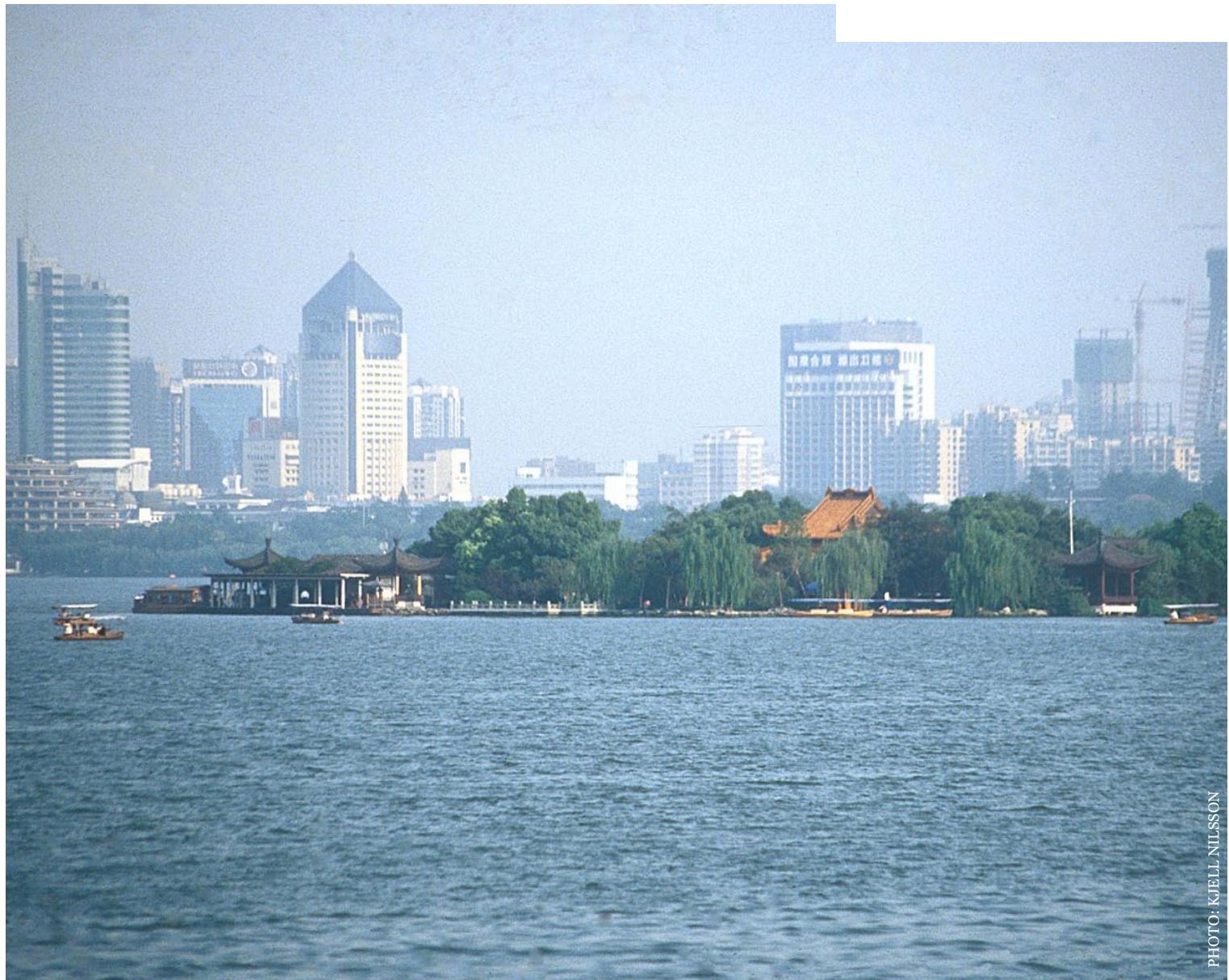


PHOTO: KJELL NILSSON

# Science for Sustainable Rural-urban Regions

**In the light of ongoing urbanisation, policy-makers and planners are shifting their focus to rural-urban regions, linked through flows of people, information, goods and services. Science has the task to support the sustainable development of these complex, multifunctional regions.**

## **Challenges of urbanisation**

Urbanisation is arguably the most significant process of land use change in Europe. According to the European Environment Agency, more than 70% of Europe's population is now living in urban areas. In size, these urban areas have grown by almost 80% over the last fifty years.

Urbanisation is most visible through the spread of built-up areas, business parks and the creation of large transport networks and hubs. New leisure parks, golf courses but also the conversion of farmsteads into residences and hobby farms in near-urban landscapes are other manifestations of urbanisation.



PHOTO: JOE RAVETZ

Changes in the relationship between rural and urban land uses has major consequences both for people's quality of life and for the environment. Inefficient land use patterns result in economic, social and environmental costs. Examples of these costs are the need to maintain transport and social infrastructures over larger areas, distorted land prices, and increased energy consumption and emission of greenhouse gases as a result of commuting. Urbanisation can also have a negative impact on environmental services such as the provision of drinking water. It can erode the character, identity and attractiveness of cultural landscapes.

In the light of the above, it is understandable that the European Spatial Development Perspective, issued by the European Commission in 1999, considers rural-urban processes of major importance to achieving sustainable development in Europe. Moreover, the year 2000's European Landscape Convention states that it is essential to strike a balance between preserving the natural and cultural heritage, and using the landscape as an economic resource.

#### **Focus on Rural-Urban Regions**

The development of urban regions represents the main manifestation of urbanisation processes. New patterns of built / non-built and multi-functional land use types have emerged, covering larger areas at regional and inter-regional scale, and including urban areas as well as rural surroundings. So-called rural-urban regions (RURs) have emerged that are intricately

linked by flows of people, money and information, the exchange of materials and goods, as well as environmental services.

Europe's future will depend on whether pathways to sustainability can be created within these rural-urban regions, as they are so important in terms of human welfare and their enormous impacts on the environment. Rural-urban regions are appropriate units for dealing with many sustainability issues. For example, surrounding rural areas play a crucial role in the management of water runoff from cities and they provide much-needed recreational opportunities for urban inhabitants. The evolving land use structure within rural-urban regions has long lasting impacts on their social, economic and environmental performance. The dispersion of built up areas, for example, is linked to the growing demand for transport, and hence energy consumption. However, attempting to influence land use systems through planning is a difficult task.

When developing strategies for sustainable rural-urban land use relationships, a particular challenge lies in the multifunctionality of peri-urban land use. Policy and management, however, often focus on one function at the time, in an attempt to resolve conflicting demands and pressures. This will lead to sub-optimal decisions, conflict and marginalization. Methods need to be developed for working with complexity and uncertainty, at multiple scales with a wide range of stakeholders.

#### **How science can help**

The development of urban regions has evoked the interest of scholars and planners for over a century, beginning with Ebenezer Howard's original response to the rapid growth of London, i.e. that of the »Social City«. Emergence and study of large rural-urban regions is a more recent phenomenon.

A key role of science is to provide credible, relevant and accessible knowledge for decision making. There is a need to improve understanding of the processes that drive present and future land use changes. Central questions to be answered include: What are the major socio-demographic trends in Europe's rural-urban regions, related to for example, ageing and shrinking populations, but also migration? How will these trends affect the relationships between urban, peri-urban and rural areas and how do changing relationships translate into land use change? Technological change may also have profound consequences for rural-urban relationships, for instance through new transport technologies. Moreover, climate change is now widely accepted as a reality. How will this affect land use and environmental services in rural-urban regions across Europe and what is the capacity of various land uses to adapt to climate change?

Land use changes are driven by global economic, social and environmental processes. The response to changes, however, will greatly vary between regions due to their specific character, as well as politi-

cal and planning cultures. Therefore, for developing strategies that are tailored to local potentials and constraints, it is essential to understand the relationships between rural-urban processes and regional approaches to policy making. Such strategies will have to deal with the complexity of multifunctional land use systems. The involvement of many actors needs to be considered. They operate at several levels of planning and decision-making, ranging from individual households and land owners to regional, national and European policy makers.

How can governance deal with these challenges associated with rural-urban land use systems? Today, these systems are not at all fully understood. For future planning strategies that strengthen the adaptive capacity of rural-urban regions, for example to unforeseen changes, gaining a better understanding of the complex behaviour of rural-urban land use relationships will be crucial.

#### **Involving stakeholders**

It will be a challenge to keep the many stakeholders well-informed and involved in the development of rural-urban strategies. In this respect there is a clear need to make science more relevant in natural resources and land use planning. For example, the flow of information across the science-policy interface to support policy-making needs to be improved. Today, this science-policy interface is often weak and calls for more targeted and tailored »translations« of research, to be used directly by decision-makers.

Experience shows that a step-wise process, from informing the public in an attractive way towards fully participatory approaches, is most likely to ensure sound, socially-inclusive planning. This process should be tailored to the specific planning context. Moreover, communication with policy-makers requires a high degree of openness and every phase of the process needs to be explained in detail. Actor-based, participatory scenario approaches seem suited to meet these challenges. The same can be said for web-based tools that, for instance, allow stakeholders to access information related to rural-urban issues and assess the sustainability impacts of policy options. At the time there is a lack of such tools tailored to rural-urban planning and management.

#### **Conclusion**

Changing land use relationships within emerging rural-urban regions, and their manifestation in phenomena such as urban sprawl and development of large scale transport corridors have long lasting consequences for the region's sustainability. The drivers of land use changes and how they interact with regional, national and European policies need to be better understood to minimise negative consequences of urbanisation and to enhance the adaptive capacity of rural-urban regions. Rural-urban regions can become centres of sustainable development, but this requires strategies that are developed by means of participatory planning and decision making. This is the

focus of the project »Peri-urban land use relationships – strategies and sustainability assessment tools for urban-rural linkages« (PLUREL), an integrated project under the European Commission's Sixth Framework programme.

PLUREL will provide tools for exploring strategic scenarios for rural-urban development, as well as for assessing the sustainability impacts of these processes. These will help policy-makers and other stakeholders in dealing with the challenges of land use planning in an urbanising society.

*Stephan Pauleit, University of Copenhagen*



# PLUREL in Brief



**PLUREL is a so-called integrated project under the European Commission's Sixth Framework Programme for research. Sustainable rural-urban land use relationships require proper policies and planning. PLUREL aims to contribute to this by developing strategies as well as planning and forecasting tools. These will help analyse urbanisation trends in the European Union, while they will also contribute to better guidance of urbanisation processes and to minimise their negative impacts.**

## Rural-Urban Regions

PLUREL's main study subject is the so-called Rural-Urban Region (RUR). The idea of a RUR is an extended form of a Functional Urban Region, i.e. the concept used to describe an urban core and its surrounding commuting ring. The RUR

extends beyond today's rings of intense interaction with the core city, as it also includes lands for recreational use, food supply and nature reserve functions in predominantly rural areas.

## A truly international project

Thirty-one universities, research institutes and private enterprises from fifteen countries participate in PLUREL. Partners do not only come from Europe, but also from China, a country where rural-urban regions are rapidly developing. Inclusion of greater Hangzhou amongst the project's seven case study regions therefore provides an interesting perspective for the European situation. Rural-urban-regions in France, Germany, Poland, The Netherlands, Slovenia and the United Kingdom are also studied. The regions studied represent a wide variety in terms of political, economic, land-use and other

characteristics. They all have in common, however, that links between their urban and rural areas are under rapid development. Stakeholders in all cases, such as local planners and interest groups, are actively involved in project work. Detailed local analyses are combined with studies at the European level. In this way conclusions can be drawn for Europe as a whole, based on a typology of rural-urban-regions.

## From driving force to response

PLUREL's activities are organised into six interrelated modules. The organisation of each module has been inspired by the so-called DPSIR-framework. DPSIR refers to a chain of events where general driving forces result in pressures, which again affect the state of the environment. Changes in the state of the environment will have an impact on ecosystems, human beings



PHOTO: CECIL KONIJNENDIJK

## PLUREL Factsheet

Project title:	Peri-urban land use relationships – Strategies and sustainability assessment tools for urban-rural linkages (PLUREL)
Main funding programme:	European Union's Sixth Framework programme for research, priority 6.3, »Globale change and ecosystems«
Project type:	Integrated project
Duration:	January 2007 – December 2010
Size:	1153 person months, 10.5 million euro
Partnership:	31 partners from 15 countries
Coordinator:	Danish Centre for Forest, Landscape and Planning, University of Copenhagen
Website:	<a href="http://www.plurel.net">www.plurel.net</a>



PHOTO: CECIL KONIJNENDIJK

etc. that may warrant a response aiming to change or modify the outcome.

### Six modules

PLUREL's Module 1 looks at the main underlying driving forces of the urbanisation process, and relationships between urban and rural areas, such as global economy and technological development, demographics and climate change. In module 2, these general trends are »translated« into demands on land use, resources and public participation, all in the interface between rural, peri-urban and urban areas. This work includes study of different strategies for urban growth (or shrinkage). The challenges posed by the development of drivers and demands in seven case study regions are studied in module 3, where local stakeholders are involved in analysis of the regional context as well as development of scenarios and strate-

gies. In module 4 effects of land use scenarios resulting from decisions made by stakeholders at the local/regional level are modelled. This involves the development of a conceptual impact assessment approach for the three sustainability dimensions: environmental, economic, and social. Module 5, then, brings together all project results.

A »toolkit« will be produced to support integrative analysis, assessment and planning of sustainable rural-urban land use relationships in Europe. This toolkit will include ways to forecast the effects of global drivers and trends on urban – peri-urban – rural land use relationships, as well as contributions to the development of site-appropriate strategies, including participatory processes. A central element of the toolkit will be a Sustainability Impact Assessment Tool for Rural-Urban

Regions. This SIATRUR can be used for sustainability assessment of European and regional policy options related to rural-urban relationships. Module 6, finally, is concerned with project management and dissemination activities.

### Expected results

Rural-urban regions are a rather new phenomenon in policy making and PLUREL is expected to produce important new knowledge on the effects of policies and development in these RURs. The project will provide policy-makers and other stakeholders with a set of state-of-art tools for evaluating policies for these regions. In this way, sustainable development of the rural-urban field will be supported.

*Thomas Sick Nielsen,  
University of Copenhagen*

# PLUREL Case Study Areas

## Montpellier, France

The urban region of Montpellier has developed rapidly since the 1960s, doubling its population. This represents the highest demographic growth in France. Close to half a million people now live within 1520 km<sup>2</sup>. The region's land uses range from dense urban centres to the biodiverse wetlands along the Mediterranean coast. Urban pressures have led to a loss of agricultural land and pose continuous threats to the natural environment. Risks of floods and fires are a major concern to urban planning.

## Leipzig, Germany

Greater Leipzig, with its 0.5 million inhabitants, has a long history as main urban centre in Central Europe. The German Democratic Republic's social planning system largely prevented urban sprawl after the Second World War, apart from some large-scale housing estates on the urban fringe. At the end of the 1980s, political changes initially led to heavy urban sprawl. This process stopped and even turned into shrinkage when economic and demographic realities, such as unemployment and a decreasing population emerged.

## Warsaw, Poland

The Polish capital and its surrounding region are undergoing rapid change. The capital region is attracting considerable economic activity and immigration. Suburbanisation processes are mostly of a rather unplanned character. A lack of good governance results in land use conflicts and related problems, such as encroachment of residential and commercial development upon agricultural and forest land. Development of an integrated plan for the metropolitan area is still in its initial phase.

## Koper region, Slovenia

The Koper region comprises the entire coastal harbour and industrial region of Slovenia. This coastal zone is rapidly developing and urbanising with a mix of harbour industry and tourism activities, leading to land use conflicts. The neighbouring Dragonja Valley is depopulating and agricultural areas are being abandoned. Water scarcity is a major issue in

the region as the competition for limited resources intensifies.

## City Region of Haaglanden, The Netherlands

This regional authority in the country's coastal zone comprises nine city councils, including those of The Hague and Delft. Collaboration within the city region provides opportunities for coordinated policy and spatial planning. This is important, as the region is densely populated and has to balance, for example, urban and agricultural land use. Water management is another major task. The region emphasises development of its green image and qualities.

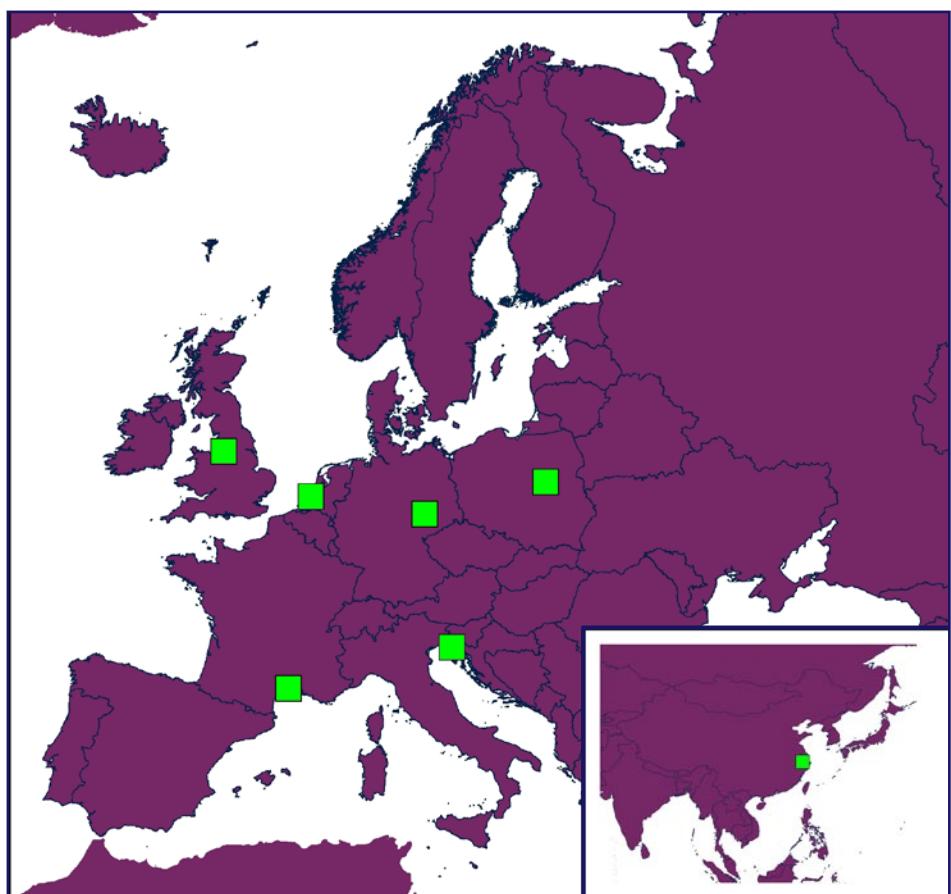
## Greater Manchester, United Kingdom

Greater Manchester is at the centre of a city-region agglomeration of 4.5 million people. It was one of the first industrial and global trading cities, and has seen rapid industrial restructuring and dereliction in and around the urban area.

The peri-urban landscape of airports, motorways and waste treatment infrastructure, also contains innovations in multi-functional land use. These include planning policies, third sector development trusts, community forests and green cycle trails.

## Hangzhou, China

Hangzhou is a major Chinese city, famous for its cultural heritage of gardens, temples and lakes. Situated in the Yangtze River Delta, south of Shanghai, the city lies at the centre of a strongly prospering region which is urbanising at an extreme pace. Already now, Hangzhou has over 6 million inhabitants, and has an estimated annual growth of about 100,000 people. This growth results in major pressures on cultural landscapes and the environment. Hangzhou is thus highly appropriate for studying governance of rural-urban land use relationships in the Chinese context of extreme urbanisation.



# PLUREL People

Interview with Kjell Nilsson, University of Copenhagen



PHOTO: THOMAS SICK NIELSEN

## What is your role in PLUREL?

Our consortium consists of the leading European experts on different aspects of urban development. My primary role as project coordinator is to help everybody find their role in the project and be motivated to work for joint success. My second role is to maintain a close contact with our main funder, the European Commission and to make PLUREL well-known amongst different policy-makers in Europe.

## How will PLUREL benefit from your own expertise?

Most important is my expertise within research management. I have coordinated several interdisciplinary projects and networks dealing with multifunctional land use, urban landscapes and the relationships between people and their environment, both at national and international level.

## What will be PLUREL's most important results?

PLUREL is the only Integrated Project under the 6th Framework Programme dealing exclusively with urban development. It therefore has an important role to play in assisting policy-makers with analysing urbanisation processes and trends in the European Union, in order to support sustainable urban development. In this sense PLUREL is supplementary

to sustainable land use projects funded by EU such as SENSOR (rural areas), SEAMLESS (agriculture) and EFORWOOD (forestry).

## Which challenges can stand in the way of PLUREL's success?

Technically, the most challenging aspect is the integration of different scientific models that use huge amounts of both quantitative and qualitative data into a robust and user-friendly Sustainability Impact Assessment Tool for Rural-Urban Regions (SIAT-RUR). The main operational challenge is to ensure active involvement of stakeholders in the six European case study regions and the Chinese reference study. Our ambitious dissemination plan should help us with this.

## Why should policy makers be interested in PLUREL?

Europe is the most urbanised continent in the world. Urban areas are the vehicles of economic development and a key factor for people's health and welfare. However, negative consequences such as urban sprawl, social problems and environmental hazards threaten sustainable development. There is a need to mitigate these negative effects and improve the quality of life of city dwellers, as well as those who live in peri-urban and rural areas. PLUREL will help by developing innovative planning strategies and forecasting tools.

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# PLUREL



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- Université catholique de Louvain, Belgium
- Institute for Local Government Studies, Denmark
- The Finnish Environment Institute, Finland
- University of Paris I & COE/CCIP, France
- Agricultural and environmental engineering research centre, CEMAGREF, France
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- Christian-Albrechts-University of Kiel, Germany
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- Metropolitan Research Institute, Hungary
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- University of Groningen, The Netherlands
- Queen's University Belfast, United Kingdom
- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France

## **Peri-urban Land Use Relationships**

*Strategies and Substanability Assesment Tools  
for Urban-rural Linkages*

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## Governance and planning under scrutiny, for comparison and shared learning

**Under the theme »Global Change and Ecosystems« of its Sixth Framework Programme, the European Commission calls for the development of strategies and tools for sustainable urban and peri-urban relations. PLUREL aims to meet this call by developing new strategies and**

**innovative planning and forecasting tools. Innovation requires close cooperation between practice and research. With this in mind, PLUREL includes a research module of case studies in which seven urban regions and thirteen research institutes, universities and enterprises cooperate.**

### **Six European regions and a Chinese reference**

The urban regions of Warsaw (Poland), Montpellier (France, shown on photo), Greater Manchester (United Kingdom), Leipzig (Germany), Koper (Slovenia), Hangzhou (China) and Haaglanden (the Netherlands) represent an amalgam



PHOTO: THOMAS SICK NIELSEN

of spatial development and planning contexts. As can be read elsewhere in this newsletter, Warsaw is a monocentric boomtown in the eastern part of Central Europe, with considerable economic activity, immigration and spontaneous suburbanisation. Montpellier, which is also fast growing, brings in a coastal context and water management concerns (e.g., related to flash floods), just as Haaglanden and Koper do. Haaglanden and Greater Manchester are polycentric regions. Manchester experiences rapid out-migration and is restructuring its peri-urban land use and economy. Out-migration from the urban centre of the Leipzig region has resulted in a surplus of housing and offices, offering room for new housing and development concepts. The Slovenian Koper region consists of an important harbour area with industrial and tourist development. Like Warsaw, the region represents a transition economy. For special reference Hangzhou, a major city and cultural and industrial centre in eastern China, is

a partner in the research. The different planning and administrative culture as well as the size of this region with its seven million inhabitants provide PLUREL with an additional dimension.

The number of case studies involved in PLUREL is limited. The project team rather focuses on in-depth research and close involvement of the regions. Regional stakeholders such as authorities, businesses and civic society are an essential source of knowledge and information for PLUREL. This is also the case for these stakeholders' policies and endeavours to influence developments in the urban fringe. Stakeholders' real-life experience and knowledge of place complements the more generic desk studies of planning, administration, and regional development types carried out by the other research modules. Governance and spatial planning strategies in the seven regions will be compared in order to learn from different experiences. Moreover, they

will provide insight in general patterns and make it possible to identify context specific impacts and developments of, for example, green space in peri-urban areas.

### Towards a common impact assessment tool

The European Commission has asked for an instrument to forecast the effects of global trends and policy decisions on peri-urban areas, a so-called Sustainability Impact Assessment Tool (SIAT). This requires the modelling of trends, land use relations and management, and of the effects of policy decisions in different types of regions. This work calls for the integration of stakeholders' knowledge, perceptions and strategies. Putting the scientific knowledge and models to the test is an important objective. A major challenge is to develop – jointly with practitioners – a common language and common concepts, in order to contribute to a wider use of PLUREL knowledge. Could the forecasting tool be used by the European Commission as well as the regions? Can it form a basis for communication and support discussion about desired developments and – with this – policies and investments? This question is raised within Module 3 of the PLUREL project. The motivation of the regions to take up this challenge is essential for developing a common tool for sustainability impact assessment for peri-urban areas.

### Focus on stakeholder involvement

During 2007 and 2008, the first two years of case study research, two trajectories run parallel: 1) study of spatial planning and governance strategies and 2) data collection. The first trajectory comprises the identification and analysis of stake-

*Research priorities for the PLUREL case study areas.*

Issue	Leipzig	Warsaw	Koper	Montpellier	Haaglanden	Manchester	Hangzhou
Land pressure due to housing development (/industrialisation) in the urban fringe	1 <sup>st</sup>		1 <sup>st</sup>				
High value natur areas in the urban fringe at risk	2 <sup>nd</sup>	2 <sup>nd</sup>				1 <sup>st</sup>	
Agriculture not able to resist pressure	3 <sup>rd</sup>		2 <sup>nd</sup>		2 <sup>nd</sup>	2 <sup>nd</sup>	2 <sup>nd</sup>
Traffic pressure	2 <sup>nd</sup>					3 <sup>rd</sup>	
Shrinkage	1 <sup>st</sup>						
Integration tourism	3 <sup>rs</sup>			3 <sup>rd</sup>			3 <sup>rd</sup>
Water management		3 <sup>rd</sup>					

holders and their interests and strategies. Perceptions, hidden agendas, bottlenecks and impediments in terms of written or unwritten rules of the game will be described. This work will be followed by group discussions within and between the regions, based on a set of criteria for assessment of strategies. These discussions are to expose the regions to other approaches and ways of thinking, revealing common problems and needs. For the researchers these activities will contribute to deepened scientific knowledge and a solid basis for the formulation of enhanced strategies.

The Joint Analytical Framework of Module 3 proposes a first set of criteria for the assessment. Among them is the criterion whether a strategy helps to timely influence the developments in case of urgency. This criterion results from the need to preserve high value nature areas in peri-urban areas that are at risk due to previous conservative regulations that might come to an end. This is the case with the Buffer zone policy (»Bufferzonebeleid«) in Haaglanden. But also new and unexpected urban pressures in areas with a transition economy, like in Warsaw and Koper, give rise to the need for timely responses that have a wider support. This support comprises yet another criterion: is the strategy able to generate support of the public, of business and other stakeholders, such as neighbouring authorities or water boards? In the Module 3 stakeholder meeting to be held in Koper, these criteria will be developed further to prepare the module's second year's research work.

The second trajectory of case study research feeds into the other modules of PLUREL. It consists of data collection. Statistical data, for example on population, traffic, housing density and incomes are needed, as are spatial data. These provide inputs to the modelling of trends, land use relationships and the impact assessment of the strategies that are undertaken in Module 3.

#### **Regional strategies and tailor-made knowledge**

At the end of the second project year, the two trajectories described above will meet when it comes to testing the models and modelling the impacts of the different regional strategies in terms of ecological, economic (costs) and social sustainability. This information is needed for the



PHOTO: JOE RAVETZ

development of regional strategies. But it may also be used to advise policy makers at European or national level on how to contribute to the sustainability of the peri-urban areas of European regions.

The dissemination of tailor-made knowledge to authorities, businesses or civic groups will be done in the year 2010. Dissemination tools will include workshops, brochures and/or a DVD. It is essential that the knowledge gathered through international cooperation is returned to the different regional settings, in local language and accessible forms. It is a clear strength of PLUREL that sufficient time and resources have been allocated for dissemination activities.

#### **Using complexity theory**

Aside the modelling exercise by the other research modules, Module 3 contains an alternative approach to studying and representing the reality of land use developments in the peri-urban areas of Europe, namely that of complexity theory. Planning processes in the case study areas will differ from simple to highly complex. Planning situations are not necessarily linear. They can include many uncertainties, sometimes leading to

unpredictable results. Part of Module 3 is to understand the nature of these complex and unpredictable processes by combining complexity and planning theory. Module 3 will make a contribution to transition management, to how to recognise moments of transition, and to support and/or influence these transitions. This knowledge should help planners to anticipate unexpected developments and to manage developments in peri-urban areas in phases of rapid and unexpected transitions.

#### **Board of Stakeholders**

To strengthen research-practice cooperation within PLUREL, its management set-up contains a special body, namely the so-called Board of Stakeholders. PLUREL developed this novelty with the intention to give more weight to the concerns of stakeholders from the regions it collaborates with. The Board has an official and advisory role to the project's scientific coordination team. Each region has a representative in the Board and stakeholders such as politicians, environmental NGOs and planners can communicate with their own representative in the Board.

*Carmen Aalbers,  
Alterra Green World Research*

# A shrinking city with suburban growth?

## Leipzig, Germany

The conurbation of Leipzig-Halle (4,387 km<sup>2</sup> and 1,073,467 inhabitants) has a long history as an important urban centre in Central Europe. Leipzig was first mentioned in official documents in the year 1015. The core of the urban region, the city of Leipzig (with 530,000 inhabitants in 1989 and 501,000 in 2005), is presently challenged by suburban growth and international investments on the one hand, and inner-city shrinkage, emigration and extremely low rental costs on the other.

In the eastern part of Germany, the former socialist German Democratic Republic (GDR), processes of urban sprawl were almost unknown during the post-World War II period. This was due to the socialist planning system directing investments primarily to urban centres such as Leipzig. Only the building of the

notorious prefabricated housing estates on the urban fringes could be seen as a peculiarly »socialist variant« of urban sprawl. In Leipzig, such estates provided housing mostly for people from old, run-down built-up areas and from demolished villages of the open-pit mining area south of the city. Apart from the inner city, which consists of a solid, dense structure of 19th and 20th century tenement blocks, the city's territory contains large areas of the typically suburban mixture of land uses. These include agricultural open land, forests and restoration areas.

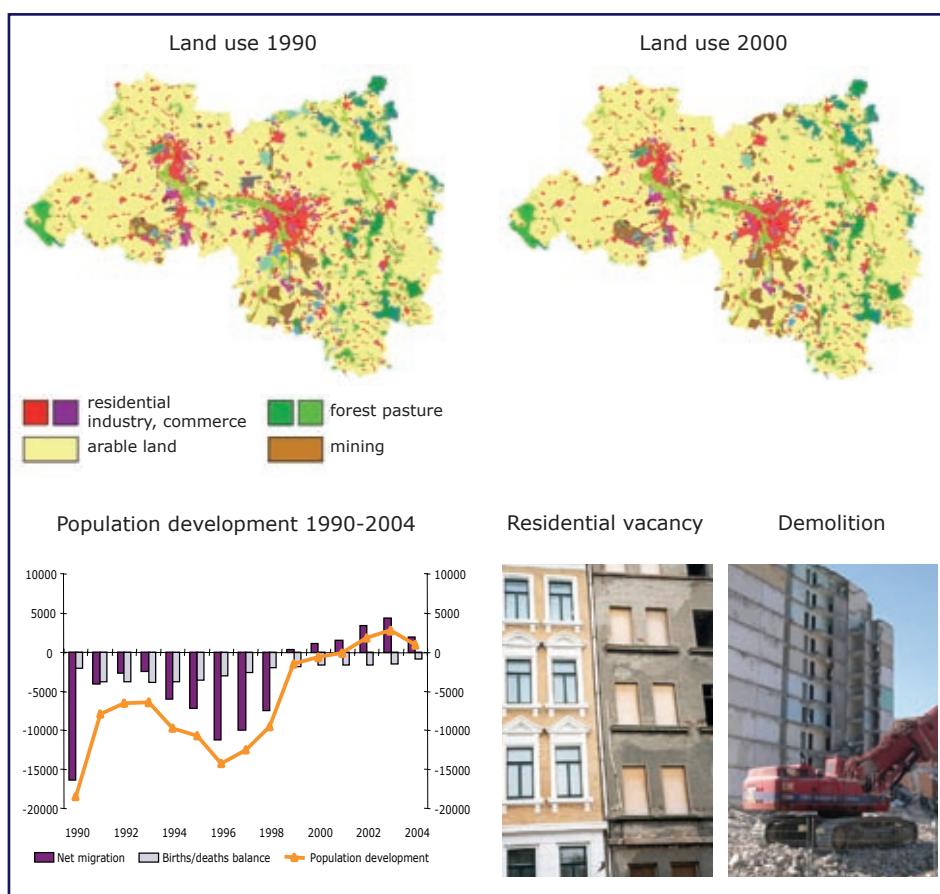
Before and after the GDR, however, large-scale changes in land use were quite common in the region. The city experienced a period of vibrant growth between around 1870 and 1930, reaching its historical maximum population

of over 700,000 in the early 1930s. This made Leipzig into Germany's fourth-largest city and one of the most densely populated ones at the time. City development was accompanied by urbanisation of what were then the city's rural surroundings. From 1989, post-socialist transformation ushered in a period of heavy urban sprawl, with shopping malls, enterprise zones and residential »parks« spreading – in this order – in the city's outskirts and into the suburban townships. Industrial decline, low birth rates, emigration, and residential vacancies, however, contradicted the expectations linked to these investments. This eventually led to a large oversupply on the markets for housing, office space and developed land in general.

Since the late 1990s urban sprawl around Leipzig has abated considerably. Currently, the administrative territory of Leipzig covers almost 30,000 ha (298 km<sup>2</sup>), following the recent incorporation of several suburban towns and villages. Leipzig's present situation is rather paradoxal, turning it into an interesting case for PLUREL. Ongoing dynamics of suburban growth (single and semi-detached housing settlements, new »housing parks«) with adjacent, partly over-dimensional construction activities at the urban fringe should be acknowledged. Simultaneous depopulation and related shrinkage, residential vacancy, and »perforation« followed by demolition in the inner city areas also need to be considered. The main PLUREL research question for the Leipzig region is the following: how do we steer sustainable land use development in an urban region with close neighbourhoods of »islands of suburban growth« and urban decline, abandonment and shrinkage?

The Leipzig region is a representative example for carrying out an ex-post analysis of social, economic and environmental consequences of post-socialist, highly dynamic land conversion, extreme urban sprawl and considerable shrinkage under conditions of demographic change. The city's interest in shrinkage issues is demonstrated by various international events on the issue hosted during the past decade, such as the exhibition of »Shrinking Cities«.

Dagmar Haase and Nina Schwarz,  
Helmholtz Centre for Environmental  
Research – UFZ



# Promoting regional governance in land use planning

Warsaw, Poland



PHOTO: ARKADIUSZ ZIOŁEK

Warsaw, the capital city of Poland, is a compact city surrounded by predominantly rural municipalities. The city has features of a metropolitan city and is the most dynamic Polish city in terms of economic development and population growth, even though Poland as a whole, as well as the country's overall urban population have experienced a stagnating population. Warsaw, like other metropolitan cities in Central and Eastern Europe, undergoes processes of rapid suburbanisation. The Warsaw region is also subjected to extensive urban sprawl. These phenomena were the most important arguments for developing new legal tools for meeting the challenges resulting from rapid urban growth. New legislation on spatial planning was enforced in 2003. This legislation calls specifically for preparation of spatial development plans for metropolitan areas in order to guide and manage dynamic development processes. Such a plan for the Warsaw Metropolitan Area (WMA) is currently being prepared by the Mazovian Office of Regional Planning, an office subordinated to regional (Mazovian Voivodship) self-government. Although there are many functional links between Warsaw and the municipalities situated in the

urban region, there are only few examples of cooperation between Warsaw and these municipalities, or amongst the municipalities themselves. This is because the structure of local governments in the urban region is decentralised and fragmented; collaborative practices in terms of governance are poorly developed. Thus preparation of the WMA spatial development plan and elaboration of development policies for the whole WMA as well as their implementation comprise major challenges that require new innovative approaches and tools.

As governance practices are undeveloped and extremely rapid, uncontrolled suburbanisation processes and economic development are taking place, a number of problems arise. These problems relate to traffic congestion, solid waste disposal and encroachment of residential and commercial development on agricultural and forest land. A considerable part of peri-urban development occurs in unincorporated (i.e. formally rural) territory and shows typical characteristics of a sprawling land consumption.

Within PLUREL, the team of the Polish Academy of Science in cooperation

with national stakeholders is working on identifying areas of spatial conflicts and critical spheres of policy making and spatial planning which need to be addressed to make management of development processes effective. There is an urgent need for rationalisation of the process of land development process and land use change. Moreover, likely demand for various functions (sectors) need to be assessed for different planning perspectives – 5, 10, 20 years – in terms of size (volume) and characteristics such as quality, interdependence between activities, and site. Results of the research activities should help predict and estimate the different consequences (e.g., ecological, demand for transportation infrastructure) of development processes and guide them to match the demand and supply sides. Studies should also provide tools and methods of coordination of planning and decision making processes in situations characterised by a large number of autonomous local governments. In this way, land use governance in the Warsaw urban region can be strengthened.

*Miroslaw Grochowski,  
Polish Academy of Sciences*

# Attractive urban landscapes as competitive advantage

Hangzhou, China



PHOTO: HE YOUNG

The city of Hangzhou is located in the rapidly developing Yangtze River Delta stretching from Shanghai over Hangzhou to Ningbo. The city of Hangzhou alone has around 4.1 million registered inhabitants (2006 census), a figure to which unregistered residents must be added. Measured on the basis of registered population the city population has grown about 1.2-1.3 percent per year since 1980.

Hangzhou has several economic development zones established in the early 1990s. These have received massive foreign investments and house internationally as well as Chinese owned companies. Since the introduction of the economic development zones the economy of Hangzhou, measured as the GDP of the larger administrative region of Hangzhou, has maintained an annual growth rate of more than 10 %.

Population growth and rapid urban development create a demand for urban

expansion. This is catered for by the city of Hangzhou through outward urban growth and, for the longer term, through the planning of self-contained satellite towns that will surround the core area of the city. Due to the scarcity of developable land as well as recent national legislation that reinforces farmers' rights to the land and makes urban expansion more difficult and expensive, high emphasis is put on efficient land use. Thus older villages are demolished and developed, together with the surrounding green field sites, into new subdivisions with very high floor-space ratios.

The pragmatic pursue of efficient land use is paralleled by a clear objective of the city administration to improve the quality of life and create an attractive environment for tourists as well as for the inhabitants. This is reflected in the 11th five-year plan for Hangzhou's Economic and Social Development that aims to create a »paradisiacal Silicon Valley« and

to build a well-off society in all ways. The Strategic Plan as well as the Plan for the Construction of an Ecological City are important instruments for implementing this vision. The Ecological City plan aims to apply ecological principles and systems engineering to improve the environment and environmental performance of the community, including maintenance and provision of green spaces to enhance the quality of life.

A major example of the city of Hangzhou's dedication to an ecology inspired quality of life strategy is the protection of the famous West Lake area, a historical lake and park landscape close to the city centre. Another example is that of the establishment of additional recreational sites within the urban area, such as the Xixi wetlands.

Hangzhou is a rapidly developing urban region which is strong in attracting services and high tech industries. Apart



from locational advantages, a main reason for the success of Hangzhou is its image of being one of the most liveable cities in China because of its cultural heritage and attractive landscapes. These soft factors are likely to become even more important for the future economic development of Hangzhou. Therefore, the protection and sustainable development of these values will be a major issue for the future of the city region. This includes the development of strategies that successfully balance the need for urban development with the protection of farmland and open space. Farmland in close vicinity to the urban core will not only continue to be important for the production of food and other produce (e.g., silk). It also needs to be strengthened as a carrier of the city region's future green structure for recreation and environmental services.

Thomas Sick Nielsen and Stephan Pauleit, University of Copenhagen

# PLUREL People

*Interview with Carmen Aalbers, Alterra Green World Research*



## **What is your role in PLUREL?**

First of all I am coordinating between the efforts of the national research teams that work in the seven case study regions. We need to make sure that local insights and expertise are properly integrated and considered within PLUREL. This may require unorthodox research. My second task is to promote stakeholder involvement in both local and project-wide PLUREL activities. Research-practice cooperation has many faces, and my ambitions in this respect are rather high. I want PLUREL to produce results that are relevant, usable and accessible to stakeholders in European urban regions. My third role, as Module 3 coordinator, will be to closely collaborate with the coordinators of the other module and workpackages.

## **How will PLUREL benefit from your own expertise?**

My international experience at policy as well as »field« level in land use planning and collaborative natural resource management should be beneficial. As project manager and researcher, I have always worked in close cooperation with practitioners, and have in fact been a practitioner myself. My focus on practical needs and associative way of working should benefit PLUREL.

## **What will be PLUREL's most important results?**

Ours is the only green open space related Integrated Project under the Sixth Framework Programme that studies the (peri-) urban context. Several Fifth Framework projects (within the City of Tomorrow

theme) called for more attention for peri-urban areas because of their marginal position in administrative areas, be it rural or urban. In my view, PLUREL should provide European policy makers with insights and advice on sustainable development options for these areas. As far as models can be developed to contribute to these insights, PLUREL should develop them. On the other hand, the models and insights should also be accessible to the regions themselves, through tailor-made knowledge dissemination.

## **Which challenges can stand in the way of PLUREL's success?**

The combination of today's complex urban world and an integrated research approach constitutes a challenge. Sound cooperation between different research disciplines is essential for project success. Boundaries between research disciplines are generally very resistant and even the most motivated and capable researchers are not always able to overcome them.

## **Why should policy makers be interested in PLUREL?**

As policy making body, the European Commission's Directorate General for Science, Research and Development is interested in tools that forecast developments in peri-urban areas. Policy makers from urban regions should be interested in our work as well, because the use of PLUREL findings might have an effect in their domain. Our project is open to cooperation with policy makers. We have even created a special body for this: the Board of Stakeholders.

## **Announcement of International Conferences**

### **Title:**

»Multifunctional Land Use in the Rural-Urban Perspective«

**Dates:** 7<sup>th</sup> – 9<sup>th</sup> of November 2007

### **Venue:**

Bled, Slovenia

### **Organisers:**

European research network »Landscape Tomorrow« et al.

**For further information:** <http://www.bf.uni-lj.si/ag/hidrologija/LTConference/>

### **Title:**

»Impact Assessment of Land Use Changes«

**Dates:** 6<sup>th</sup> – 9<sup>th</sup> of April 2008

### **Venue:**

Humboldt University, Berlin, Germany

### **Organisers:**

SENSOR, EFORWOOD, PLUREL and SEAMLESS projects

### **For further information:**

<http://www.sensor-conference2008.eu/>

# PLUREL



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- University of Copenhagen, Denmark
- Helmholtz Zentrum für Umweltforschung, UFZ, Germany
- Leibniz Centre for Agricultural Landscape Research, Germany
- Alterra Green World Research, The Netherlands
- IIASA, International Institute for Applied Systems Analysis, Austria
- ARC systems research GmbH, Austria
- Institute for Local Government Studies, Denmark
- The Finnish Environment Institute, Finland
- University of Paris I & COE/CCIP, France
- Agricultural and environmental engineering research centre, CEMAGREF, France
- Centre for European Economic Research GmbH, Germany
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- Studio Mediterana, architecture designing, advisory and investment inc., Slovenia
- Munich Design International, Germany
- RAL2005 Architects, The Netherlands
- University of Groningen, The Netherlands
- Queen's University Belfast, United Kingdom
- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France
- University of Edinburgh, United Kingdom

## **Peri-urban Land Use Relationships**

*Strategies and Substanability Assesment Tools  
for Urban-rural Linkages*

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**www.plurel.net**



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# Scenarios – crystal balls for the urban fringe

**Scenarios as »stories of the future« can help in dealing with rapid and unpredictable change in urbanising societies. The PLUREL project applies four different scenario storylines to explore the possible futures for Europe's urban and peri-urban areas.**

## Managing change and uncertainty

In 2007 the urban dwellers of the world became the majority of the population, for the first time in history. But there are new questions about the nature of cities, in the face of increasingly rapid and unpredictable change:

- Are traditional cities spreading further

and wider into peri-urban areas?

- Are large parts of the countryside being transformed into metropolitan extensions, by global communications and economic restructuring?
- In the Europe of 2050, will the peri-urban be an area of wealth and diversity, or decline and fragmentation?

For such questions there are no fixed or right answers. Instead, exploring future scenarios can be more useful – a way of imagining future possibilities, analysing the consequences, and constructing practical responses.

Scenarios are »stories of the future« – providing a tool for the investigation of possible future conditions and trends, risks and opportunities. As in the first cartoon, they can take different forms:

- Stories (which can be more fictional, or more realistic).
- Models (technical and quantitative: or, more conceptual and qualitative).
- Images (visual or narrative).
- Visions (positive hopes or negative fears).

Above all, scenarios call on creativity and imagination. The predictions of science fiction writers are often more accurate than those of engineers or economists, shown by examples such as Web 2.0, the new generation of the Internet, geo-stationary satellites and derivative trading.

#### The scenario framework

Scenarios are best organised in a framework which provides a clear logic and structure for comparing different possibilities. Module 1 of the PLUREL project, aimed at building visions of the future of rural-urban regions, developed such a framework based on the global scenarios of the IPCC (Intergovernmental Panel on Climate Change), known as SRES (Special Report on Emissions Scenarios). These scenarios were then adapted to the PLUREL agenda:

- Applying the global scenarios to the EU space, up to the years 2025 and 2050.
- Developing a series of possible and plausible »shocks«, i.e. rapid and important changes in particular sectors or themes.
- Focusing on the implications of each scenario for urbanisation and peri-urban land use change.

The result is shown as a 2 x 2 framework as in the overview diagram, with code letters borrowed from the IPCC scheme. The vertical axis is concerned with globalised and top-down dynamics, versus localised and bottom-up dynamics. The horizontal axis focuses on public and collective values, versus private enterprise values. The results of the shocks with implications for urbanisation can be summarised:

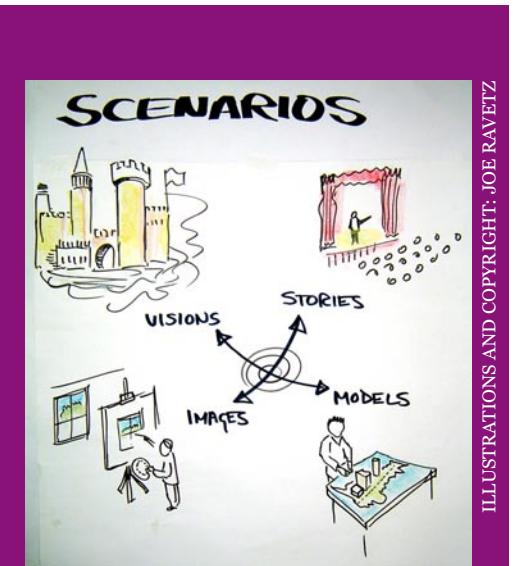
- *A1 – high growth*: rapid development in information and communication technology (ICT): rapid counter-urbanisation.
- *A2 – self-reliance*: rapid climate change and water crisis: defence of the cities.
- *B1 – sustainability? energy price shock*: localisation of activity.
- *B2 – fragmentation*: pandemic disease: polarisation of cities.

In the scenario narratives shown on the next page, the main titles show the general direction of the scenario, while the titles in brackets show a more colourful interpretation of the »shock« variation.

#### Implications and next steps

The four narrative storylines are being used in the PLUREL project as the basis of »top-down« modelling work on economic, demographic, environmental and land use changes. The scenarios are then extended with more spatial and geographical details to examine the effects on different urban types. This needs more than technical calculations – for instance, does the »peak oil« scenario mean that people will cluster in large cities, or decentralise to a wired-up countryside? So much depends on lifestyles, values, policies and cultures.

Elsewhere in the PLUREL project, the »top-down« scenarios are the starting point for the exploration of regional »bottom up« scenarios within each of the case studies, which take on board the

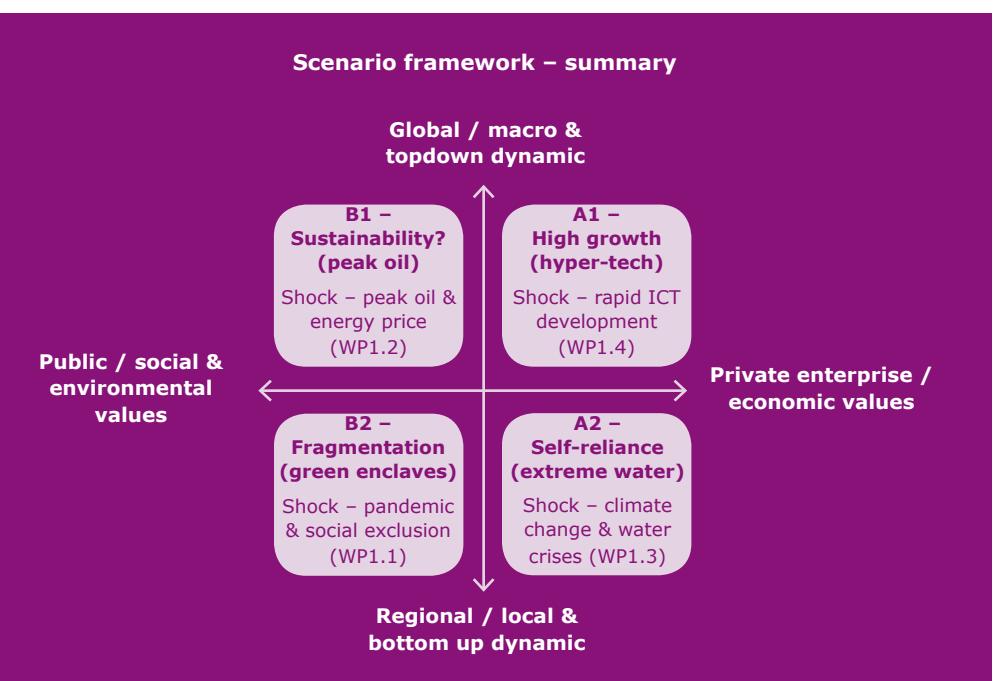


As illustrated here, scenarios can take the form of stories, models, images or visions.

most topical issues and responses in each location. Other components of the project will also draw on the scenario resource, with both technical and non-technical material.

So, the PLUREL scenarios provide a starting point to explore the possible futures for Europe's urban and peri-urban areas. They shine a light into four »cloudy crystal balls«, not with the aim of forecasting the future, but in helping to understand and work with it.

*Joe Ravetz, University of Manchester, and Mark Rounsevell, University of Edinburgh*



## A1 – high growth scenario (hyper-tech)

This describes a future world of rapid economic growth, global population that peaks in mid-century, and the rapid spread of more efficient technologies. Investment in research and development is high and nations share knowledge and pool resources in a global research market place. Energy prices decline because supply is driven by new developments in renewable energy production and nuclear fission. The shock concerns the rapid acceleration of ICT which transforms home and work as never before.

For peri-urban areas in Europe, this scenario is likely to see small »polycentric« towns and cities become even more popular. New transport technologies lead to more rapid journeys and the expansion of the commuting distances around towns and cities. This leads to peri-urbanisation and »metropolitanisation« of rural areas on a massive scale.



## A2 – self-reliance scenario (extreme water)

This describes a more heterogeneous world of self reliance and preservation of local identities. While the population increases, economic development is primarily regionally-oriented, and per capita economic growth and technological change are more fragmented and slower than in the other storylines. The shock here is subtitled »extreme water«, and this sees rapid increase in flooding, drought and sea level rise. A year does not go by without a major event, and in some cities and regions development is seriously constrained.

Peri-urban areas are strongly affected; affluent yet vulnerable city-regions such as London or the Dutch Randstad spend huge sums of money on defence and adaptation strategies. Population growth due to climate-induced migration puts more pressure on urban infrastructure and services.



## B1 – sustainability? scenario (peak oil)

This describes a future of environmental and social consciousness – a global approach to sustainable development, involving governments, businesses, media and households. Economic development is more balanced with rapid investment in resource efficiency, social equity and environmental protection. The »shock« in this scenario is driven by the real possibility of »peak oil«, that is, a decline in global oil production after reaching maximum production, leading to rapid rises in energy prices, with many social and economic effects.

For peri-urban areas, high energy prices have an enormous effect on location choices as transport costs limit commuting distances. Although tele-working is encouraged, most people attempt to return to larger cities and towns, and more remote rural areas decline.



## B2 – fragmentation scenario (walls and enclaves)

Europe sees a fragmentation of society, in terms of age, ethnicity and international distrust. The voter-strong elderly population becomes increasingly dependent on the younger generation, but the working-age population is disinclined to transfer their resources, with growing intergenerational conflicts.

Here the shock is caused by a human pandemic, possibly transmitted by animals or birds, which spreads rapidly and leads to severe restrictions on the movement of people and trade. The ethnic division of cities is driven by the increased in-migration of the working-age population from outside and within the European Union. Cities become more dispersed as younger migrants dominate city centres and older natives populate the outskirts and enclaves outside the cities – so that peri-urban areas become peri-society areas.



# Climate change: a rural-urban region perspective



PHOTO: COPYRIGHT MARK YUILL/FOTOLIA.COM

**Climate change is an all-encompassing process, and will be a significant driver of change in rural-urban regions. These regions also have an important role to play in reducing the threat of climate change through lowering their greenhouse gas emissions. PLUREL looks at the crucial role of rural-urban regions in climate change mitigation and adaptation.**

## Impacts of climate change

The evidence for global climate change and the central role that humans play in driving this process is now overwhelming. The reduction in the extent of the polar ice sheets, retreating glaciers, increasing temperatures and rising sea levels all provide visible evidence of the impacts of a changing climate. Scenarios such as those developed by the Intergovernmental Panel on Climate Change (IPCC) provide a means of visualising what the future might look like as climate change takes a firmer hold. In Europe, figures for annual precipitation change show a stark north/south divide. Southern Europe could potentially receive 20-30% less rainfall by the 2080s, whilst Northern Europe could receive 20-40% more. Concerning

temperature change, the picture is more consistent with all of Europe projected to become warmer. Some regional variation can nevertheless be expected with annual temperatures projected to rise by up to 5 °C in Northern Europe by the 2080s, and up to 3.5 °C in parts of Southern Europe.

## Impacts on rural-urban regions

The scope of the climate change challenge is all-encompassing. However, PLUREL's focus on rural-urban regions provides the boundary for this discussion. The impacts of climate change in rural-urban regions fall into several separate yet interlinked categories. These include biophysical impacts (e.g., loss of biodiversity, increase in forest fires, droughts and flooding), social/cultural impacts (e.g., impacts on human health and well-being, lifestyle changes), economic impacts (e.g., financial cost of flooding, development of new energy markets and technologies) and political impacts (e.g., development of new legislation and policies).

The variation in climate change projections across Europe indicates that the nature and extent of these impacts will differ according to geographical location.

## Mitigation and adaptation strategies

Rural-urban regions are drivers of climate change through the release of greenhouse gas emissions, yet they are also impacted on by its effects. This reveals the two core elements of the climate change agenda; mitigation and adaptation. Rural-urban regions have a crucial role to play in addressing both issues. Mitigation concerns reducing greenhouse gas emissions. Issues such as urban form, transport, energy generation and housing provision are central to emissions reduction, and are also crucial in the context of the development and future evolution of rural-urban regions. Adaptation concerns reducing vulnerability and increasing resilience to climate change impacts.

Considering the form and function of rural-urban regions is vital to developing effective adaptation strategies. Research undertaken by the Centre for Urban and Regional Ecology (University of Manchester) has highlighted the significant role that green space can play in helping to adapt urban areas to climate change impacts such as flooding and heat stress. Further, design of development can help to adapt to flooding through, for example,

raising floor heights, using water resistant plaster and locating electric cables above projected flood levels. Despite the extent of new development and urban sprawl across Europe, the turnover of building stocks is relatively slow. This increases the importance of retrofitting for both mitigation and adaptation, which refers to the modification of existing development to meet climate change challenges, for example through improving insulation or opening up green spaces around buildings.

#### **Mitigation-adaptation conflicts**

During the implementation of such strategies, potential conflicts between mitigation and adaptation responses must be considered. This is an area for further consideration in planning and design. A good example of a potential mitigation/adaptation conflict concerns the issue of density in urban areas. Classically, increasing density is seen as a way of reducing energy use (and hence greenhouse gas emissions) by, for example, lowering travel demand and space heating requirements. However, by increasing density in urban areas green space resources may come under threat, leading to the loss of a vital adaptation resource. Clearly there is a sensitive balance to strike when thinking about the best ways to address the causes and threats of climate change in rural-urban regions. Careful long term planning and strategy making is vital.

#### **Dealing with the climate change challenge**

There is a huge challenge to be faced to keep climate change from reaching the point where catastrophic chains of positive feedback lead to impacts that would be very difficult to manage. The EU aims to keep temperature rise to 2 °C above pre-industrial levels, the point at which it is thought that »runaway« climate change will become difficult to prevent. This in itself will take an incredible effort from all sectors of society as current atmospheric concentrations of CO<sub>2</sub> are already at or close to the level that will commit the globe to a 2 °C rise. Exploring the contribution of rural-urban regions to climate change mitigation and adaptation has never seemed more relevant and urgent.

*Jeremy Carter, University of Manchester*

# End users have their say in the PLUREL Board of Stakeholders

**As described in the previous issue of the PLUREL Newsletter, stakeholder involvement is a key element of the project. A Board of Stakeholders has now started its important advisory work.**

#### **One stakeholder for each case study region**

During PLUREL's project meeting in Leipzig (October 2007), a formal Board of Stakeholders was established. It comprises one stakeholder from each of the project's seven case study regions. Most of the members of the Board work for regional authorities, except for Mr. Houtzager, who is a politician, and Mr. Medved, who is a representative from a national NGO. The Board will attend the PLUREL project meetings, during which their participation in the research discussion is actively promoted and facilitated. It will support the project with advice and by reviewing research outcomes. In between the project meetings, stakeholders will be kept up-to-date on PLUREL's progress with targeted e-mail newsflashes.

#### **What stakeholders ask**

The Board has already stated that PLUREL can help practitioners to understand current urbanisation trends in Europe and their consequences. PLUREL can provide tools to guide effective development processes, and achieve an appropriate balance between urban and rural areas and interests. This could concern, for example, the growth of quality green spaces and corridors stretching from inner cities to the urban fringe, but also sustainably managed land from the city periphery through to more rural areas. Practical tools are needed for evaluation, forecasting, planning and implementation of strategies. Research on functional relationships between Drivers, Pressures, Status, Impacts and Responses (DPSIR)

#### **Members of PLUREL's Board of Stakeholders:**

- J. Paul Gambier, Montpellier, France
- Dietmar Rohl, Leipzig, Germany
- Tomasz Slawinski, Warsaw, Poland
- Andrej Medved, Koper, Slovenia
- Marcel Houtzager, Haaglanden, Netherlands
- Pam Warhurst, Greater Manchester, UK
- Fu Lihuan, Hangzhou, China

in urban-rural land use is a crucial part in preparation of these tools.

#### **Key issues and research advice**

From the stakeholders' perspective, the following key issues covered by PLUREL can have an important impact on the practice of planning and governance:

1. Translation of driving forces and trends into demands on land use and resources.
2. Identification of strengths and weaknesses in development strategies.
3. Identification and analysis of governance and management practices.
4. Preparation of scenarios and evaluation of potential consequences of different strategies.
5. Modelling of multifunctional relationships between rural, peri-urban and urban land use.

The Board is ready to provide advice on how research should meet the concrete needs of practitioners in Europe. It will support researchers in their efforts to obtain results that are valuable both from a scientific and a policy-making perspective. Moreover, the Board will support PLUREL Project Management in highlighting policy relevant results and in ensuring adequate dissemination of key findings.

*Marion Bogers and Carmen Aalbers,  
Alterra*

# The challenges of ageing

**Ageing is an inevitable process which poses a challenge to policy makers across the world. Greater understanding of trends and regional differences, for example between urban and rural areas, will assist in the development of strategies to deal with the ageing challenge.**

## Inevitable ageing

Population ageing is universal and inevitable. It is the outcome of changes which have been aspired to through large parts of human history: mortality decline and individual childbearing choices. The United Nations 60th World Economic and Social Survey (2007) concluded that *«a substantial degree of population ageing is expected over the next few decades in all regions of the world ... [It is] unlikely that policy interventions intended to encourage childbearing in low-fertility countries could substantially alter this expectation. ... [N]o plausible assumption about international migration levels would have more than a moderate impact on the expected degree of population ageing that will be experienced in future decades by countries all over the world.»*

## Ageing in Europe and Asia

Although Europe is one of the first world regions to experience population ageing, a large part of Asia (including China) is projected to undergo rapid ageing as well. Fears exist in Asia that, unlike Europe, the region will “grow old before it grows rich”, suffering larger challenges to old age social security. The decline in mortality and fertility has occurred over a longer time period in Europe than in most other world regions. In several European countries, a sustained mortality decline started as early as the 18th century, i.e., much earlier than in the rest of the world. The fertility decline, which brought the average number of children towards replacement fertility levels and below, has been ongoing for more than a century in several European countries. In some Asian countries, including China, this transition has taken only three to four decades. Thus European governments have had longer to adapt compared to most other ageing



PHOTO: THOMAS SICK NIELSEN

regions in the world. Nevertheless, several governments disregarded foreseeable demographic changes and only initiated required policy responses, such as the need to extend the working life, at an unnecessarily late point in time.

## Dealing with ageing

The age structure of a population can be projected with a substantial degree of accuracy. Although uncertainties in migration, fertility and mortality will have some impact, ex-post analyses of past projections have shown that age composition has been predicted relatively well. In particular, the age structure and numbers of individuals above the age of 50 half a century into the future can be predicted with a relatively low degree of uncertainty, as these individuals are already born. Policies intended to increase fertility will not halt population ageing, but they could

slow it down. This would be in accordance with European women's fertility preferences which tend to be higher than realised fertility levels. In other words: European women would like to have more children than they end up having. The largest potential could be people with a higher education for whom the gap between desired and actual fertility is the highest. Reforms in education systems could narrow this gap, for example by providing better financial support to those who choose to combine childbearing with a period of study. Also, introducing more efficient schooling systems, allowing people to graduate from university and other tertiary education at a younger age, could decrease the trade-off between education and fertility.

## Regional and economic impacts

Ageing tends to follow a distinct spa-

# PLUREL People



*Interview with Mark Rounsevell, University of Edinburgh*

tial pattern, where the impact is more pronounced in rural than in urban areas. Densely populated urban areas will tend to experience much less ageing or declines in population size, particularly due to strong urbanisation trends for the youth. Some rural areas of Europe, including parts of Germany and Sweden, are projected to experience both ageing and population decline, which poses challenges to local economies, health and elderly care provision.

An increase in retirement age could imply for several countries that the economically active/inactive ratio remains constant, or decreases only moderately, in spite of ageing. Male effective retirement age varies substantially across Europe. Between 2000 and 2005, the French retired at 59, the Icelanders at 69, while other Europeans retired at ages in between. Improvements in health and education levels of current and future older age groups imply that the productivity potential amongst the elderly is increasing over time. This suggests that there is potential for extending the working life in many countries, given appropriate changes in pension systems, seniority-based earnings systems, age-discriminatory practices and norms for when one should retire.

## **Positive effects of ageing**

Population ageing and lower population growth could also have positive effects. Although other factors can be more important (e.g., consumption patterns, heating needs, urbanisation, living arrangements, productivity levels), a smaller population size can lead to a lower use of resources and reduced climate change. Ageing per se can also provide environmental gains to the extent that older individuals commute and consume less than younger individuals. In addition, the distinct income and savings patterns of older individuals can have indirect implications for demand that result in lower environmental emissions.

*Vegard Skirbekk, IIASA*

## **What is your role in PLUREL?**

I have a number of different roles. I co-lead Module 1, which is building visions of the future of urban and peri-urban areas. This has involved the development of a new scenario framework and specifically I'm working on the development of scenarios of future technological change. On top of this, I also have a role in the Agent-Based Modelling (ABM) work in Module 4. ABM is a fantastic new tool to analyse how people and institutions interact, make decisions and change the world around us. I think this approach has tremendous potential to create a step-change in how we understand social systems.

## **How will PLUREL benefit from your specific expertise?**

I have built scenarios in several European Union funded projects over a number of years. Consequently I have contributed as a scenario expert to the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment report, which was a great opportunity to work with some of the world's foremost scenario experts. I hope that some of this experience has rubbed off on the PLUREL project.

## **What will be PLUREL's most important results?**

Probably too many to talk about here, but don't underestimate that one of the most important outcomes is the development of a research community. I'm sure that there will be many spin-offs from this project, and many new relationships built that will benefit European research as a service to society for years to come.

## **Which challenges can stand in the way of PLUREL's success?**

Nothing but ourselves! As a project team we have a great opportunity to show what the research community can achieve in exploring questions that are important to society. We have the resources and we have the expertise. We just have to make sure that we exchange ideas and work together with an open spirit and in good humour to find answers to difficult research questions.

## **Why should policy makers be interested in PLUREL?**

Everyone should be interested in PLUREL, not just policy-makers. This is about the future of Europe and how and where people live within it. This affects everyone. Of course policy makers have the means to really make a difference, and I hope that we can demonstrate the value to them of using the outputs from the PLUREL project.



PHOTO: FABRIZIO UNGARO

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- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France
- University of Edinburgh, United Kingdom

## **Peri-urban Land Use Relationships**

*Strategies and Substanability Assesment Tools  
for Urban-rural Linkages*

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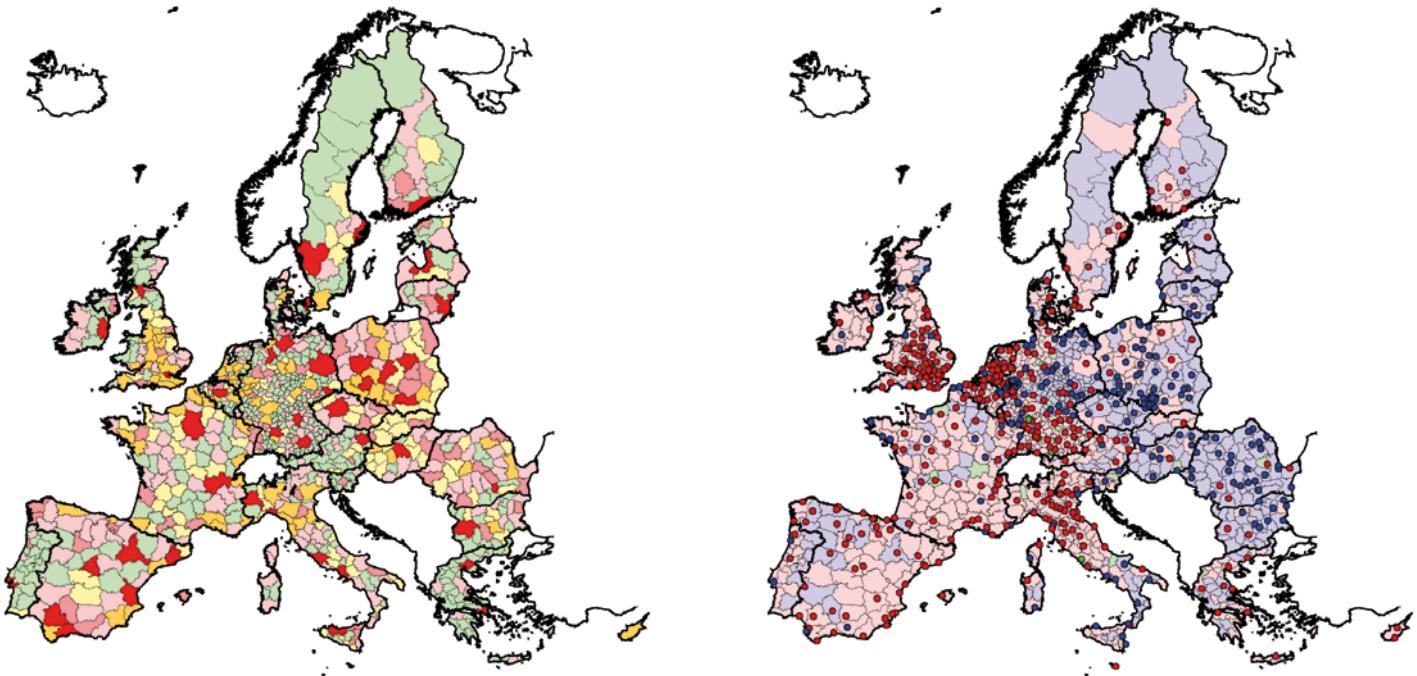
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# Defining region classes with similar characteristics

This article describes the difficult task to delineate Rural-Urban-Regions (RURs) for all of Europe and to develop a RUR typology. The first part of this task is to cluster 1300 regions in Europe into RURs. Next, a compact set of RUR types must be developed, using limited available

data. RUR types should be simple and sophisticated enough to elaborate land use-related response functions, tailor-made for a certain RUR type. They should allow for assessing relations between »drivers« and »pressures« which affect different RUR types in different ways.

## RUR delineation and typology: purpose and principles

A region is defined by its intra-regional relations. Like hierarchical city systems, urban region hierarchies reflect the influence spheres of cities. Assessing urban-rural relations requires certain region characteristics to distinguish between

the influence of neighbouring core cities on their peri-urban and rural surroundings.

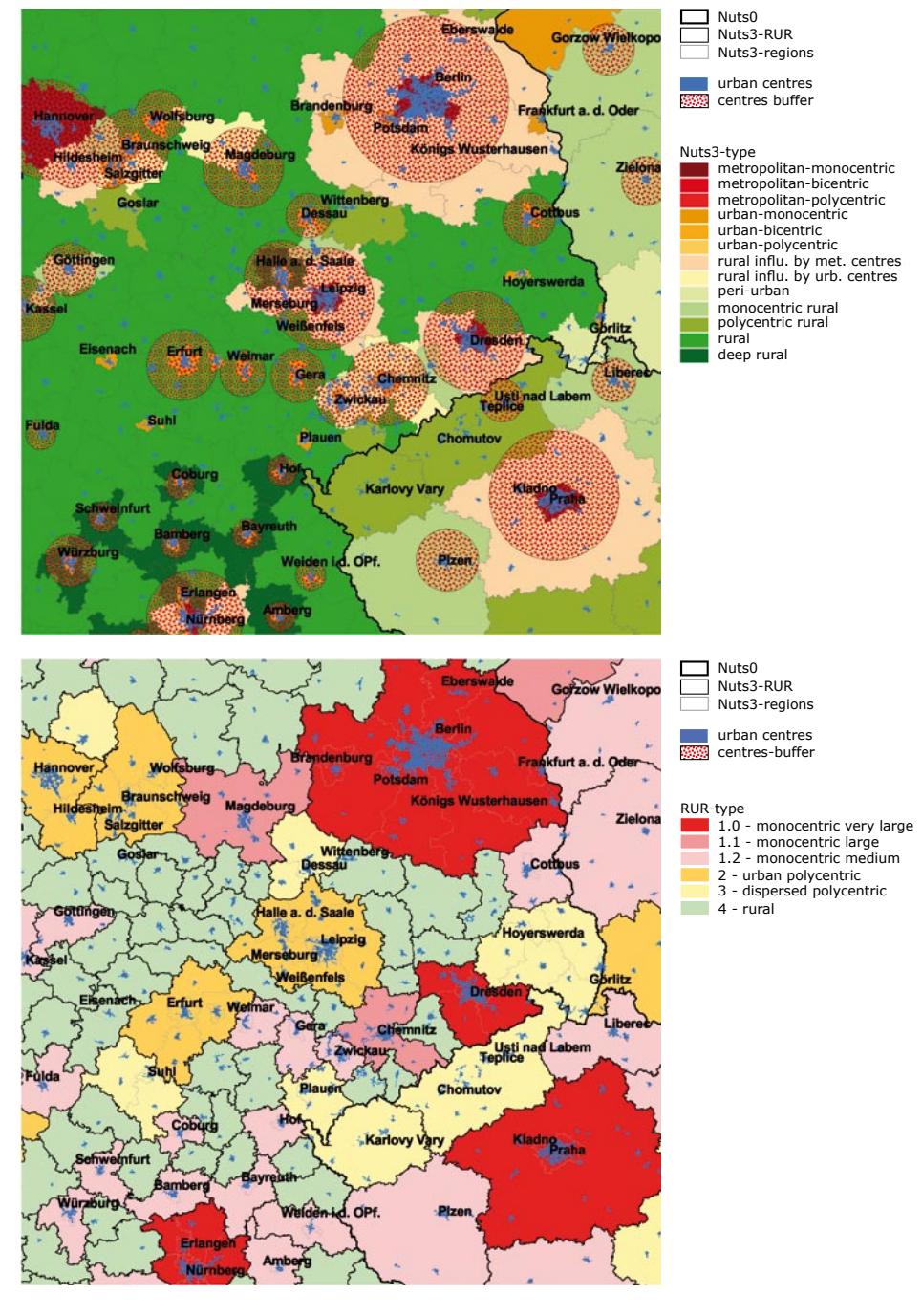
As typologies are developed for certain purposes, they also need to adhere to certain preconditions. The European Commission has identified so-called »NUTS3« regions as appropriate for examining the regional effects of European Union (EU) policies. As PLUREL aims to deliver tools for sustainability impact assessment of urban/peri-urban/rural relationships, the NUTS3 level must be applied as »resolution« for analysis, although it is rather coarse for analysing intra-regional issues.

In PLUREL Newsletter 1 a Rural-Urban Region (RUR) was defined as »the functional urban region reaching beyond the peri-urban commuter belt including the rural hinterland«. Rural-urban regions show certain differences but also similarities regarding distribution of drivers and resulting pressures. A typology will make use of these similarities, helping to identify pressure patterns typical for certain RUR types as response to land-use and interactions. Examining different pressures requires a flexible typology, derived from those spatial features, affected by the respective driver-pressure issues. The typology should support the quantification of very different driver-pressure relations. But it cannot be too detailed if the aim is to develop a manageable set of generic response functions appropriate for basic RUR types. Therefore, three sets of distinct typologies have been developed, allowing for selection for each particular response function:

- Morphology: regional distribution of core city and related sub-centres;
- Spatial dynamics: core city versus surroundings growth- and decline-patterns; and
- Core city shapes: compactness versus fractality of major cities. (This typology will not be presented here because of space limitations.)

#### Applied data

Due to the large number of NUTS3 entities and the European-wide scope of the analysis, RUR delineation and classification must be carried out automatically, using spatial and statistical data and GIS-methodologies. Limited data availability at European level, however, is a key barrier to develop a sophisticated typology. Only few data are available



**Clustering of NUTS3 regions through buffers (top) and final RUR morphology typology (bottom). Berlin-Prague map detail, urbanised settlement areas depicted in blue.**

for the entire EU with its 27 countries (EU27). These include EEA's CORINE land cover 2000, a 100 x 100m raster map with 44 land cover classes. Available data further include population numbers for the years 2000 to 2006 for NUTS3 entities, as the only complete EUROSTAT NUTS3 dataset. Additionally, population data from the GISCO urban centre point data base (STEU) have been applied for 5000 settlements, updated with recent World Gazetteer population numbers.

#### RUR delineation

As first step to delineate RURs, urban centres serving as RUR nuclei have to be identified. Because of the large number of urban settlements in Europe, this selection is conducted automatically, applying land cover and population data with GIS-methodologies. Adjacent land cover patches, identified as parts of settlements, are merged into one settlement area. Settlement areas featuring a STEU urban centre point above 10,000 inhabi-

Dynamic type	Core city	Peri-urban and rural area
GG	Growth	Growth
DG	Decline	Growth
GD	Growth	Decline
DD	Decline	Decline

tants are defined as urban centres and those exceeding 100,000 inhabitants as core cities. NUTS3 entities featuring a core city are defined as RUR centre regions. Buffer circles around the core cities mark commuting and recreation catchment areas, extending the centre regions to »complete« RURs. NUTS3 regions which are significantly overlapped by core city buffers are merged into the respective adjacent RUR centre region. This results, finally, in 900 RURs for EU27 (see the maps on the front page).

### RUR morphology typology

When looking at land-use relationships, (intra-regional) mono- and polycentricity are in focus. These types have to be examined separately, as they trigger very different pressure patterns. Monocentricity conveys boosting urban cores and – in centre-less peri-urban surroundings – undirected settlement dispersion known as urban sprawl. Polycentricity, enhanced by regional planning strategies, supports distributed peri-urban functions, relieving pressures from open space through concentration of activities in urban sub-centres. See the morphology types in the table below.

The typology is conducted together with the RUR delineation (see above). The left-hand map on the front page show the morphology typology results for the entire EU27. Certain major trends become apparent, despite the effects of varying NUTS3-region sizes on the classification. Reddish regions indicate the domina-

tion of urban monocentric RURs. These lack notable peri-urban sub-centres to release core city pressure on open space through urban sprawl. Urban polycentric RURs (orange) are observed in England, Belgium, Netherlands, Slovakia, western Hungary, along Germany's Rhine-Valley and in northern Italy. The majority of rural polycentric RURs (yellow) with some small centres is located in the eastern EU27 periphery (Poland, Slovakia, Hungary, Romania) and scattered over France. The remaining rural RURs (green) without any notable centres are located in mountainous and forested areas in peripheral Southern and Northern Europe, in the Alps and scattered over Germany due to the small NUTS3 entities.

### RUR dynamics typology

Urban regions demonstrate a certain spatial development »lifecycle«, resulting in waves of urbanisation, sub-urbanisation and counter-urbanisation, triggered by increase and decline of drivers (such as birth and migration balance), related activities (housing, production, commuting etc.) and general economic conditions. This urban life cycle exhibits various spatial development patterns, like core city growth as effect of urbanisation, polycentric growth as effect of controlled (sub-)centre expansion or scattered peri-urban settlement growth (urban sprawl) as effect of uncontrolled settlement dispersion. Other development patterns show declining core cities as effect of counter-urbanisation due to general population and activity loss, or declin-

ing peri-urban settlements as effect of population loss in the entire urban region or as effect of core-city re-urbanisation. Different RURs show either identical or oppositional dynamics in core cities and surroundings, resulting in types as seen in the table to the left.

The classification focuses on recent, short-term momentum (excluding e.g. the Eastern/Central Europe catch up dynamics of the 1990s) to observe latest spatial trends in by now economically consolidated urban regions for obtaining hints for future trends. Dynamic classifications have not been carried out using CORINE land-cover, as data are not available for all countries and/or follow inappropriate land-cover classification rules.

Instead, land-cover data and population numbers from different years serve as land-use activity proxy for comparing RUR dynamics in urban centres and non-urban RUR sub-regions. As different population census years for NUTS3 regions and urban centres hamper accurate dynamics observation, we focus on general dynamic trends rather than on explicit rates. The right-hand map on the front page presents the dynamics typology for RUR centres with coloured dots and for non-urban surroundings as coloured polygons.

A major West – East trend can be observed: a general (population) decline in Eastern Europe and some decline in peripheral, rural RURs in the Mediterranean area, in Scandinavia and the Baltic region. Some regions in eastern Germany and the Ruhr-valley area, in northern France as well as remote alpine RURs in Austria also show also a decline, while RURs in Poland frequently demonstrate positive trends. Core cities mostly show similar trends as the non-urban surroundings, but with certain exceptions. For example, some RUR centres in coastal France, the UK and Ireland, in Germany's heavy industry area and in Poland show a decline, whereas the surroundings demonstrate growth trends. In contrast, growth trends can be noted for some RUR centres in Greece, Romania, Bulgaria, (eastern) Germany, central France and Finland, while the surroundings show a decline.

*Wolfgang Loibl, Klaus Steinnocher and Mario Köstl, Austrian Research Centers, ARC systems research*

Morphology type	Explanation
1. Monocentric	Regions with core city area without notable peri-urban sub-centres, three sub-types by core city size: very large (+metropolitan), large, medium
2. Urban polycentric	Regions with core city(or cities) and peri-urban sub-centres
3. Dispersed polycentric	Regions with several (medium-sized) peri-urban centres
4. Rural	rural regions without notable centres but dispersed smaller settlements

# Commuting patterns in Rural-Urban Regions

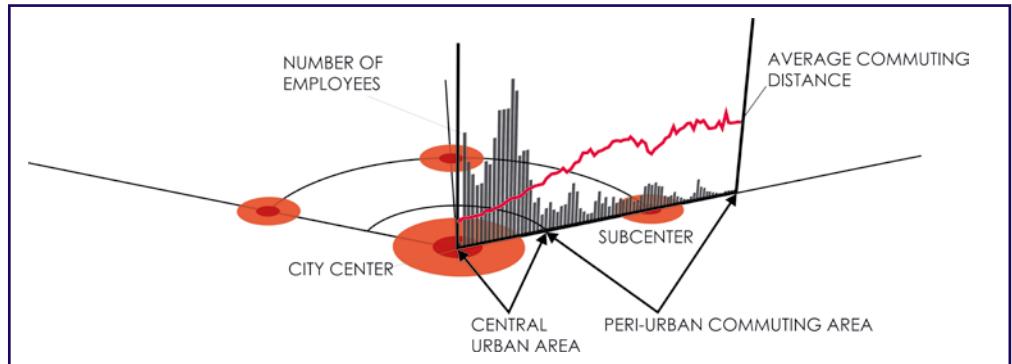
**Commuting is the most important single factor that determines daily travel patterns. Commuting intensity and patterns are very much depending on the distribution of workplaces, housing and transport systems. Urban sprawl tends to enlarge the functional regions of commuting and the zone of the automobile dependency. Will increasing distances be conducted daily also in the future or will new technologies emerge that could reduce daily travel demand?**

## Urban structure and commuting

Spatial decentralisation leads to suburbanisation and dispersion of both employees and workplaces. Urban sprawl and decentralisation of employees and workplaces are consequences of changes in accessibility through car availability and transport supply. Distance between home and work reflects the long term location choices made by households. This variable takes into account factors such as housing prices, transport facilities and the like. Commuting distance reflects the spatial interaction between labour force and housing markets – an interaction that generates traffic to the transport system.

Decentralisation and dispersion processes have an effect on commuting behaviour. Traditional compact cities are evolving into large urban areas. The flow patterns that have traditionally been oriented towards central areas are changing into criss-cross patterns. It is not clear, however, how polycentric metropolitan structures affect travel behaviour. Some authors suggest that a de-concentrated structure means reduced commuting distances and times, while others state that polycentricity implies an increase in commuting distance, as commuting distances are significantly longer in the suburbs than in the central area.

Transport in rural-urban regions is one of the major drivers in the context of climate change and greenhouse gas emissions. Reducing climate effects of transport means basically either reducing the



*Model of commuting distance, population density and distance to the centre in an urban structure. The graph is based on data from the Helsinki commuting region.*

vehicle kilometres travelled or developing more sustainable transport systems.

## Commuting research in PLUREL

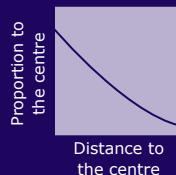
In PLUREL we concentrate on the linkages between commuting and urban structure. Structural factors serve as a framework for individuals within which they choose their transport mode. For example, if an individual lives in an area which is car dependent, and the distance

to the destination is long enough, he or she is not likely to choose public transport or walking as mode of transportation.

One task in PLUREL is to develop a model for the consequence of land use change for transport and commuting that can be applied to all European regions, based on available datasets. In this work, we have been focusing on commuting, since it is a mode of transport that deter-

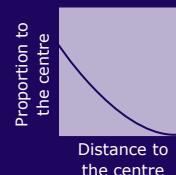
*Illustration of the logit model curve, depicting the probability of commuting to the centre in different kinds of urban structures. »Proportion to the centre« refers to proportion of the resident employed population (night population) travelling to a place of work in the city centre.*

- Very large monocentric**
- Workplaces in the centre
  - Large central area
  - Large commuting area
  - Fast transport systems



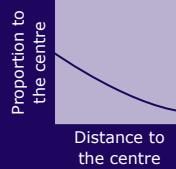
## Medium monocentric

- Dense
- Workplaces in the centre



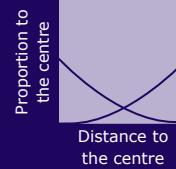
## Sprawled structure

- Sub-urbanisation of workplaces
- No adjacent centres with intersecting commuting areas
- Fast transport systems



## Polycentric

- Sub-urbanisation of workplaces
- Adjacent centres with intersecting commuting areas
- Multi-nuclei structure



mines the need of transport infrastructure. Peak-hour commuting travels cause most congestion, whereas leisure travel is often more multidirectional.

### **Commuting response function and a logit model**

In a monocentric city the key feature that determines the commuting kilometres travelled is the residents' distance from the city centre. This is confirmed by literature as well as by Finnish data sets and empirical analyses of data from other European cities. The schematic model drawing of commuting distance, population density and distance to the centre in an urban structure can serve as illustration. The so-called urban density gradient can be used to analyse how average commuting distance reacts to changes in distance to centre and density.

A natural approach in constructing the response function is to take the distance from the city centre as the main variable. Based on observed data we have developed a so-called logit model, a way of describing the probability of an outcome or choice based on certain predictor variables. Our model can be used to estimate the average commuting kilometres travelled for people living at different distances from the centre. This monocentric model is calibrated for different city region structures, taking into consideration the RUR (rural-urban region) typology and the morphology of the city region (see also the first article in this issue of PLUREL News), as well as the available transport system (e.g. rail or passenger car). The challenge is to adapt the model to polycentric urban structures where commuting is more multidirectional.

### **Future patterns**

The challenging part of the work is to extend the results of today's transportation patterns to future conditions. With help of the scenarios produced in PLUREL and by using spatial allocation rules (future urban structure), we seek to find the future distribution of housing and workplaces. Moreover, we want to use the response function and the logit model to predict future transport needs. One very interesting factor is the effect of new technologies (like teleworking) on commuting and urban structure.

*Mika Ristimäki, Ville Helminen and Panu Kontio, SYKE, Finland*

# **The power of the public sector to influence land-use changes**



PHOTOS: IVAN TOSICKS

**Within the large PLUREL network, the Metropolitan Research Institute (Budapest) and University Thessaly are the institutions dealing with the question of how the public sector can influence land use changes. Governance aspects and planning policies are the focus of their analysis.**

PLUREL intends to develop a model on the NUTS3 level for all European Union and European Free Trade Association (EFTA) countries. The difficult question is how to incorporate »qualitative« issues related to governance and planning powers into a quantitative model aimed at forecasting land use change for the whole of Europe. The model will estimate the magnitude of the push for more urban land use on the basis of economic, social, and demographic variables. This magnitude will differ according to the four scenarios chosen. Final decisions on land use changes, however, are taken across Europe by the public sector. The task is to estimate the willingness and the ability of the public sector to resist the push from market actors (the population, investors etc.) towards expanding urban land use in ever more dispersed locations.

### **Factors influencing public sector decisions**

The decisions of the public sector depend on many factors. In a Europe-wide model, we can only take into account the two most general, nation-wide issues: the structure of government and the type of regional/spatial planning policy.

The ability factor of public decisions to resist urban sprawl is modelled by the fragmentation of government levels (their relative size compared to the rural-urban regions (RURs)), and the relative power of the different levels in deciding on land use change. The latter is based on indices such as elected/delegated/appointed decision-making body, presence of physical or strategic planning, and so forth. According to our hypothesis the closer the administrative level deciding on land-use changes is in size to the RUR, the more power it has to influence land use changes for that region.

The willingness factor of public decisions is modelled by an assessment of planning styles on regional or national level. This can range from non-interventionist, laissez-faire systems, where local govern-

Type of regional/spatial planning policy			
Degree of fragmentation in land-use change decisions	a) Non-interventionist, laissez-faire systems	b) Medium level of control	c) Strong, controlled spatial policies
A. Very fragmented	1	2	3-5
B. Partly fragmented	2	3	4-5
C. Consolidated	3-5	4-5	5

*The numbers reflect the ability of the public sector to resist the push of the market, ranging from 1 (minimum) to 5 (maximum).*

ments have total freedom to take their land use change decisions, to controlled systems where land-use changes have to be in accordance with higher level plans and/or pre-set conditions. Here the hypothesis is that stronger regional/spatial policies aim at minimising the sprawl of urban land use. This is done through concentrating development either on already used (e.g. brownfield) areas or into compact areas of new development, usually with good public transport links. Furthermore an index representing the presence of corruption in the given country can play a role, estimating the possible influence of the investors on the decision-makers.

#### **Interactions between ability and willingness**

These two factors, the ability (formal government system) and willingness (the planning power) are not completely independent from one another. On the one hand, a strong regional planning policy can substitute for the missing consolidation of the local government structure. This is the case in France, for example, with the »communauté urbaine«, the compulsory planning cooperation between the fragmented local municipalities. On the other hand, consolidation of fragmented local governments can substitute for the absence of a regional planning policy. In some European countries, the many, previously independent settlements are replaced by larger, consolidated local governments which can make area-wide decisions. The interference of the two factors, i.e. their joint effect, can be hypothesized as illustrated on page 5. The values in the table are presently only tentative and aim to reflect the ability/power of the public sector to resist the push of market actors towards more urban sprawl, ranging from minimum (1) to maximum (5). These values will be included in the PLUREL model as a layer. The value of the strength of public regulation over land use change has to be determined for each NUTS2 region, for all countries. These figures will be determined on the basis of national-level information about formal government systems and regional/spatial planning policies.

*Iván Tosics and Antal Gertheis,  
Metropolitan Research Institute,  
Budapest*

*Kostas Lalenis, University Thessaly,  
Greece*

# **Evocative event: Lounge workshop on landscape**



PHOTO: JURGEN BREDE AND AD KOOLEN

**PLUREL wants to present its results not only to scientists. Also politicians, practitioners and the general public should be involved. That is the reason why evocative events are part of the project's dissemination strategy. Regional exhibitions, debates, workshops and events are used to catch people's attention on the results of the project and to put its issue of sustainable peri-urban land use in metropolitan areas on the public agenda. This article describes a recent example of such an evocative event.**

An international PLUREL lounge workshop held as part of the International Triennial of Landscape Architecture in Apeldoorn, The Netherlands, can be considered as the first public event within PLUREL. During the general PLUREL meeting in September 2008 in Haaglanden an exhibition including debates and workshops is organised in the Stroom gallery on Architecture and Art in The Hague. In other countries similar initiatives are planned.

#### **PLUREL lounge**

Sitting comfortably in armchairs and on sofas with a beer, international participants at the conference »A wider view« in Kootwijk discussed issues of landscape and urbanisation in Europe in a lounge

workshop on Monday June 16th, 2008. The »European living room« where the workshop takes place is divided into Polish, English, Dutch and French corners. The Landscape and Urbanisation workshop was organised by Ad Koolen and Wim Timmermans (Van Hall Larenstein, Wageningen UR). That morning they had a truckload of used furniture delivered from a second-hand shop to give the workshop a homely atmosphere.

In the Polish corner, Paulina Jurgiel and Agnieszka Sulenta, both studying spatial management at the University of Warsaw, explain their plan to conserve a green area with forests just outside the capital. »Buildings, housing, roads and traffic are all encroaching on this area«. The first step is to educate the inhabitants, the Polish students explain. The workshop participants try to establish exactly what the problems are in the Warsaw case. The different municipalities involved have no common strategy and almost no limits are placed on investors. A participant from Bulgaria recognises the problems: »In Sofia there are plans, but they are not implemented.« Some of the Dutch participants explain how things work in The Netherlands, referring to the well established regulations that exist. The Polish students are especially interested in all the bicycles they've seen in Holland as a means of transport.

# and urbanisation

## Better legislation and more communication

The lounge guests rotate regularly, so that everyone has a chance to hear and discuss all the projects. In the English corner, Joe Ravetz, co-director of the Centre for Urban Ecology at the University of Manchester, is a bit cynical about developments on the peri-urban fringe of many UK cities. Rich people are moving to the countryside close to the city and this is driving away the poorer inhabitants. Furthermore, these poor inhabitants have no lines of communication with the decision makers.

The French landscape designer Jennifer Buyck describes a prize-winning project in Montpellier, where spatial planning guidelines have been laid down for the agglomeration around the city. The area spans the mountains and villages nearby, the city itself and the seaside. »The municipalities don't always respect the agglomeration, which is a relatively new administrative level in France. There is no jurisdiction, so it is difficult to enforce the guidelines,« Buyck explains. Two Turkish planners recognise the problems associated with a lack of legislation. In Montpellier the planners are trying to work together with the people who live and work in the area. »Much discussion ends up being at the individual level: residents are unhappy with something being placed in front of their house or garden. It's difficult to discuss the project as a whole,« says Buyck. Because there are large areas of nature in southern France, people don't value green in the urban setting, although Buyck says that this attitude is starting to change.

At the end of the workshop, the guests come up with recommendations for the projects. Not surprisingly, the common factor turns out to be communication with the inhabitants and getting them involved.

*Alexandra Branderhorst, journalist,  
The Netherlands  
(Previously published in »Resource«  
no. 35, 19 June 2008)*

# PLUREL People

*Interview with Marcel Houtzager, regional portfolio holder, The Hague Region (the governing body »Stadsgewest Haaglanden«), The Netherlands*

## How are you involved in the PLUREL project?

As the policy maker for green areas, recreation and tourism in the governing body The Hague Region in The Netherlands, I am responsible for urban-rural relationships in our region. The Hague Region is one of the six European case study regions that participate in PLUREL. I represent the policy makers of these regions in PLUREL's Board of Stakeholders, with the task to maintain a sound dialogue between us policy makers and researchers. Moreover, research within PLUREL should lead to results such as scenarios and models targeted towards the regions and their needs. The recommendations of the Board are often followed, leading to more applicable results.

## What are your expectations from the project? How can your region benefit from PLUREL?

I expect that the project will deliver practical tools which will help us plan and manage our region in a sustainable way. Tools should assist us in finding a balance between different spatial claims, ensuring preservation of sufficient open, green and historically valuable landscapes. PLUREL offers insight into the experiences and views of other European regions concerning urban-rural relations, models of land use and strategies to maintain sufficient green space and open landscape. But we also need to keep our region economically dynamic and create opportunities for new functions. Valuable elements of PLUREL are the exchange of experiences and knowledge and the opportunities to work towards a better balance in our regions together with researchers, planners and other specialists.

## What is your view on the collaboration between scientists and policy makers in the project?

This collaboration is important for keeping the research politically relevant and applicable. Moreover, it offers the opportunity for exchanging views between science and policy. Policy makers will obtain insight in future trends and factors that can influence their regions. In this way we gain a better understanding of the impact of today's decisions on future spatial, economic and social developments in the regions. In this respect the models, scenarios and tailor-made policy recommendations developed for our region are of importance.

## Which challenges can stand in the way of PLUREL's success?

Ensuring the applicability of the project's end results and their relevance to the work of practitioners and policy makers is a continuous challenge. Researchers need to keep working closely together with the case study regions and the Board of Stakeholders. That is the recipe for a successful project, producing practical end products for decision makers in Brussels or on the local, regional and national level.



PHOTO: SICCO VAN GRIEKEN

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- Queen's University Belfast, United Kingdom
- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France
- University of Edinburgh, United Kingdom
- Van Hall Larenstein, The Netherlands

## **Peri-urban Land Use Relationships**

*Strategies and Sustainability Assessment Tools  
for Urban-rural Linkages*

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PHOTO: THOMAS SICK NIELSEN

## Peri-urban transition processes

**The increasing variety of urban-rural relationships in peri-urban areas challenges policy makers, who often are not well equipped to deal with this complexity. To improve the ability of policy makers, a fundamentally different perspective is suggested, namely that of change and development within the peri-urban as non-linear transitions.**

The PLUREL project provides the opportunity to analyse development processes within different case study regions. Questions can be addressed such as: how do regions deal with transition processes? can general trends of development be identified? and does the combination of a theoretical concept of transition and PLUREL case regions provide new insights which could contrib-

ute to introduction of alternative spatial strategies?

### **The concept of transition**

Peri-urban areas are often dynamic zones not yet restrained by sub-urban or inner-city planning and legislation. They comprise an unbalanced mixture of urban and rural functions. Peri-urban areas are multifunctional and interrelated

zones with potential for change. Flows of people, goods and communication in these regions are connected directly with each other, often bypassing the core city. Therefore, we can consider the peri-urban as a complex system, which develops in a non-linear way. The concept of »transition« can help us obtain an enhanced understanding of these non-linear developments. Moreover, it could contribute to a new perspective leading to planning strategies that are able to deal with non-linear processes.

In their article from 2001, Rotmans and colleagues define a transition as a »gradual, continuous process of structural change within a society or culture«. A transition is a change of the »core« of the system and its development can vary in speed, length and scope. Non-linear developments, represented by transitions (see graph c in the figure below), fundamentally change between stages of relative stability. Contrary to linear and exponential developments (visualised in graphs a and b in the same figure), both structure and function can change during a transition, partially induced by a changeable context and causality.

A transition can be characterised as a multidimensional, multilevel, qualitative and irreversible process. A trigger for a transition could for example be a changing role of the state or the dominant ideology which guides state action. Triggers could also be changes in the economic importance of natural resources, the availability of new technology, or a shift in the balance of society. Due to the changeable context and multiple inter-

*Visualisations of (a) linear development; (b) exponential development; and (c) non-linear development. Within (c) both structure and function change. (Based on the presentation by De Roo at the PLUREL congress in The Hague, 2008)*

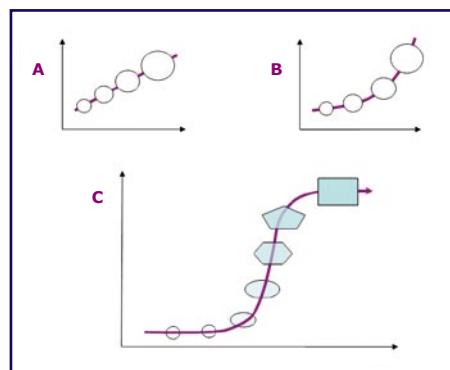


PHOTO: MARC BEEFTINK

related autonomous processes which could be generators for change, various directions for development are possible. Within a transition process several phases can be distinguished, such as pre-development, take-off, tipping period, acceleration and stabilisation. Within these phases a dynamic equilibrium of stable and dynamic elements shifts, resulting in either innovation or decline.

#### Multilayered perspective

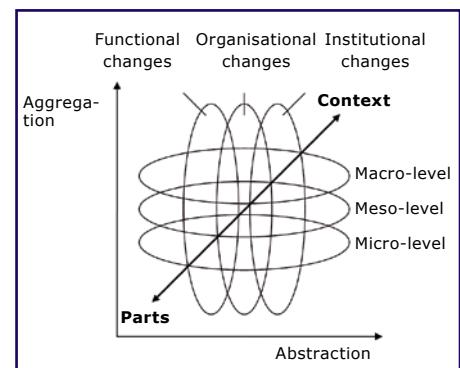
Urban-rural interactions can be considered as multi-level processes. At the micro-level, events can trigger the transition process, connecting with meso-changes influencing the peri-urban area as a whole. Meanwhile, contextual changes occur at macro-level. These contextual changes could very well be regarded as a first call of dawning new spatial concepts. The meso-level will try to connect with these concepts and macro-trends. However, the meso-level can become conservative and rigid. It is hard to stay flexible and renew, while dominant actors in the system try to hold on to power and profits. Meanwhile, developments at micro-level are more likely to link successfully to transition processes. Here, innovations and experiments evolve more easily, as the micro-level is less rigid.

In order to understand potential for change in the peri-urban, in a forthcom-

ing paper Hudalah & De Roo suggest to consider rural-urban transition as a multi-layered process with three dimensions: functional, organisational and institutional at the macro-, meso- and micro-level.

Functional changes are ranging from physical changes (such as land use and infrastructural changes) and urban and regional dynamics (for example, population, economy and employment changes), to catastrophic events (such as war and disasters). Organisational changes concern changes of actions, cooperation and coordination influencing stakeholders/actors. They consist of economic actors (including real estate developers), political actors and governments, and non-

#### Multilayered changes in rural-urban transitions.



governmental actors such as environmental organisations. Finally, institutional changes comprise altering frameworks of meaning and rules of conduct. They consist of shifts in cultural values, formal and informal rules (including new legislations and policy frameworks), and ideological forces.

### **The Montpellier region as example**

Since the start of the PLUREL project, various urban regions – Haaglanden, Leipzig, Warsaw, etc. – have been analysed. These cases provide insight into non-linear transitions within the peri-urban. Here we present the peri-urban area of Montpellier, France, in order to elaborate upon the concept of transition as providing a useful perspective to our understanding of peri-urban developments.

Since the 1960s, the peri-urban area of Montpellier has been changing towards a multifunctional area with integrated urban-rural relationships. Economic and demographic changes are dominant in the area's transition processes. Five phases can be distinguished in the development of the Montpellier region. In the pre-development phase (1945-1962), the mono-economy of the wine industry declined. Meanwhile, technological innovation and tourism were generators of economical development elsewhere in Europe. These emerging autonomous and contextual macro-processes could be considered as possible future drivers for a transition.

The wine crisis and the strong demographic growth of the region in the 1960s resulted in a take-off (1962-1977) of a transition of the peri-urban. Due to urban expansion and the introduction of new economical sectors, urban and rural development strategies came under pressure to adapt. The institutional framework was not suitable to deal with upcoming spatial trends. Consequently, urban expansion in the peri-urban zone was not embedded in spatial strategies. Besides, old structures came under pressure, such as the wine industry, and new forerunners appeared, for example the settlement of computer giant IBM.

This adaptation occurred during the tipping period (1977-1982) with the installation of a new city council and decentralisation of spatial policy. The development of the urban fringe became demand-oriented. Public actors ac-



PHOTO: MARC BEEFTINK

knowledged the drivers of a fundamental change and started to accommodate new peri-urban developments, resulting in the acceleration phase (1982-2001) of peri-urban transition. The service sector, the high-tech industry and the leisure economy experienced a strong development and urban extension occurred due to the increasing attractiveness of living in the peri-urban. Recently, a period of stabilisation has emerged. Institutional and organisational dimensions of spatial development are adapting to the integrated urban-rural relationships they face. The establishment of the Montpellier agglomeration, the regional tramlines and the introduction of a regional spatial development strategy provide examples of this adaptation process and the striving for a more coherent development.

### **Implication for spatial strategies**

Within the development of the peri-urban area of Montpellier, which has had different dynamics over time, non-linearity is an important characteristic. Therefore, controlling spatial developments might be unrealistic. Instead, transition processes take place in a dynamic period and are driven by interlinked (partly autonomous) processes of which some might extend beyond the scope of management. Consequently, transitions cannot be managed solely through traditional planning strategies. From a transition perspective,

peri-urban areas should have an adaptive capacity, a »readiness for change«. This could increase the systems probability of making advantage of transition processes. Therefore, functional, organisational and institutional factors should be multifunctional and flexible. Also, a sustainable spatial structure is needed to reinforce the base for future development. »The fitness of the system« to adapt to, and to accommodate change in, a sustainable way are considered to be equally important. Therefore, balancing dynamic and robust elements of the system will be required. Cohesion and compatibility could be considered as conditional for a sustainable spatial structure with synergy and a coherent identity.

Although some general and rather abstract key aspects of transition management are mentioned here, the scenario and modelling approaches within PLUREL could be essential for identifying new pathways of development. Furthermore, alternative approaches to deal with non-linear processes at local and regional scale will be presented during months to come.

*Ward Rauws & Gert de Roo, University of Groningen and  
Wim Timmermans, Wageningen UR / Van Hall Larenstein*

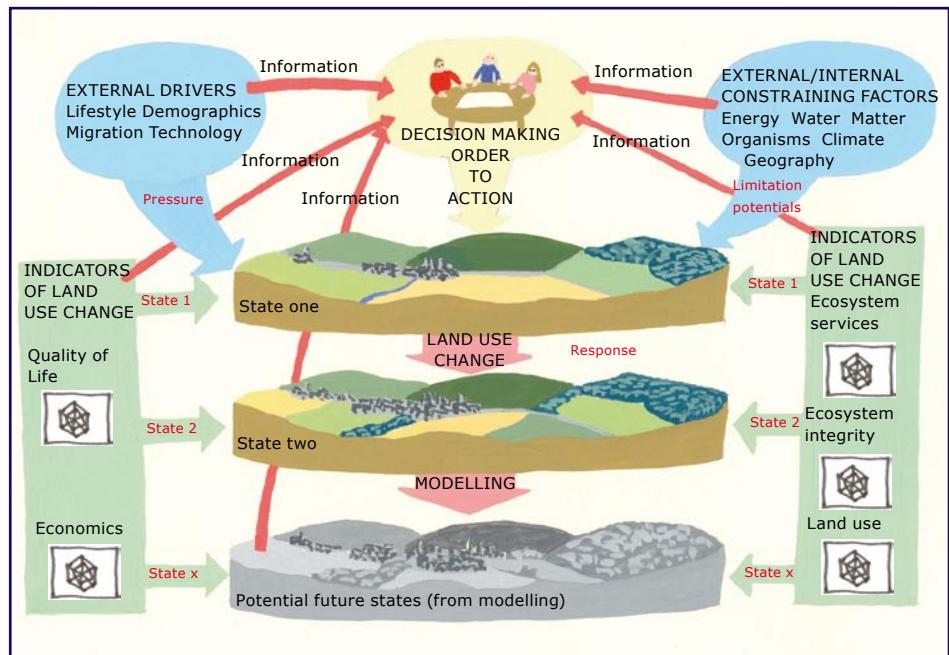
# Indicators of land use change over rural-urban gradients

**When land uses change, at greater or lesser scales but especially at the interface between the urban and rural, a variety of effects occur which may change a number of environmental, social and economic factors for the better or worse. One way to try to capture these effects, such as the changes in air quality, in commuting patterns, in hydrological function, wildlife habitat quality or the quality of life, is through the use of indicators.**

Indicators, as their name suggests, indicate the direction and strength of change in these factors and provide an overall picture of how land use changes affect them over time. In the case of land use change occurring at the scale of a rural urban region, it is helpful to look right across the gradient of land use density from the inner city to the rural hinterland. It is especially important to focus on the urban-rural interface at the urban fringe where land use changes are at their most dynamic. Thus it is necessary to define and describe such gradients. This can be done statistically, looking at a range of factors such as building density which declines outwards from a centre, or population density which shows a similar pattern. Work like this is complicated by the morphology of city regions – large mono-centric cities such as Warsaw show clearer gradients than polycentric metropolitan regions such as Manchester.

## The DPSIR model

Central to the concept of indicators is how these are applied in terms of the cycle of land use change cause and effect exemplified by the DPSIR model (Drivers, Pressures, State, Impacts and Responses). Thus, some drivers of change, such as population growth or decline, need indicators developed from demographic trends. However, these are difficult to resolve spatially at the level of districts within a rural-urban region. Pressure indicators can be derived from response functions which translate fac-



tors such as migration – also a cause of population change – to specific areas of a rural urban region or to particular land use changes such as urban densification or rural abandonment. State changes are expressed through indicators representing landscape integrity, such as biodiversity, nutrient and energy flows in ecosystems or landscape heterogeneity. Impact indicators describe the effect of the changes of land use such as soil loss, hydrological changes or accessibility to green space, all of which can be measured using monitoring or other data resolved spatially at greater or lesser degrees of scale. These data can also be shown using graphs and other means which demonstrate the changes across the rural-urban gradient. Response indicators show how municipalities and other agents reacted to the impacts and these feed back into the DPSIR cycle, affecting the drivers once more.

## Indicators in scenario development and modelling

Past and present data can be used to calibrate the indicator sets and to show how past land use changes leading up to the present have affected ecosystem services or quality of life. These can then be

applied with some confidence to possible future scenarios of land use change. Scenarios are possible futures derived from analysis of different trends affecting societies and may include accelerating or decelerating rates of urban change. Another approach is to undertake some modelling using rule sets derived from a number of driving forces and then to model future land use patterns produced stochastically as land use types switch from one to another according to these rules. Agriculture can e.g. switch to urban or forest, while urban tends not to switch to forest. The indicators are then used to explore the impacts of such modelled futures and to help policy makers to decide which strategies for development of a given region are likely to have the least impact in key areas. Indicators therefore need to be presented in simple graphical ways that are easy to interpret. The use of diagrams such as »spider webs« is one way of doing this, showing the extent to which factors along different axes change to greater or lesser degrees for each potential future scenario.

Simon Bell, Edinburgh College of Art  
and Felix Müller, Christian-Albrechts-  
University of Kiel

# MOLAND Model results for the Leipzig region

**One of PLUREL's aims is to analyse and understand urban and peri-urban relationships by means of land use scenario simulations to support strategic planning. In PLUREL's Leipzig region case, the MOLAND Model has been combined with local stakeholder knowledge for developing regional development storylines.**

The approach used is application of the cellular-automata based MOLAND Model, driven by information derived from the agent-based model RESMOBcity and from the expert-knowledge of local stakeholders. Urban planners, regional policy makers and scientists distilled the main variables for the future development of the region and assembled those to consistent storylines which were then ingested into the modelling framework.

## Modelling land use categories

The land use patterns of the Leipzig area were classified in the MOLAND Model into 20 categories. Five of these are active land use functions (continuous

urban fabric, discontinuous urban fabric, industrial and commercial, construction sites, port areas), while eight are vacant land uses where urban expansion actually takes place.

The final seven categories are land use features (airports, mineral extraction, dump sites, road and rail networks, artificial non-agricultural, water bodies) that remain stable during the modelling process. Input variables in the model were: past and actual land use maps, accessibility of transport network, inherent suitability for different land uses, zoning status or institutional suitability and socio-economic characteristics (e.g. population, income, production, employment). The spatial resolution is 100 x 100 meters. Model calibration, performed with historical data sets over the period 1990-2000, provided accuracy values above 90% for most of the active land use classes.

## Example of results

As shown in the table, qualitative scenarios were produced for a period of 25

Locally adapted scenarios	No restrictions	Planning instruments implem.	Strong planning
<b>Growth</b>	»Hyper-tech« scattered growth		Smart growth
<b>Baseline</b>		»Business as usual« Baseline	»Eco-environmental« Compact eco
<b>Decline</b>	Give-up shrinkage		Smart decline

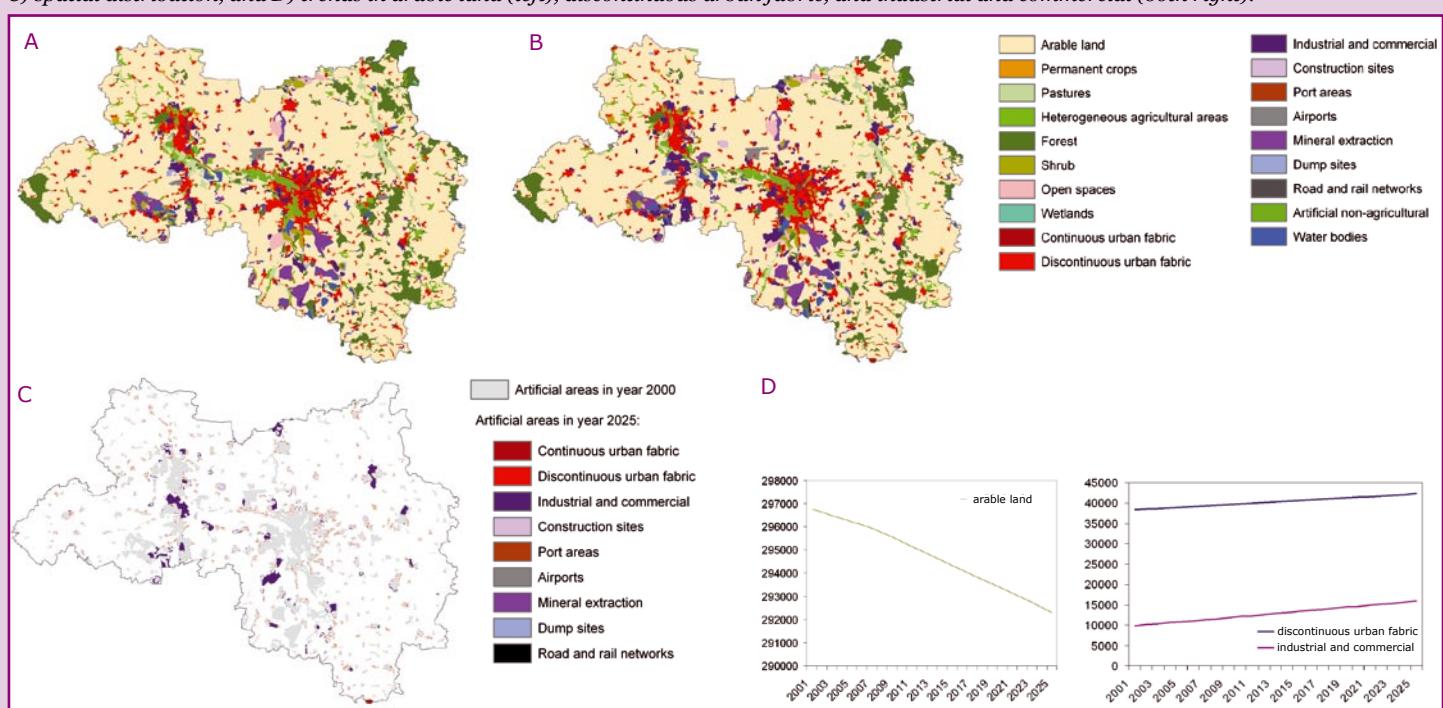
*Expert-based future development scenarios for the case study region of Leipzig. The scenarios have been then translated into quantitative drivers for the MOLAND Model.*

years (2000-2025) following the overall PLUREL storylines and with the involvement of local experts. Preliminary results are available for the business-as-usual scenario for 2000-2025 (see figure). According to the simulated projections, the growth of artificial areas is expected to continue in the Leipzig region, regardless of the further decline of population and related ageing. In particular, discontinuous urban fabrics are increasing with 10 % and industrial and commercial areas with over 60 %. These new developments will claim open land in the urban periphery, and particularly arable land, natural succession areas and shrub vegetation, which all are expected to decrease.

*Laura Petrov<sup>1</sup>, Dagmar Haase<sup>2</sup>, Carlo Lavalle<sup>1</sup>*

<sup>1</sup>EC-DG Joint Research Centre-IES, <sup>2</sup> Helmholtz Centre for Environmental Research - UFZ

*Preliminary results for the business-as-usual scenario for the region of Leipzig. A) landuse for year 2000 (actual), B) land use for 2025 (simulated), C) spatial distribution, and D) trends in arable land (left), discontinuous urban fabric, and industrial and commercial (both right).*



# Towards sustainable land use planning – the Koper case



PHOTO: HORST THALLER

**The municipality of Koper, situated on the Slovenian coast, is one of PLUREL's case studies. A highly diversified peri-urban land use and increasing development pressures call for tools that support sustainable land use planning.**

The municipality of Koper lies between Italy and Croatia. Koper is situated in the southwest of the country. Its total area is 311 square km, with 17.6 km of coastline. The municipal territory includes more than one hundred settlements and had a population of 49,303 in 2007. The municipality is characterised by a Mediterranean climate, with long and hot summers, mild winters and occasional strong winds. The administrative centre of the municipality is the town of Koper (about 24,000 inhabitants). Here, most of the administrative, economic and cultural activities are concentrated.

## Brief history

Koper's history spans over more than 2,000 years. Initially it was not more than a humble island settlement within city walls, where the vicinity's inhabitants took refuge at the time of the great migrations. In the following centuries, though, Koper flourished, mainly because of its favourable position. Its economic power lasted until the 18th century, when Rieka and Trieste were granted the status of free ports. With the downfall of the Venetian Republic and the completion of the Vienna-Trieste railway, Koper finally lost its important role in the wider region. After the Second World War, Koper flourished once again, becoming the most important economic centre of the Slovenian coast.

With Slovenian independence in 1991, Koper became the only commercial port and an important industrial centre of Slovenia. Today the city is the sixth larg-

est town in Slovenia and second in terms of per capita GDP. The basic advantages of its economy are diversity and versatility. In addition to tourism, crafts, industry, entrepreneurship, transport, trade, business and financial services are the most important activities. The Port of Koper, founded in 1957, continues to be a very important actor, with a major economic and spatial influence on the town and its surroundings, and even on the national economy.

## Diversified peri-urban land use

The location of the city on the coast and the medieval city centre provide some limitations for future development. In addition, the Port of Koper occupies a lot of space. Settlement and the development of economic activities are therefore directed even more into the peri-urban area, which also experiences the highest pressure concerning future construction

*The aerial photos show Koper in 1911 (left), 1960 (middle) and today (right). Source: Surveying and Mapping Authority of the Republik of Slovenia.*



and other interventions. The peri-urban area is characterised by highly diversified land use. It acts as a built-up area for settlement, as well as a green and recreational area. Favourable conditions enable agricultural activities, while new infrastructure and industrial zones are also being constructed there. A major part of the municipality is formed by the rural hinterland, which is sparsely settled but has unique cultural and natural heritage values and a rich biodiversity.

#### **Strategy for sustainable land use**

The municipality of Koper is currently preparing new spatial documents. The strategic issues that dominate planning discussions in the municipality are manifold. They include the adjustment of different development needs and assurance of spatial efficiency in the sense of rational space arrangement and protection of natural resources (best agricultural land, forests etc.). Other issues central to the planning discourse are assurance of high quality living conditions (green and recreational areas), efficient public transportation, conditions for economic development (industrial and trade zones), and maintenance of the cultural landscape and natural and cultural heritage in urban and rural parts of the municipality.

PLUREL is contributing to the planning discourse. With the aim of including the issue of sustainable land use in Koper's new municipality spatial plan, an informal »Sustainable Land Use Strategy for the Municipality of Koper« was drafted and accepted at a workshop involving stakeholders and researchers.

The aim of the new strategy is to promote more optimal and more sustainable land use, taking into account the aspects of natural resources (soil quality, environmental important areas, important forest areas, etc.), the initiatives of local people and other actors and future development/spatial needs. Digitalised maps with various contents and a final integrated map, planned to be developed through PLUREL's research activities, will provide a tool to spatial planners. This tool will help planners prepare a proposal for the municipality spatial plan which will be supported by professional arguments and result from an inter-sectoral approach to planning.

*Anton Perpar, Andrej Udovč and Marina Pintar, University of Ljubljana*

# PLUREL People

*Interview with Marina Pintar, University of Ljubljana, Slovenia*

#### **What is your role in PLUREL?**

I am involved in Module 3 as a researcher in the Koper case study, which is one of seven case studies in the PLUREL project. In addition to doing my own research, I coordinate the work of the University of Ljubljana research group involved in PLUREL on the one hand, and the activities of local stakeholders from Koper municipality and local small and medium-sized enterprises on the other.

I closely collaborate with the coordinator of Module 3. This module aims to develop different scenarios for urban development in an inclusive way. Since spring 2008, since the PLUREL meeting in Warsaw, I have also been involved in the project's Indicator Task Force.

#### **How will PLUREL benefit from your specific expertise?**

The field of work of the local research group for the Koper case study comprises agronomy and forestry, and specifically agricultural and forest land use, including nature protection areas. In Slovenia, and Koper is not an exception, we have a huge problem with different pressures on agricultural land, and especially with urbanisation.

The old (and still existing) system of protecting agricultural land in Slovenia as one of the natural resources is not efficient. Together with local stakeholders, we have developed a new strategy for agricultural land protection. This strategy could be implemented as part of the planning system. Discussing this 'Sustainable Land Use Strategy' developed for Koper within PLUREL could be of interest to some of the project's other case studies.

#### **What will be PLUREL's most important results?**

Due to size of PLUREL and its research team, there will be a wide range of high-value results relevant to research in a broad sense, as well as to practitioners and policy makers. From a more local



PHOTO: DARINKA SEBENIK

point of view, the development of the aforementioned Sustainable Land Use Strategy for Koper will be very important for us. The results of the MOLAND Model will also be of great benefit to Koper municipality. Moreover, the value of the many new relationships and collaborations resulting from the PLUREL project should not be underestimated.

#### **Which challenges can stand in the way of PLUREL's success?**

At the beginning of the project, overcoming the boundaries between research disciplines appeared to be a huge challenge. Time was also needed for starting up fruitful communication with stakeholders. Now that we are in the second half of the project, these challenges are behind us and we can be very optimistic about PLUREL's eventual success.

#### **Why should policy-makers be interested in PLUREL?**

PLUREL should be of high interest to policy makers primarily as the project deals with planning processes which influence, directly or indirectly, everybody's life. Policy makers are the people who steer these planning processes. Having said this, not only policy-makers should be interested in PLUREL, but also many other actors.

# PLUREL



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PHOTO: KJELL NILSSON

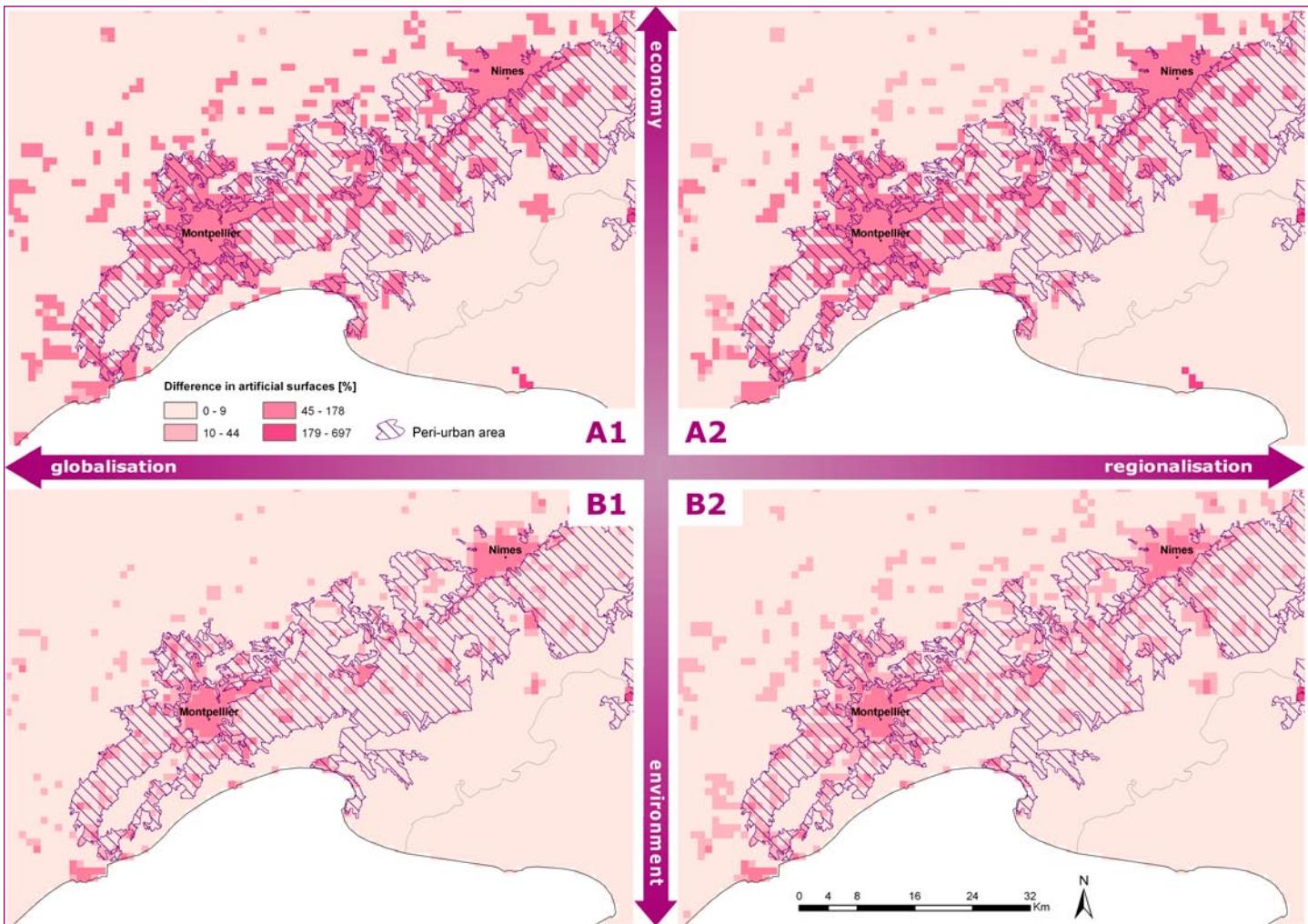
# Where will Europeans live in the future?

**Scenarios of the location of built-up areas can help us to understand how people might change European landscapes in the future. Although there are big differences in built-up areas between countries, trends in urban patterns emerge from different scenarios, including sprawl into**

## **peri-urban and rural areas or concentration in cities.**

Future land-use patterns in peri-urban areas, PLUREL's main focus, depend largely on changes in the density and location of artificial surfaces (CORINE land-cover level 1, class 1). But, where

will these changes occur? How can they be influenced by planning policy and household preferences? What is the role of technological development in the transport network? These are just some of the questions we address in a scenario analysis of urban land-use change using the regional urban growth model (RUG).



### **European-wide modelling: a challenge**

If a land-use model is to capture the location of changes, for instance in urban or peri-urban areas, it needs to operate at a reasonably fine resolution. However, this means that the data-sets for a continent-wide model can become extremely large. The RUG model, for example, runs on a 1-km geographic grid, which for 25 European countries (EU-27 minus Bulgaria and Cyprus) covers nearly 4.2 million pixels. The sheer quantity of data limits what can be achieved and how the model is designed with one solution to this problem being to run the model for each region (NUTS 2) in turn.

The main input to RUG is a projection of the quantity of artificial surfaces per NUTS 2 region for 2025. This is derived from projected population and GDP (Gross Domestic Product) per capita, both outputs of the NEMESIS model. To allocate these artificial surfaces within each region, the model also uses data such as travel times to the nearest cities (medium

or large), distance from the coast and the presence of flood risk zones.

Changes in built areas have been simulated for 2025 for the four PLUREL scenarios: A1 (hyper-tech), A2 (extreme water), B1 (peak oil) and B2 (fragmentation) (see PLUREL Newsletter No. 3, p. 1-3). The scenario storylines affect some of the input data directly. For example, future travel times will vary with the technological change associated with each scenario. Other factors such as the distance from the coast do not vary, but the scenarios determine the importance of coasts in influencing household location preferences. The scenarios also influence model parameters which are used to reflect alternative land-use planning strategies (e.g. »laissez faire« policy versus compact development).

### **Case study: projected changes around Montpellier**

The four scenarios differ in both the intensity and the patterns of change in artificial surfaces around Montpellier

*Difference in artificial surfaces, as a percentage of the current coverage, in the Montpellier region by 2025 for scenarios A1-hyper-tech, A2-extreme water, B1-peak oil and B2-fragmentation. The hatching shows the areas classed as peri-urban.*

(see the first figure). The A1-hyper-tech scenario has the highest overall increase in built areas due to high population and economic growth. Rapid technological change, which reduces the need for commuting, new transport technologies and few planning constraints lead to counter-urbanisation, that is, increased development in rural areas. In apparent contradiction to the scenario storyline, urban growth also remains quite high in city centres. This is probably due to the peri-urban and rural areas being unable to absorb all of the projected population increase.

Economic growth remains high in the A2-extreme water scenario, but population growth is moderate, leading to a slightly lower overall increase in artificial surfaces than in the hyper-tech world. The rural, hilly areas north and west of Montpel-

lier suffer the most from extreme events linked to water such as drought or landslides brought on by storms, which makes them less attractive to potential new residents. Increases in artificial surfaces are therefore found mostly in urban and peri-urban zones.

In the B1-peak oil scenario, both population and economic growth are lower, leading to a much smaller overall increase in artificial surfaces than in the hyper-tech or extreme water scenarios. However, the main driving force in this scenario is the oil price shock. High fuel costs and strict planning policies concentrate growth in the urban cores of cities. There is little increase in the peri-urban zone, even along the main transport axis between Montpellier and Nîmes, and next to none in the rural areas. The latter are strongly affected by the decline of the car-dependent tourism industry, as holiday-makers shift their preferences to locations accessible by public transport.

Finally, the B2-fragmentation scenario shows moderate population growth, but low economic growth, so the overall increase is slightly higher than in the peak oil scenario. The new artificial surfaces are more spread out than in the previous scenario, mainly in the peri-urban zone. This spread is not uniform but consists of a series of clustered communities of different age groups, ethnicities, etc. in and around the city core. There is also some increase in rural areas, with the formation of green enclaves as older native people move out of the socially and ethnically diverse cities.

#### **European perspective: common trends & national variability**

The trends observed for Montpellier are consistent with those found in the rest of Europe. The second figure, for example, shows the changes in the ratios of urban to peri-urban, and urban & peri-urban to rural artificial surfaces for all 25 Euro-

*Difference between future (2025) and current (2000) ratios of urban to peri-urban artificial surfaces ( $u/p$ , mauve boxes) for the 25 countries in the study area (EU-27 minus Bulgaria & Cyprus). The -purple boxes show the difference in the urban & peri-urban to rural ratio ( $(u+p)/r$ ). Both ratios are shown for the four scenarios: A1-hyper-tech, A2-extreme water, B1-peak oil and B2-fragmentation.*

pean countries in the RUG model. For the A1-hyper-tech scenario, there is little change and even a slight decline in the urban versus peri-urban ratio, while the urban & peri-urban to rural ratio shows a small increase. This shows that growth is fairly well distributed across the three zones, although peri-urban areas have slightly more growth than other areas. At the other end of the spectrum, the B1-peak oil scenario shows a strong increase in both the urban to peri-urban and urban & peri-urban to rural ratios, indicating a concentration of new artificial surfaces in city centres.

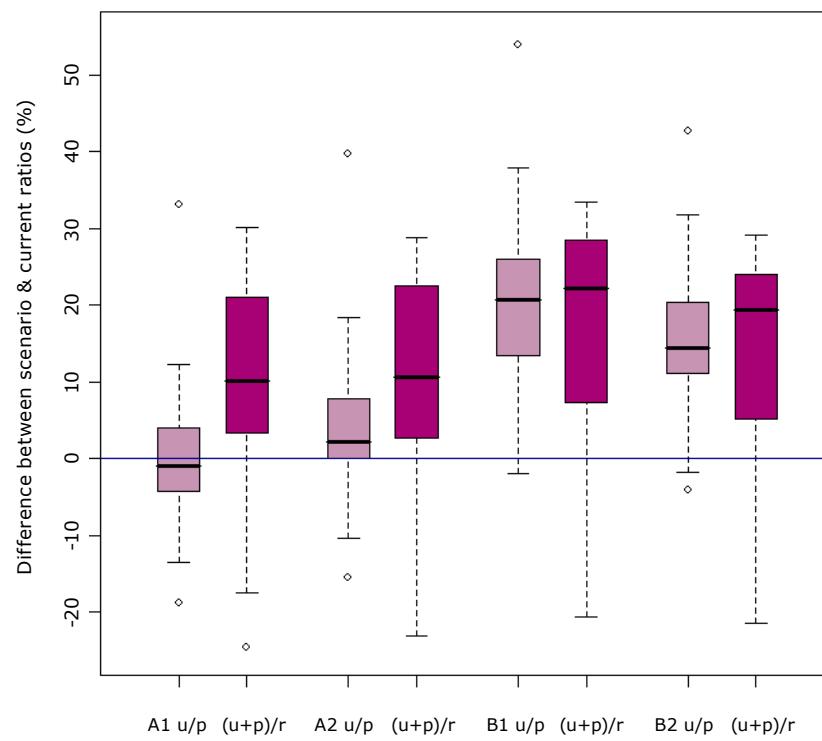
However, these general trends should be considered in the perspective of the large variability between the 25 countries: a few countries always show the opposite trend. For the urban to peri-urban ratio, Austria and Portugal show a decrease in most scenarios. For urban & peri-urban to rural, Portugal, the United Kingdom and Sweden have the strongest »opposite« trend. This may partly be due to the large differences which currently exist between European countries in the distribution of artificial surfaces across urban, peri-urban and rural areas, although there is no clear link with the current composition for each country. For instance, the United Kingdom has over 50 % of artificial surfaces in urban zones, whereas in Sweden nearly 70 % of artificial surfaces occur in

zones classed as rural. The UK also has 35 % of artificial surfaces in peri-urban zones, compared to less than 7 % for Sweden.

The differences between scenarios for the urban & peri-urban to rural ratio are not significant, but as this ratio generally increases, we can conclude that the current trend for slower growth, in terms of new buildings, in rural areas (compared to urban and peri-urban areas) will continue whatever the scenario. On the other hand, the urban to peri-urban ratio does show significant differences, at least between the A (hyper-tech and extreme water) and B (peak oil and fragmentation) type scenarios. This indicates that the scenarios differ mostly in the distribution of new artificial surfaces within the urban/peri-urban areas.

These results show how planning policy may shape land-use patterns and potentially create a more sustainable future. The scenarios mostly contain advantages offset by disadvantages, such as sustainable growth in reaction to an oil price shock (B1). A more pro-active planning policy could mitigate the less desirable aspects while aiming for the outcome of the preferred scenario.

*Sophie Rickebusch and Mark Rounsevell,  
University of Edinburgh*



# PLUREL's contribution to the European policy debate on urban-rural linkages



**EU policies and initiatives are increasingly recognising the importance of urban-rural linkages. PLUREL actively contributes to these debates, in close dialogue with key stakeholders.**

Spatial development policies in Europe are mainly a domain of the national states or their sub-entities such as regions and municipalities. The European Union (EU) does not have authority for spatial planning nor for territorial development. It does have, however, a crucial influence on spatial development in Europe with its various sectoral policies and the joint development of guidelines and principles with the member states. In recent years, peri-urban areas and urban-rural relationships have received more prominent part in these documents.

A central document regarding urban-rural partnerships in Europe, and spatial development in general is the European Spatial Development Perspective (ESDP) adopted in 1999 by the Ministers of the then 15 EU member states. ESDP is still an important reference document, setting out a number of policy goals and aims. For urban-rural partnerships it points out that these should be voluntary and built on equality and independence of partners. The basic element is the acknow-

ledgement of the common benefit, i.e. that partnerships across administrative borders have positive effects, something which cannot be achieved in separation. Cooperation across the urban-rural interface leads to more efficient land use planning, better management of natural resources, and makes it easier to maintain a basic supply of service and public transport.

## Reinforcing the territorial dimension

The European Commission's Green Paper on »Territorial Cohesion« (October 2008) further sharpened the role of urban-rural linkages for a more balanced and harmonious development. It also highlighted the challenge of the diverse settlement pattern of the EU. The participation rate in the proceeding consultation process showed the importance of the topic. There was consensus on six strands regarding the reinforcement of the territorial dimension in policy design and implementation:

- Coordinated public policies at different levels.
- Better account of territorial impacts.
- Improved multi-level governance.
- Need for functional approaches – regions yes, but also consideration of other geographies where appropriate; e.g., river basins, mountain areas,

networks of towns, metropolitan areas, deprived neighbourhoods.

- Territorial cooperation as a clear EU asset.
- Reinforced evidence base – better territorial knowledge is needed.

## Important role for PLUREL

PLUREL is directly focused on several of these topics, while others are dealt with indirectly as they all have influences on urban-rural land use changes. Today's policies often imply a clear distinction between urban and rural issues which is unfit to the increasing interdependency of rural and urban in the regions. A more holistic and territorially oriented perspective is needed concerning the development of future sustainable EU agricultural and structural policies. PLUREL, by its high ambitions regarding dissemination of the project's results to European, national and regional policy makers and planners, will highlight this and give a science-based input to the debate.

Besides making the project's results accessible to everybody on the internet, PLUREL is engaged in discussions with important stakeholder networks to foster the importance of urban-rural linkages for a sustainable development in Europe. PLUREL cooperates with the PURPLE network (Peri-Urban Regions Platform



PHOTO: KJELL NILSSON

# Landscape functions in peri-urban areas and the impact of urbanisation

**Urbanisation – as physical land conversion or as socio-cultural change of rural areas – is mostly concentrated at the peri-urban fringes of cities and agglomerations. Especially the surrounding open spaces and landscapes, usually important providers of environmental functions and recreational space, are under pressure. To analyse these impacts, we assess land-cover, landscape structures and functions on various spatial levels, considering the broad diversity of conditions.**

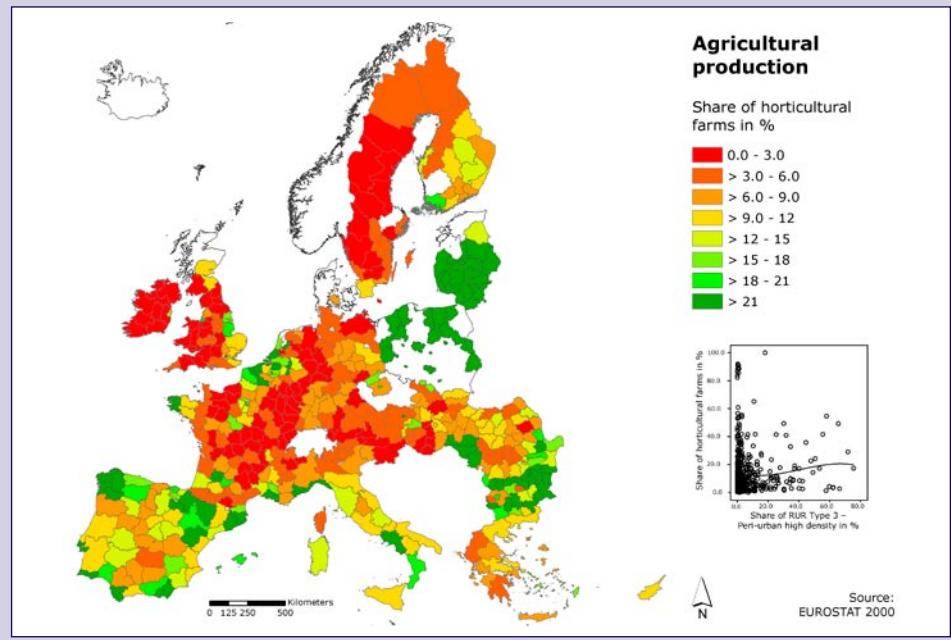
Agriculture remains an important actor for spatial development in the peri-urban fringe, despite fundamental changes such as globalisation of food production. The proximity to urban areas as centres for demand and consumption offers market opportunities for agricultural goods and services. Facing growing global demand and increased prices for food, higher energy and transportation costs as well as the growing urban demand for local food, the maintaining agricultural production is important for food security reasons. As a major factor in urbanisation history, fertile soils are often situated close to urban areas, which therefore play a role as prime agricultural area. Spill-over from urban areas enables innovative and flex-

ible adaption of production in rural areas nearby, especially in the case of horticulture (fruit and vegetable production).

## Providing landscape functions

Traditional functions of agriculture are increasingly replaced by new ones, such as provision of landscape diversity, amenities or nature conservation. Peri-urban areas contribute to the regional provision of drinking water, to soil protection, flood control and moderation of urban climate. Local self-sustenance, provision of biotic and abiotic resources, and resilience to changing framework conditions gain more attention. With moderate urban density and landscape heterogeneity, peri-urban areas offer niches for flora and fauna, resulting in considerable species diversity and abundance.

Natural amenities characterised by immobile nature provided in landscapes and open spaces near urban areas improve the region's recreational capacity. They contribute to healthy, liveable and sustainable cities. Many surveys and hedonic price models underline urban dwellers' preferences for woodland, farmland and other natural amenities. In a leisure-oriented and ageing society, peri-urban areas increasingly fulfil tasks as recreational and residential places.



Europe), and contributes to the CURE initiative (Convention for a Sustainable Urban and Rural Europe), invited by DGRegio. A close link between PURPLE and PLUREL can promote both the dissemination of the knowledge on rural-urban linkages gained in the project and at the same time support the network's targets. On November 12, 2009, PLUREL and PURPLE will also discuss what is needed to ensure a sustainable and successful future for Europe's peri-urban regions in a seminar at Committee of the Regions in Brussels. PLUREL will continue working with the CURE initiative, focusing on how cities and rural regions can work together to achieve a sustainable future for both sides.

Policies on the European level – are they on infrastructure construction, environmental protection, rural development or regional cohesion – can have a significant impact on the development of urban-rural linkages. PLUREL contributes to the debate by improving the evidence base of territorial processes and the knowledge exchange on spatial policies.

*Kjell Nilsson, Thomas Sick Nielsen and Christian Fertner, Danish Centre for Forest, Landscape and Planning, University of Copenhagen*

## **Impact on landscape and ecosystem**

The particular situation of peri-urban regions proves to be highly dynamic within land use change. Characteristic framework conditions exist, affecting landscape structure, integrity and accordingly the functional capability. In the past, agricultural areas were often reduced to a »reserve space« for urbanisation demand, leading to loss of valuable farmland.

Proximity to urban areas resulted in additional restrictions and conflicts, such as pollution, disruption by infrastructure networks, high land prices, and legal constraints limiting agricultural operations and profitability. Hobby farming and rural retirement migration represent recent processes which reduce the agricultural production value of peri-urban areas.

High levels of human activity, population density, soil sealing and emission volumes affect ecologically valuable habitats or single species in the peri-urban countryside. Anthropogenic pressures from the growth of settlement and infrastructure network cause cumulative impacts, such as edge effects, habitat loss and disruption, or reduction of connectivity. Negative effects on species, like composition change, homogenisation, or diminished populations are reported for many different kinds of flora and fauna.

Recreational and aesthetical values are related to the bio-physical and climatic conditions of the regions. Still, areas of high environmental value, such as coastal, riparian or mountainous areas, are under urbanisation pressure. Accessibility and exploitation of open spaces is enhanced through the infrastructure expansion, while fragmentation and loss of natural spaces degrade recreational capacity.

PLUREL aims to gain more specific knowledge on the status of peri-urban landscape functions in different European regions, and their responses under different future scenarios. This helps to better identify where urbanisation pressures are more likely to have particular negative impacts, and where counteractions are necessary. Vice versa, we aim to reveal the potentials for vivid, diverse and multi-functional peri-urban landscapes and to support strengthening strategies and measures.

*Annette Piorr and Ingo Zasada, Leibniz Centre for Agricultural Landscape Research (ZALF) Müncheberg*

# **Montpellier Agglomeration: Experimenting with sustainable growth on the Mediterranean seaside?**



SOURCE: MONTPELLIER AGGLOMERATION

**Montpellier is the capital city of the Languedoc-Roussillon administrative region located on the Mediterranean seaside. The urban region's population has been growing rapidly during the last decades. Urban sprawl has occurred on former peri-urban farmland and has caused dramatic landscape changes.**

No coordinated management of urban development existed until the Montpellier Agglomération (MA) was established during late 2001. This new local government brings together 31 municipalities for joint projects in urban planning and development. Main instrument is the scheme of territorial coherence, SCOT (Schéma de Cohérence Territoriale), which provides overall planning directions for the agglomeration during the next 15 years.

## **A changing region**

MA comprises 434 km<sup>2</sup>, with 31 municipalities and 406,140 inhabitants in 2006 (935 inhabitants/km<sup>2</sup>), that is almost 40,000 inhabitants more than in 1999. The urban functional area of Montpellier currently comprises over 510,000

inhabitants (50,000 more than in 1999). Since 1960, changes have not only been demographic. Economic change involved activities of the new economy and of universities, and development of new transportation and touristic infrastructure (e.g. seaside resorts). Changes have also included a new role as »technopolis« since the 1980s, social and transport evolutions such as housing in the outskirts of smaller settlements surrounding Montpellier and the move towards a car-based way of life. As a result, MA has become characterised by its young population of 60,000 students and many young adults working in the new economy. This has led to large-scale demographic growth and great pressure on housing resulting in urban sprawl.

During the three last decades, traditionally strong centralized administration in France has become more decentralised. In the urban planning process, state officers now act as advisers and controllers. This includes providing state opinions on environmental issues when evaluating urban plans and controlling decisions made by local councils. Except for some issues

of national interest, all decisions on urban planning and management of urban fringes are taken locally. The national »urban solidarity and renewal law« of 2000 established new rules with the local urbanism plan, PLU (Plan Local d'Urbanisme). PLU also imposes spatial planning at the inter-municipal level through its scheme of territorial coherence (SCOT). Planning policies at both municipal and inter-municipal levels must now be formalised in a project report, with maps identifying the different status of land concerned by the project. PLU must be compatible with SCOT and participatory methods are supposed to be part of local planning processes.

### Land use and environmental challenges

SCOT, elaborated during 2002-2005, was approved by the Municipal Council in February 2006. As MA only includes 31 local authorities, it does not control all of the urban functional area (93 authorities). Montpellier and its surroundings are very attractive, leading to large space consumption for housing and transportation. Finally, land prices are rising steadily, leading to land discrimination, particularly outside of MA due to its social mix policy. Land price increases are putting pressure on farmers to sell their land for development, as most traditional farming systems are no longer economically viable in their globalising and urbanising context.

Main environmental issues are quality of life, housing and transportation, water and waste management, preservation of open spaces (cropland and natural patches), conserving the areas high biodiversity (for example in the coastal lagoons) and management of natural risks (floods, fire). MA's geographic position explains the occurrence of climatic hazards like flash floods caused by heavy autumn storms. Flood risks are significant and drive the region's urban planning policies. Moreover, with urban sprawl, the wildland-urban interfaces are increasing and thus the risk of devastating forest fires.

Containing urban sprawl, preserving the quality of natural environment and supporting economic activities are the main challenges faced by MA. The hot political topic at the time is enlargement of the agglomeration to over 500,000 inhabitants and more than 50 municipalities.

Jean-Pierre Chery, CEMAGREF and Françoise Jarrige, SupAgro

# PLUREL People

Interview with Ingo Zasada, Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg



### What is your role in PLUREL?

I take part in the ZALF working group's statistical analysis and modelling work on response functions for sustainability impacts of urban land use change. Along with our interest in urbanisation related changes in landscape and its various properties (e.g. agriculture, biodiversity and recreation), we analyse differences and similarities of regions across Europe. Additionally, I bring in my PhD-study on the topic of multifunctionality in peri-urban landscapes.

### How will PLUREL benefit from your specific expertise?

With an educational background in urban and regional planning, I contribute to the integrative work within this interdisciplinary project. My PhD-work and the project tasks are linked in various ways. Moreover, PLUREL offers great personal opportunity to me. I can obtain insights and experiences in a prime research environment, through dialogue with experts from different research backgrounds and with experience in using different methodological approaches.

### What will be PLUREL's most important results?

Participation of researchers from many different disciplines enables a comprehensive approach to the complex topic of sustainability impact assessment for urban-rural-linkages. The research team has produced numerous results at different spatial scales and stages, as well as by transferring scientific knowledge into policy implementation. Despite the enor-

mous communication and coordination requirements involved, I am confident that some highly integrated, value-adding chains of results will be the most important research outputs.

### Which challenges can stand in the way of PLUREL's success?

Although my experiences with this type research projects are rather limited, my impression is that a large project like PLUREL not only demands particular managing efforts. Also needed is a broad agreement on and commitment towards the aims of the project among participants, even when these are beyond their own research fields. In this way, isolated and uncoordinated individual contributions can be avoided.

### Why should policy-makers be interested in PLUREL?

Europe's peri-urban areas represent a policy arena characterised by its density of actors, interest groups and land claims, high land use dynamics and corresponding impacts on sustainability. These affect the quality of life of large parts of society. But peri-urban areas enjoy only limited attention from policy-makers and the public. Often decision-making about these areas is fragmented between differing and competing institutions and responsibilities. Therefore PLUREL addresses questions of particular relevance to peri-urban areas. The project provides research findings developed in close contact with practitioners and stakeholders in the varying spatial contexts of peri-urban case study regions.

### Upcoming events

*International conference organised by the PLUREL project:*

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

**Dates:** 18-21 October, 2010

**Venue:** Faculty of Life Sciences, University of Copenhagen, Denmark

Deadline for abstracts March 1, 2010 • [www.plurel.net/conference](http://www.plurel.net/conference)

*Conference organised by PURPLE, Peri-Urban Regions Platform Europe:*

Europes peri-urban potential: beyond urban-rural links; Ensuring a sustainable and successful future for Europes peri-urban regions

**Date:** Thursday November 12, 2009 (14:00-18:00 hrs)

**Venue:** Committee of the Regions, Brussels, Belgium

# PLUREL



## PLUREL Partners

- University of Copenhagen, Denmark
- Helmholtz Zentrum für Umweltforschung, UFZ, Germany
- Leibniz Centre for Agricultural Landscape Research, Germany
- Wageningen UR / Alterra, The Netherlands
- IIASA, International Institute for Applied Systems Analysis, Austria
- ARC systems research GmbH, Austria
- Institute for Local Government Studies, Denmark
- The Finnish Environment Institute, Finland
- University of Paris I & COE/CCIP, France
- Agricultural and environmental engineering research centre, CEMAGREF, France
- Centre for European Economic Research GmbH, Germany
- Christian-Albrechts-University of Kiel, Germany
- University of Thessaly, Greece
- Metropolitan Research Institute, Hungary
- University College Dublin, Ireland
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- University of Bath, United Kingdom
- University of Manchester, United Kingdom
- Edinburgh College of Art, United Kingdom
- Scandinavian Branding A/S, Denmark
- Büro für urbane Projekte, Germany
- Studio Mediterana, architecture designing, advisory and investment inc., Slovenia
- Munich Design International, Germany
- RAL2005 Architects, The Netherlands
- University of Groningen, The Netherlands
- Queen's University Belfast, United Kingdom
- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France
- University of Edinburgh, United Kingdom
- Wageningen UR / Van Hall Larenstein, The Netherlands

## Peri-urban Land Use Relationships

*Strategies and Sustainability Assessment Tools  
for Urban-Rural Linkages*

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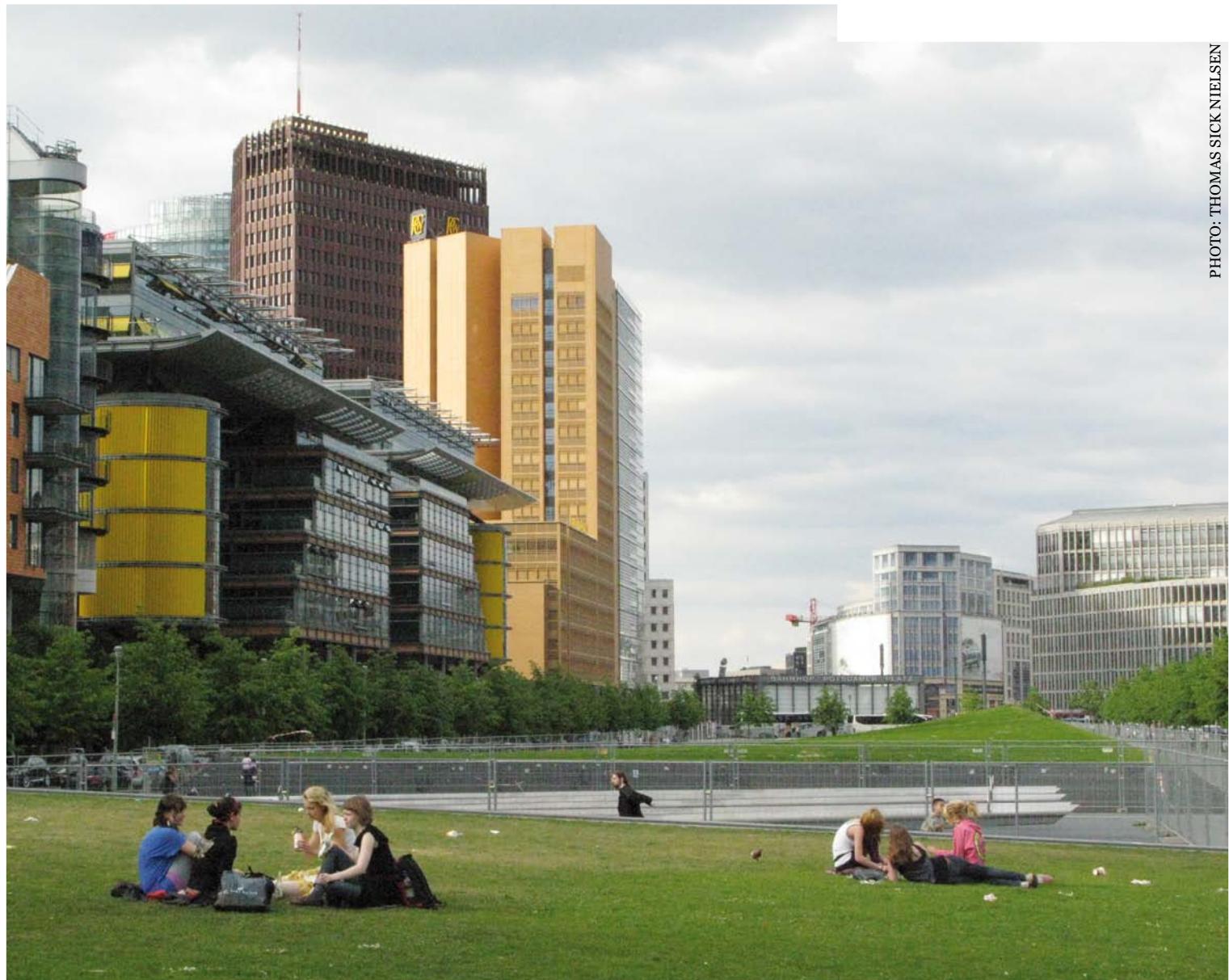
## Layout & Production

Jette Alsing Larsen

**PLUREL is an Integrated Project under  
EU's 6<sup>th</sup> Framework Programme**



**www.plurel.net**



# Sustainable urbanisation: new tool for impact analysis

**One of the new decision-support tools developed in PLUREL is its Integrated Impact Analysis Tool (iIAT in brief). It compiles results from quantitative modelling of urbanisation and expected impacts on sustainable development at the European scale and for regional case studies.**

With iIAT, users can conduct an integrated analysis of the situation in 2000, and of different scenarios of future development under global change trends. The tool's main purpose is to create awareness on how sustainability is affected at different scales for different types of regions. Moreover, iIAT helps identify where

policy action might be necessary, both thematically and spatially.

The iIAT has two modules that cover two different spatial levels. The iIAT-EU covers 543 so-called NUTSX regions of the EU-27. The user can choose between two options: an aggregated sustainability

analysis which considers a predefined set of indicators covering the economic, environmental and social dimension, and a free selection of 3-12 out of some 30 indicators with relevance for urban-rural functions. The iIAT-Region displays results from regional case studies.

### **Behind the surface: modelling in PLUREL**

Impact analysis of urbanisation trends is a key research objective of PLUREL. Research questions addressed include: What can we learn about future urbanisation trends and their impacts in different parts of Europe? What is the specific role of the peri-urban sphere in the process of urban growth? How can we understand the relationships between urbanisation and its functional impacts in their spatial dimension? Does the governmental and planning framework affect urban growth or its impacts? Is it possible to identify and enhance understanding of the specifics of functional changes due to urbanisation within and between regions?

To answer these questions, PLUREL research applies models. Quantitative models, represented by mathematical algorithms, capture underlying causal pressure-state-impacts relationships, based on European and regional statistical and spatial data. Under the conditions of a scenario framework, development trajectories of global driving forces are explored for the years 2015 and 2025. Based on this, results from a land use change model (RUG) and Response Functions, regression models for impact indicators are integrated at the European level. Modelling at the regional level is carried out by means of the MOLAND model, which generates future land use distribution maps for planning scenarios on the basis of Corine Land Cover and statistical data. Generic models are rule and knowledge based, implying that they generalise a series of good practice examples following defined scientific procedures. Meta models, finally, integrate quantitative and qualitative information derived from different models. The iIAT compiles model results in two databases. Based on these, it carries out user-determined queries based on data aggregation procedures applying typologies.

### **The surface: a tool that meets user demands**

PLUREL iIAT is accessible through the internet. The tool displays results in the

form of so-called spidergrams, diagrams which facilitate understanding of multi-level information. The tool is interactive, offering the possibility for an in-depth view into different thematic and regional scopes and different scales, according to individual user interest. It accesses the impact assessment result database, and generates the demanded outputs in the graphical user interface. Through the latter it is possible to explore sustainable development trajectories, the effects of the regional framework, and planning policies and local governance. By its two

different-level spatial modules, iIAT facilitates discussions of heterogeneous end user groups, ranging from an EU policy assistant to a local planner. Joint working with the tool promotes learning processes concerning different views on land use development.

### **The iIAT indicators**

Users can choose between an aggregated sustainability analysis carried out for a predefined list of indicators, or a free combination of 3-12 indicators out of those included (specific indicators ana-

*Table 1. Aggregated Sustainability Analysis.*

Sustainability issue	iIAT-EU (NUTSX) Indicators	iIAT-Region (case studies) Indicators
<b>Social</b>	Single person household ratio Ageing Employment ratio	Quality of life Housing
<b>Environmental</b>	Biodiversity Emissions Recreation	Climate adaptation and mitigation Ecologic regulation and biodiversity Living environment
<b>Economic</b>	Economic performance Educational level Agricultural production	Economic performance Resource provision Transportation

*Table 2. Specific Indicators Analysis.*

Sustainability issue	iIAT-EU (NUTSX) Indicators	iIAT-Region (case studies) Indicators
<b>Social</b>	1 person households 2 person households 3 person households 4 person households Educational level 1 Educational level 2 Educational level 3 Educational level 4 Population < 15 years Population > 60 years	Quality of life - overall measure Quality of life - noise pollution Quality of life - access to green space Quality of life - public transport Quality of life - shops in vicinity Quality of life - air quality Availability of recreational green space Energy provision
<b>Environmental</b>	No of Endangered Bird Species per 100 km <sup>2</sup> Interspersion and Juxtaposition Index Landscape Shape Index Effective Mesh Size Green Background Index Heavy Metal and other Emissions NOx Emissions CO Emissions HC Emissions	Breeding bird community Water supply Food production Land surface emissivity Carbon stock in vegetation and soil ETP (EvapoTransPiration)
<b>Economic</b>	GDP Total Employment Employment Sector I Employment Sector II Employment Sector III Employment Sector IV Artificial Area Agricultural Area Part-time farm holders	GDP External costs green space Costs Carbon stock Costs Air pollution

lysis). Both options are summarised in their respective table.

### Using the iIAT-EU

To carry out comparisons, users can choose either specific or groups of regions, e.g. the entire EU-27 or all predominantly peri-urban regions of Europe. Each NUTSX region is characterised by an urban structure, and a bio-physical, socio-economic and regulatory profile, resulting from attributes that are derived from the different typologies. The latter include, for example, rural-urban-region-type, spatial planning type or level of vulnerability, innovation and accessibility. In the functionality of iIAT-EU, these act as filter for the generation of grouped average indicator values. The data themselves will be transformed into standardised values in order to unify the scale of output data values between indicators.

The first figure offers an example of how iIAT-EU can be used for answering a specific comparative question. Assuming an oil crisis scenario, results show that peri-urban regions with different types of accessibility will differ in their artificial surface growth, as well as in related increase of employment, and related negative impacts on bird habitats. However, there are hardly any impacts on emissions (cf. Fig. 1).

### Using the iIAT-Region

The iIAT-Region approach allows selecting or adapting the indicators listed in the tables. It also allows for using thresholds or for determining target values for single indicators. Based on these, the system will display the reciprocal effect on other indicators, as calculated by PLUREL's Multi-Criteria Analysis tool. Inputs to iIAT include land use change data and impact assessment models. As output, iIAT computes interactively composed integrated spidergrams for

- different land use scenarios per urban region,
- a range of indicators comparing different urban regions, and
- a single indicator displayed for different urban regions and scenarios.

An example is shown in the screenshot of the iIAT-Region prototype (cf. Fig. 2).

The interactivity of the tool is similar as for iIAT-EU, allowing for comparison of existing results. Results are directly depicted as spidergrams, without any of the

### How to use the iIAT

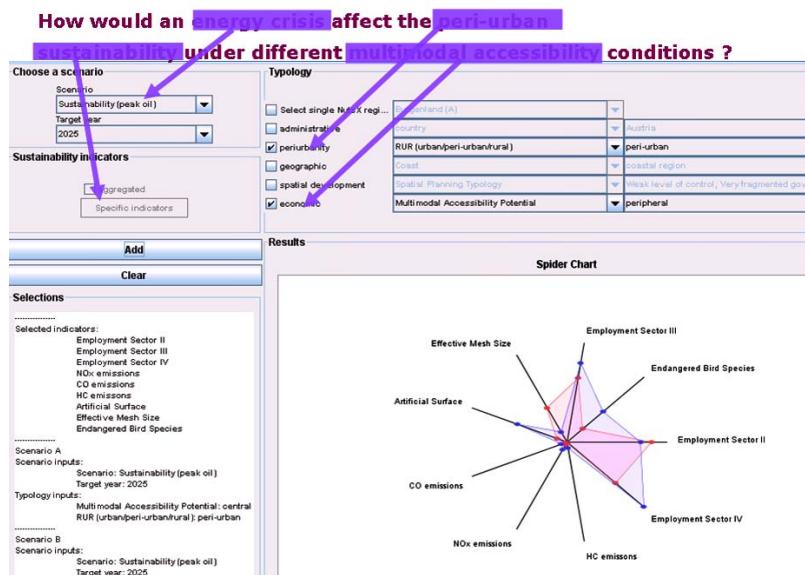


Fig. 1. Example of how to use the iIAT-EU.

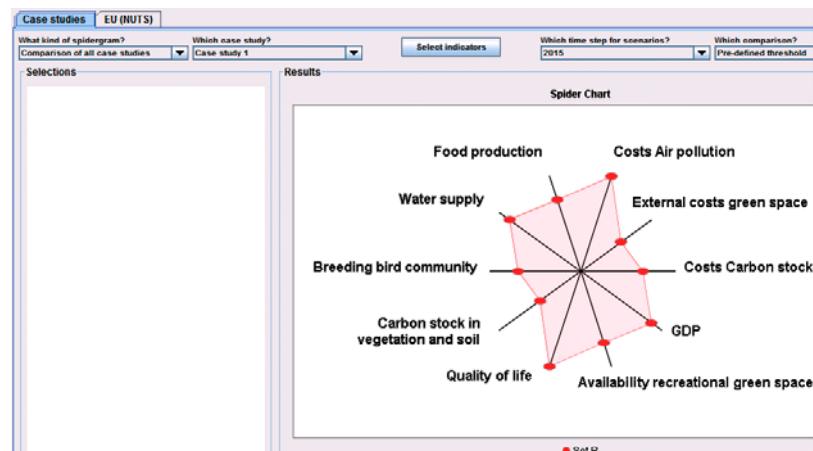
steps (in the form of tables) in between. The tool offers a methodology to include new MOLAND light model or other data, for example when a specific rural-urban-region wants to compare different planning options with its own indicators. The iIAT-Region identifies key questions of policy relevance. However, it does not assess impacts as sustainable or non-sustainable. Its purpose is to allow for stakeholders to interpret changes of impact issues, and to discuss interdependencies and their changes. In its present form, the tool does not (yet) deliver results for scenarios, specific regions, or indicators that were not computed by the PLUREL team. Neither does iIAT-Region currently

plots maps. Even though it is not participatory in nature, the tool does facilitate participatory decision processes involving practitioners and/or policy makers.

The iIAT has been developed by a number of PLUREL partner institutions. It will be online accessible by the end of 2010.

*Annette Piorr, Ingo Zasada, Regine Berges, Dirk Pohle, Leibniz Centre for Agricultural Landscape Research (ZALF), Müncheberg  
Dagmar Haase, Nina Schwarze, Helmholtz Centre for Environmental Research – UFZ, Leipzig (Haase also Humboldt University Berlin)*

Fig. 2. Screenshot of the iIAT-Region prototype.



# Planning instruments to control urban growth



**It is challenging to plan and control urban development in peri-urban areas. But if no planning is done, the result will often be unsustainable, including widespread, dispersed and uncoordinated urban growth. Spatial planning based on zoning remains the most important planning instrument and its success depends on regional coordination. Incentive based instruments may contribute to growth management, but only few examples are available and their effects on urban growth patterns yet to be seen.**

PLUREL has investigated the potential of different government structures, policies and instruments to deal with the problem of sprawl based on European cases, while also looking at China (Hangzhou) and the United States (Portland and Seattle).

**Legal system and planning authority**  
Some planning instruments are defined nationally as frameworks within which regional and local levels have to operate. A legal system which empowers both planning and regulating urban development, and protects agricultural and natu-

ral areas, is of course of vital importance. Moreover, there is need for a planning system which ensures that local and municipal planning adheres to national policies and regional plans. Also essential is the existence of a regional planning authority with sufficient legal power, and with good professional competencies and negotiation skills to ensure a broad acceptance among local authorities. Regional co-ordination is that important because peri-urban municipalities often have less professional resources for spatial planning. Moreover, they often have a strong »individual« interest in a regionally dispersed urbanisation.

## Visions and economic instruments

To support broad acceptance, a strong and clear »easy-to-grasp« vision for regional development can potentially guide all planning efforts in the region. Good, well-known examples accepted by professionals, politicians and the wider public alike, include visions such as »The Green Heart« of the Dutch Randstad, the »Urban Growth Boundary« of Portland (which is even mentioned in poetry and art), and the »Fingerplan« of Copenhagen.

Economic incentives and taxation developed for other purposes have long had – sometimes unintended – influence on spatial patterns. Differentiated taxation for different municipalities of a region is a well known »instrument« to disperse urban development. Other examples are various types of public support for commuters. Government support of agriculture tends to preserve agricultural areas, while support of urban regeneration encourages densification of urban development. In some cases, targeted economic incentives have been applied for directing urban development towards existing urban areas or for supporting farmers at the urban fringes. These include transfer of development rights in Seattle and support for »Blue-Green services« in The Hague, Netherlands. The efficiency of these policies in the long run remains to be seen.

## Coordination and the prevalence of zoning

While there is evidence of mobility impacts on urban dispersion, there is little direct evidence of the contribution of infrastructure investments to the prevention of sprawl and containing of urban



# Monetary valuation of peri-urban changes in The Hague and Warsaw

**Study of citizens' preferences and willingness to pay provides important information to decision-makers about alternative possible options. PLUREL investigates the importance of this type of research. Examples from the project's case studies in The Hague and Warsaw illustrate this.**

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 insight in the public's preferences on the effects of those policies, as well to assess how much citizens are willing to pay to implement those changes.

## Studying effects of land use policies

Within PLUREL, public preferences on the effects of hypothetical but realistic policies affecting land use at the urban and peri-urban level were studied. This was done by using Choice Experiments, a survey-based technique. Here we report the results from the cities of Warsaw, Poland, and The Hague, Netherlands.

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 to the case studies chosen. These effects are

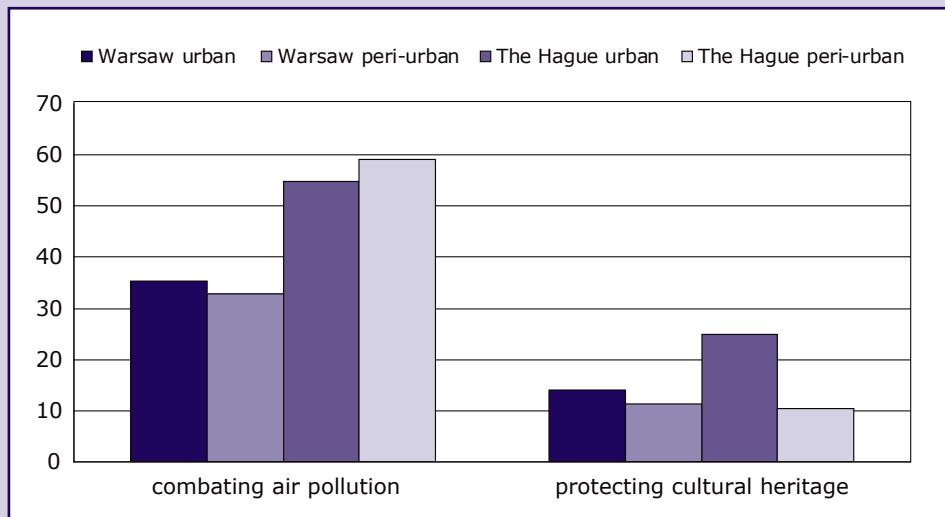
- (i) improvement in air pollution caused by transportation;
- (ii) protection of cultural heritage monuments;
- (iii) development of new housing in green open spaces; and
- (iv) development of new housing by refurbishing abandoned buildings, hence protecting green open spaces.

We investigated citizens' preferences and Willingness To Pay (WTP), expressed as a one-off tax, for the four effects. This was done by administering a choice experiment internet-based questionnaire to a sample of 500 respondents in every city.

## Results from Warsaw and The Hague

The results from the choice experiments data show that respondents in both cities are strongly against developing new houses in green open spaces. In Warsaw,

*Willingness to pay in euros for selected effects of land use policies.*



*Gertrud Jørgensen and Thomas Sick Nielsen, Danish Centre of Forest, Landscape and Planning, University of Copenhagen*

respondents consider housing an important problem that should be solved by refurbishing abandoned buildings mostly in the urban area. Respondents favour policies that reduce air pollution from transport and protect cultural heritage. On average, citizens living in urban (peri-urban) areas are willing to pay €35 (€32) to decrease air pollution. With regards to cultural heritage, urban residents are willing to pay €14, and peri-urban residents €11, to protect cultural heritage monuments.

In The Hague, respondents favour combating air pollution and protecting cultural heritage monuments over solving housing problems. Respondents living in urban areas are willing to pay €55 to improve air quality and €25 to protect cultural heritage monuments. Respondents living in peri-urban areas consider air pollution more important than their urban counterparts, but they are less concerned about 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.

There are clear differences in the results from the two cities. However, it appears that in both cities, among the effects considered by this study, respondents consider improving air pollution caused by transport as the most important effect to be considered by a land use policy.

*Alberto Longo, Marco Boeri, Queen's University Belfast, and Tim Taylor, University of Bath*

# Manchester city-region – post-industrial peri-urban in search of a future

**Manchester was one of the world's first industrialized and global trading cities, creating notorious levels of pollution and industrial sprawl. 150 years later the peri-urban is divided in many ways, with beautiful green infrastructure side by side with post-industrial waste. In each case there are local agendas struggling with global forces, re-inventing a future role and identity in a complex metropolitan landscape or »metro-scape«.**

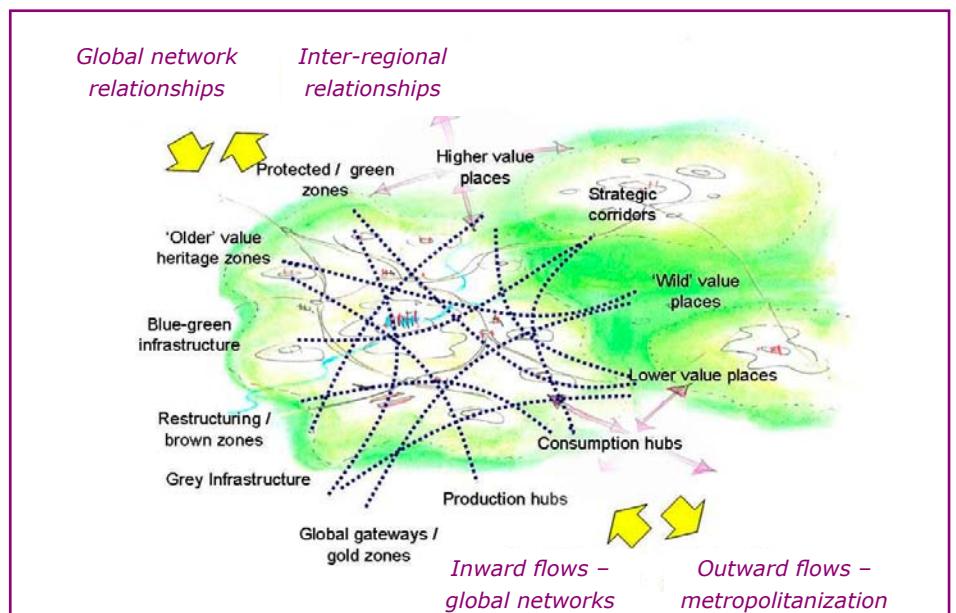
Greater Manchester (GM) in England is a conurbation of 2.5 million people, in 10 municipalities, with an area of 1280 km<sup>2</sup>. A larger »rural-urban-region«, roughly a 1 hour commuting distance, has a population of nearly 4 million. At its core, the city of Manchester was one of the world's first industrialized and global trading cities. Its population grew rapidly from 1750 – 1900, and then declined from 1950 due to industrial restructuring. Since 1990 the population has returned to the city centre and some regeneration areas, many inner city neighbourhoods have stabilized, but some continue to be fragmented and chaotic.

## Peri-urban landscape transitions

In the wider peri-urban area, there is a complex family of satellites – larger towns, smaller towns, new commuting settlements, peripheral public housing, and scattered settlements. In the upland landscapes of the South Pennines, most farming has declined, former industrial pollution has been cleaned up, natural areas have been conserved, and much countryside is accessible to the public. In the Mersey Belt area between Manchester and Liverpool, there are post-industrial landscapes still damaged by urban infrastructure and commercial development. And in the lowland farming areas of Cheshire, many settlements are dominated by wealthy commuters.

The PLUREL research approach aimed to look beyond the surface to explore three main peri-urban transitions:

- Metropolization: an urban transition, networked across wider peri-urban and rural areas;
- Cultural capitalism: a global transition – new patterns of globalizing economic / social structures and activities;



# PLUREL People



*Interview with Dagmar Haase, Humboldt University Berlin and Helmholtz Centre for Environmental Research – UFZ, Leipzig, Germany.*

- Spatial ecology: a green infrastructure transition, with trends of localization and new identities of place.

## Transitions in governance and social structures

Hanging over each of these are transitions in governance and social structures. Greater Manchester itself has a fragmented governance, split between ten independent municipalities. However there are experiments in progress with new forms of partnerships and consortiums.

The UK government has set up a City-Region Pilot programme, with a set of Commissions on environment, economy, housing etc, and a novel Low Carbon Economic Area Initiative. There is a relatively strong spatial planning system, and long experience of urban fringe policies and programmes.

While physical development is limited by the Green Belt and similar policies, social / economic / cultural change in the peri-urban area is rapid (depending on how it is measured). So the agenda is how to respond to new types of problems and opportunities in the peri-urban – not just physical sprawl, but the social / economic / cultural fallout from a large and messy urban system.

Overall the Manchester city-region shows a possible future path, with lessons for other parts of the EU. With a (more or less) effective spatial planning system, there is much experience in partnership agencies and multi-functional land-use. However there are also powerful forces, of globalization and privatization, social exclusion and fragmentation, and governance systems in continuous flux, which increase the challenge of the peri-urban agenda and the uncertainty of its future.

*Joe Ravetz, Centre for Urban & Regional Ecology, University of Manchester*

## What is your role in PLUREL?

I coordinate regional-scale land use and impact modelling work and coordinate the Leipzig-Halle case study. Through involvement in the land use change modelling activities with MOLAND, in a region struggling in close vicinity of peri-urban growth and urban decline, one of my research priorities in PLUREL is to »place« shrinkage into land use modelling and impact assessment.

## How will PLUREL benefit from your specific expertise?

I am a trained geographer and landscape ecologist and have quite some experience with interdisciplinary work. In an EU-funded project on adaptive management, I learnt working together with stakeholders and conducting participatory modelling work, an experience of benefit to the work in PLUREL. Moreover, the expertise of our entire UFZ-group in terms of quantitative analysis of land use changes is important for the project. Additionally, I am one of the contributors to agent-based modelling in PLUREL.

## What will be PLUREL's most important results?

PLUREL develops methods and tools for assessing the impacts of land use change in peri-urban Europe. We compiled an up-to-date pan-European database on where either land consumption or abandonment is taking place in European rural-to-urban regions. Our scenarios then show where this will happen in the future. Based on locally adapted, participative scenario workshops, PLUREL developed spatially explicit land use change maps for selected rural-to-urban regions

in Europe. These help evaluate the impact of planning and governance strategies on land use. The »light« version of MOLAND was specifically developed for screening processes at the regional level. PLUREL developed an integrated Impact Assessment Tool (iIAT) that summarises the manifold impacts of peri-urban land use change in easily comprehensible »spidergrams«.

## Which challenges can stand in the way of PLUREL's success?

After three years of intensive research work, PLUREL has entered its final phase. All groups are working on the final products that will integrate our work, something requiring a lot of communication in order to fine tune the tools and their application by practitioners. In the case studies, considerable effort will be directed towards national and regional dissemination activities.

## Why should policy-makers be interested in PLUREL?

PLUREL is among the largest land-use related EU-projects, bringing together vast experience in land use modelling and planning. It develops pan-European and regionally specific tools for assessing the impacts of urban growth and shrinkage, and for evaluating current land use planning and management strategies. The rich expertise and tools developed during four years of research will be offered in an easy-access format through the Xplorer platform. I think that every European and regional policy analyst, planner and policy maker should have a close look at this excellent instrument.

## Upcoming events

### PLUREL's International conference:

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

19-22 October, 2010, Copenhagen, Denmark

**Now open for registration at [www.plurel.net/conference](http://www.plurel.net/conference)**

# PLUREL



## PLUREL Partners

- University of Copenhagen, Denmark
- Helmholtz Zentrum für Umweltforschung, UFZ, Germany
- Leibniz Centre for Agricultural Landscape Research, Germany
- Wageningen UR / Alterra, The Netherlands
- IIASA, International Institute for Applied Systems Analysis, Austria
- Austrian Institute of Technology, Austria
- Institute for Local Government Studies, Denmark
- The Finnish Environment Institute, Finland
- University of Paris I & COE/CCIP, France
- Agricultural and environmental engineering research centre, CEMAGREF, France
- Christian-Albrechts-University of Kiel, Germany
- University of Thessaly, Greece
- Metropolitan Research Institute, Hungary
- University College Dublin, Ireland
- EC-DG Joint Research Centre, Italy
- Polish Academy of Sciences, Poland
- University of Ljubljana, Slovenia
- University of Bath, United Kingdom
- University of Manchester, United Kingdom
- Edinburgh College of Art, United Kingdom
- Scandinavian Branding A/S, Denmark
- Büro für urbane Projekte, Germany
- Studio Mediterana, Slovenia
- Munich Design International, Germany
- University of Groningen, The Netherlands
- Queen's University Belfast, United Kingdom
- The Chinese Academy of Forestry, China
- Alfred Peter Paysagiste, France
- University of Edinburgh, United Kingdom
- Wageningen UR / Van Hall Larenstein, The Netherlands
- Doepel Strijkers Architects, The Netherlands
- Research Institute for Knowledge Systems, The Netherlands
- Technische Universität München, Germany

## Peri-urban Land Use Relationships

*Strategies and Sustainability Assessment Tools  
for Urban-Rural Linkages*

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[www.plurel.net](http://www.plurel.net)



PHOTO: THOMAS SICK NIELSEN

## Sustainable urban-rural futures

– Need for a coherent EU policy and innovative regional strategies

**Urban land use is by far the most rapidly expanding land use change in Europe. Urban development has many positive effects, for example as an engine for economic development. However, it can also have serious negative social and environmental consequences, e.g. through**

**urban sprawl. This article shows how the PLUREL project has studied strategies for sustainable urban-rural futures.**

A better balanced and sustainable development requires more policy attention at the regional level and for the urban-rural

interface. The EU can promote integrated rural-urban development by targeting its policies and funding towards peri-urban areas.

**Urban expansion as dominant land use change**  
Regardless which future scenario we

choose, urban expansion will continue at a rate of 0.4 – 0.7 % per year. According to figures calculated by means of the NEMESIS econometric model developed by the Research Laboratory ERASME in Paris, this is more than 10 times higher than the rate for any other land use change. Peri-urban areas, i.e. discontinuously built development containing settlements of less than 20,000 inhabitants and with an average density of at least 40 persons per km<sup>2</sup>, are growing four times faster than urban areas. They expand at a rate which would double its area of 48,000 km<sup>2</sup> within 30-50 years. The highest share of peri-urban areas is found in the central axis London – Paris – Frankfurt – Munich – Milan, with the highest concentration in Greater London and the Benelux countries, but also in large parts of Poland as well as Copenhagen / southern Sweden.

### Impacts of urban expansion

There are many impacts associated with such rapid expansion. PLUREL's results show that consumption of agricultural land will continue in all parts of Europe (Figure 1). Amongst the areas with major agricultural importance, the Netherlands, Belgium and the Mediterranean coast of France will face the highest loss of agricultural land area-wide, while in Northern Germany, Poland, and Hungary land consumption occurs in a more scattered pattern. The loss of agricultural land in Northern Scandinavia is caused by afforestation, not urbanisation. Landscape fragmentation is concentrated in the central part of Western Europe, where only small patches of open landscapes remain (Figure 2). With increasing welfare, and changing lifestyle and consumption patterns, urban growth is likely to continue, especially in the conversion regions of South and Central Eastern Europe and in Spain/Portugal.

Other negative consequences of urban sprawl are traffic congestion, decay of downtown areas, unhealthy lifestyles and social segregation. But have also identified positive effects of peri-urbanisation, such as:

- Fulfilment of people's living preferences
- Under smart growth: attractive and competitive urban environments
- Proximity to consumers for local producers and potential for eco-friendly lifestyles
- More life and economic development to rural communities

### Dealing with urbanisation pressures

#### - 7 cases

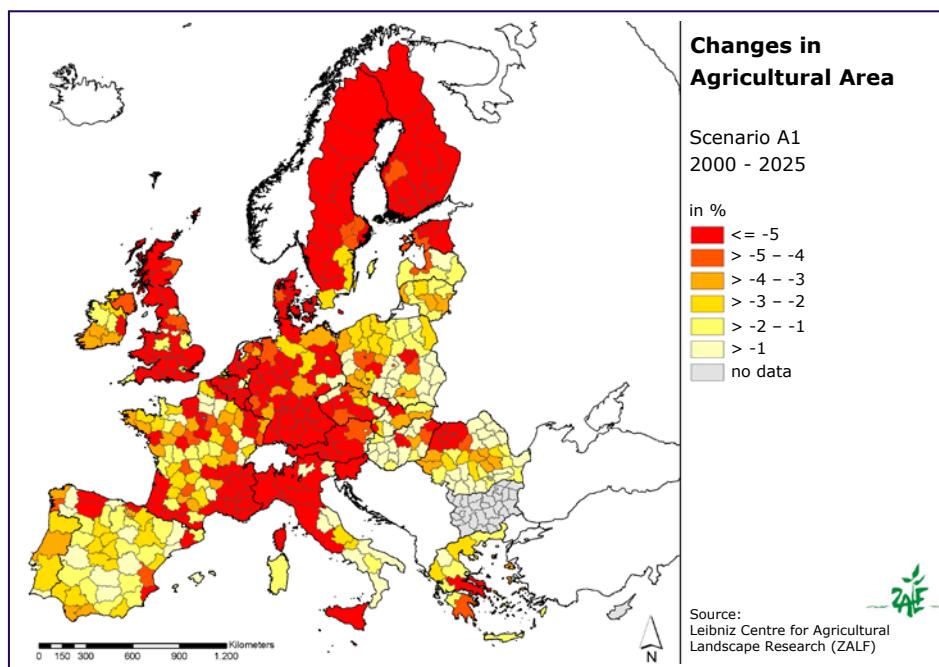
How can sprawl be avoided while these opportunities can be realised? Urbanisation in peri-urban areas causes conflicts between urban, agriculture and nature values. It challenges the distinctions between urban and rural areas as applied in policies and regulations.

The PLUREL project has studied 7 case study regions to find out how pressures towards peri-urban areas can be strategically managed in different development and regulatory contexts.

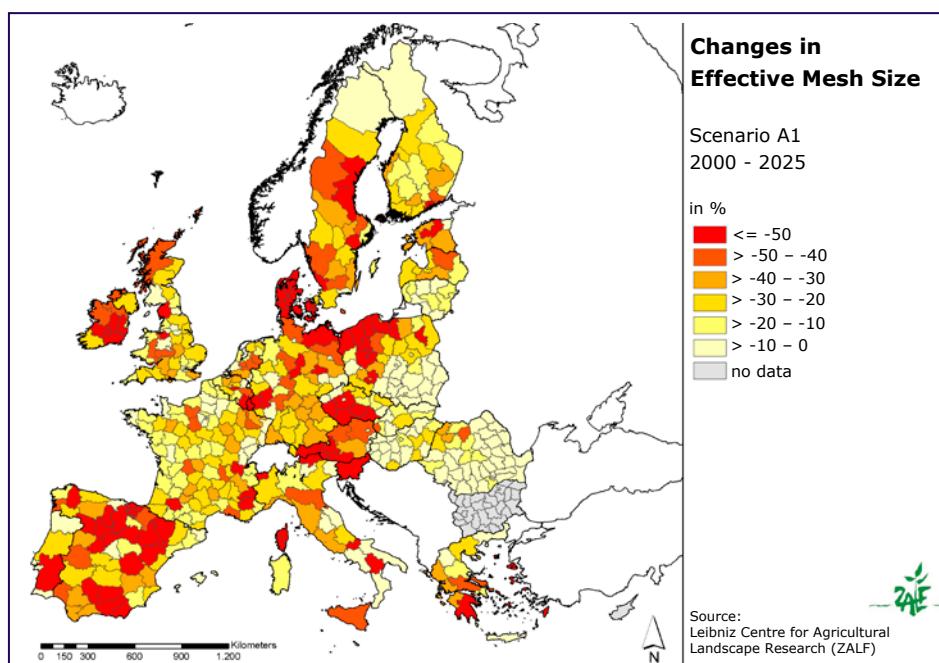
The Hague Region in The Netherlands has high population density and few non-urban surfaces left. The Regional Structure Plan shows the region's main strategies. These include strengthening the relation between spatial planning and transportation, coordination of sectoral ambitions and goals, and offering a base for long-term politically backed-up agreements.

Strategies also include urban compaction and keeping scarce rural areas open by rewarding farmers for their »green and blue services«.

*Figure 1. Consumption of agricultural land in Europe 2000-2025.*



*Figure 2. Landscape fragmentation in Europe 2000-2025.*





Koper



Montpellier



Leipzig-Halle

*Koper* in Slovenia experiences development pressures on the coast while the rural hinterland is in decline. Strategies aim to enhance green recreational areas, supporting tourism-based income in rural areas. Other strategies aim to protect the best agricultural soils that are located in areas under pressure from urbanisation.

*Leipzig-Halle* in Germany is challenged by shrinkage as well as decline of the urban core areas. Strategies focus on landscape conservation and management, including the development of green corridors at the regional scale, linking open spaces and unsealed surfaces to green urban areas. Other strategies comprise inter-municipal cooperation for the protection of the area's floodplains, and a social city programme aiming to make the inner-city more attractive.

The peri-urban areas of the *Greater Manchester* city-region in England host most urban infrastructure, with high levels of urban pressure, pollution, contamination and conflict. Strategies include the Green Belt policy as well as a holistic approach towards green infrastructure including community forestry, climate adaptation, and local food schemes.

The *Montpellier Agglomeration* has dense urban centres, vineyards and significant urbanisation pressures due to the highest demographic growth rate in France. Strategies include the Scheme for Territorial Cohesion (SCoT) which focuses on spatial development scenarios and cooperation between authorities. Landscape elements such as urban agriculture are seen as assets striving for a new balance between nature protection and urbanisation.

The *Warsaw Metropolitan Area*, Poland is characterised by pressure on high-value nature and agricultural areas due to high growth rates and uncontrolled suburbanisation. Strategies aim to coordinate development at the regional level of the Mazovian region to protect natural areas, and to enhance a more polycentric spatial development in order to relieve the pressure on the capital.

The Chinese city of *Hangzhou* is located in the southern part of the Yangtze River Delta. The population is growing at an average 5 % per year which results in continuous urban expansion. This has also made land-use efficiency as well as nature protection key themes for urban development.

Regional strategies include the combination of ecological restoration and controlled urban growth, landscape and ecosystem restoration, and tourism and recreation projects. Also envisaged are new development areas where housing and intensive business facilities are given high accessibility by transport networks.

#### Towards more sustainable urban-urban futures

To summarise, the following regional strategies have been identified as important steps towards more sustainable urban-rural futures:

- Better coordination between transport, land use and open space planning
- Good governance and integrated policy approaches
- Urban containment by conservation and densification
- Development of a Green Compact City with attractive inner-city areas

- Preservation of a green infrastructure for biodiversity and healthy transport
- Promotion of local production and short circuits
- Provision of ecosystem services in the peri-urban landscape

The ability to resist the push of market actors towards more urban sprawl are depending on the strength of the planning instruments, as well as on which governmental level land use decisions are taken. The more decentralised the system and the more laissez-faire oriented the policy, the weaker is the steering potential. A comparison between the case study regions of PLUREL shows that the Hague Region has the largest potential to control urban development, followed by Manchester and Montpellier, while East European city regions such as Warsaw and Koper have changed from a centralised to a more liberal system where the market has more freedom.

A better balanced and sustainable development requires more policy attention for the urban-rural interface at the regional level. There is also need, however, for a new agenda for EU policies and funds with any linkage to spatial development. When it comes to policy-making, the time has come to challenge the historic distinction between urban and rural issues. Instead, we need a more holistic, territorially-oriented perspective to shape future EU agricultural and structural policies.

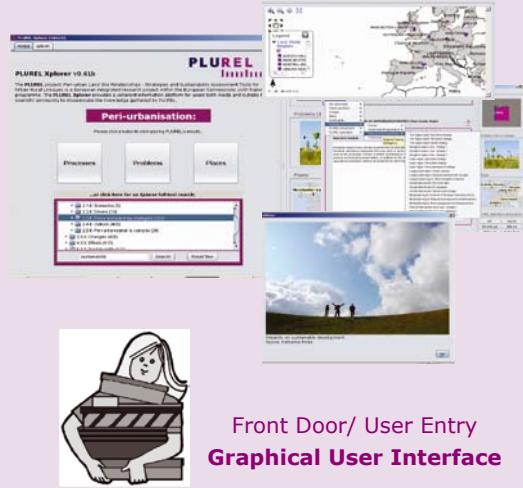
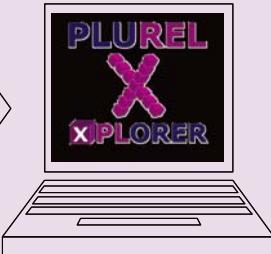
*Kjell Nilsson & Thomas Sick Nielsen,  
Forest & Landscape, University of  
Copenhagen, respectively coordinator  
and project manager of PLUREL*

# PLUREL Xplorer

- the information platform for rural-urban land use relationships



Back Door/ Supplier Entry  
Fact Sheet Upload



Front Door/ User Entry  
Graphical User Interface

**It is challenging to plan and control urban development. How might climate change affect land uses in the urban-rural interface? What might be future pressures of peri-urbanisation? How will people value agricultural farming in the rural hinterland? Will there be enough water for growing urban agglomerations? What about biodiversity and ecosystem services? Are there best practice examples for sustainable peri-urbanisation?**

**Foresight questions like these are addressed by the PLUREL Xplorer, a web-based information platform.**

The changing nature of the relationship between rural and urban land uses has far-reaching consequences for human quality of life and for the environment. To understand these changes as well as the impacts on sustainable development, we need to improve our knowledge and create better assessment tools.

Knowledge management and transfer is a necessary step to identify effective strategies for planning and decision making. PLUREL Xplorer condenses and configures the knowledge and various products of PLUREL into a form that supports planning and policy discussions on rural-urban land use interactions at

European and regional level. It provides information for planners, practitioners and professionals on processes, problems and places of peri-urbanisation in Europe and its regions.

#### Front door for easy access

PLUREL Xplorer's front door (user entry) features a modular design similar to the apps system. Here, short and illustrated fact sheets guide the user through the knowledge bits. They allow for the immediate download of comprehensive background information in the form of reports, figures, maps or sketches.

Interactive design elements support the intuitive comprehension of causal inter-relations between the knowledge bits. The user entry offers three different perspectives on peri-urbanisation. Principles and Processes is the holistic approach comprising all products, interlinked in an analytical chain.

The Problems category comprises the thematic perspective, while Places displays spatially explicit results of PLUREL from the European down to the case study level. Interactive simulations are interlinked and allow for the exploration of land use strategies, policy impacts and the respective land use changes within the boundaries of the underlying models, following an end-user query.

#### Back door for metadata and standardisation

The back door (supplier entry) takes the form of a web-based fact sheet and file upload system that collects content and meta-information of knowledge produced in PLUREL in a consistent and standardised form. This standardisation also allows for the extension to other knowledge sources of rural-urban interactions in Europe, its sub-regions or abroad. The engine itself is developed as a Java Client-Server application using Java WebStart technologies for front door applications, and Java Servlets and JDBC database connectors for back door functionalities. This way, the system is platform independent. Through its arrangement of front and back door, the PLUREL Xplorer is both the result and knowledge dissemination platform of PLUREL, as well as a starting point for a portal on peri-urbanisation.

Visit PLUREL Xplorer at [www.plurel.net](http://www.plurel.net) and explore processes, patterns and places of peri-urbanisation!

*Katharina Fricke<sup>1</sup>, Katharina Helming<sup>1</sup>, J.-Martin Hecker<sup>1</sup>, Jan Peters-Anders<sup>2</sup>, Wolfgang Loibl<sup>2</sup>*

<sup>1)</sup> ZALF, Leibniz-Centre for Agricultural Landscape Research, Muencheberg

<sup>2)</sup> Austrian Institute of Technology, Vienna

# A stakeholder view of PLUREL

**The PLUREL project is drawing to a close, after generating a large amount of activities and outputs. But how do stakeholders look back at PLUREL and its results? This article presents the views of Marcel Houtzager (Netherlands), Tomasz Slawinski (Poland) and Pam Warhurst (UK).**

*PLUREL is now approaching its completion. Looking back, what do you see as the most important outcomes of the project, from your stakeholder perspective?*

**Marcel Houtzager (MH):** PLUREL has provided insight into the processes of peri-urbanisation and the impact of different factors on these processes. We also learnt a lot about trends, risks and potentials for peri-urban regions, while recommendations were made for targeted policies and new concepts for strengthening urban-rural linkages.

**Tomasz Slawinski (TS):** It has been made very clear that peri-urban problems should be seen in an international and even global context. Cooperation with researchers also triggered discussions amongst us practitioners and politicians about peri-urban development policy, challenges and problems. Bringing together new ideas and tools with the practice of spatial planning proved once again that we need to give equal attention to institutional arrangements and planning instruments.

**Pam Warhurst (PW):** For me, it has been incredibly important to impress on academics the importance of making the work they do and its outcomes relevant and understandable for those that deliver or implement policy.

*How has your own region been affected?*

**MH:** We were provided with a series of useful products, including an analysis of land use patterns in the region, scenarios and urbanisation models.

**TS:** For our region, PLUREL's tool for forecasting the area's development as prepared in Metronamica (Moland) was the most important outcome. My team and I have used this tool for various presentations and discussions.

**MH:** A specific study I found one particularly valuable for our region was the evaluation of green space value and appreciation of green space by residents in cities and their surroundings. Research on peri-urban recreational patterns by expats and residents of foreign origin in our region was also useful. Moreover, we found support for our policy of densification in the various studies carried out by PLUREL researchers.

**PW:** Being a part of a transnational programme has helped broaden the minds of our own partners in the South Pennines, to see their work in the peri-urban fringe

as something of concern Europe wide. Also the ideas coming from the policy booklet around governance models have been very interesting and pertinent to our needs in the future. But it is too early to say anything more about its impact on our own work.

**TS:** The close collaboration with the team of researchers from the Polish Academy of Sciences has been excellent. They provided us with new perspectives on the future development of the Warsaw metropolitan area.

*Could you mention a very good personal experience from the project?*

**PW:** The final conference in Copenhagen included some brilliant presentations particularly from Northumbria University around delivering sustainable outcomes. This was very much of interest because landscapes such as the South Pennines are sustainability test beds for the places within and around them. Also, the work of Ivan Tosics on policy changes needed, Common Agricultural Policy and other areas was excellent.

**TS:** There were too many good experiences to mention. Many of these were related to presentations and discussions during meetings, as well as during excursions. Personally I really appreciated the socio-spatial analyses and Joe Ravetz's way of visualising concepts and issues.

>>

## About the interviewees

**Marcel Houtzager** serves as Regional Portfolio Holder, Green, Recreation and Tourism for The Hague Region, The Netherlands. Houtzager is also Deputy Mayor in one of the region's municipalities, Leidschendam-Voorburg. He has served on PLUREL's Board of Stakeholders, representing politically-elected officials.

**Pam Warhurst** chairs a public/private partnership, Pennine Prospects, seeking to raise profile and opportunities for investment in the sub region of The South Pennines. The South Pennines area is a case study for Manchester University, one of the PLUREL partners. Warhurst is also chair of Great Britain's Forestry Commission.

**Tomasz Slawinski** is deputy director of the Mazovian Office for Regional Planning which is responsible for preparing the Warsaw Metropolitan Area spatial development plan. Slawinski has chaired PLUREL's Board of Stakeholders, where he also represented the planner and civil servant community.



PHOTO: SUCCO VAN GRIEKEN

*Marcel Houtzager.*

**MH:** I liked the joint meetings with the practitioners from the PURPLE network. Also highly appreciated were the discussions with my fellow political representatives during our visits and the PLUREL conference in The Hague region. For the latter, I invited politicians and elected representatives from the case regions, so that we had the opportunity to discuss peri-urbanisation.

*What have been the challenges faced within PLUREL in terms of getting scientists and stakeholders / end users to work together?*

**MH:** There were many challenges to be dealt with, including those associated with different languages, different approaches to planning, and different priorities.

**PW:** Getting people to understand each other's needs and disciplines has obviously not been easy. At the beginning things were actually rather bad.

**MH:** It is crucial that research takes into account the applicability of its end products, the specific demands of policy-makers, and the setting of politically-driven decision making. The agenda of research is much more fixed than that of policy-makers. Science and practice have to adjust to each other and reach consensus in the end.

**PW:** I do think many academics would still prefer to be left alone to do their studies, without thinking of the application.

**TS:** Our role was to demand a lot from



*Pam Warhurst.*

researchers, bringing them down from the »academic clouds« when needed, while we had to be ready to learn about new methods and ideas provided by the researchers. A challenge was to understand the level of generalisation of scientific findings and data, sometimes having to sacrifice local details for the benefit of wider results.

*How were these challenges dealt with?*

**PW:** The firm direction from Europe coupled with Thomas Nielsen's determination and skill has moved us much closer to a shared respect and understanding.

**MH:** Challenges were handled through very intensive communication with project management at the University of Copenhagen. Both Kjell Nilsson and Thomas helped during difficult times, solving problems and continuing to look forward.

**TS:** It was very useful to mix end users with researchers in terms of having a close dialogue between actual problems and the search for solutions.

**MH:** For future projects, science and practice can work closer together, for example by involving practitioners already while preparing proposals, so that focus is relevant research questions and practically applicable goals.

*How can we make sure that PLUREL's results are implemented across Europe, at different levels?*

**TS:** We need to make sure that PLUREL's results are disseminated through books



*Tomasz Slawinski.*

and brochures translated into different languages. Moreover, as participants we need to remember to give credit to PLUREL and its results in our future publications.

**MH:** Results need to be made known to all European regions, to national governments and to relevant organisations, including NGOs and professional organisations. These can then use the project's recommendations, scenarios and so forth for taking better decisions and developing better policy for peri-urban regions.

**PW:** For those people who believe this important enough, it would be great to take several outcomes or recommendations from the work and track their implementation over time. I think the progress made in helping us work together should not be lost and perhaps there is another piece of work to be done around governance, rethinking policy for sustainable outcomes in a world where localism is increasingly important, tracking the growth of the power of civil society in getting the best from the peri-urban areas. Maybe even looking at whether green belts and the like can still serve us well when we look at defining them by their functionality rather than a firm boundary.

**MH:** The ultimate goal of future decisions should be to preserve as much open green space as we can, keeping peri-urban regions open and green, rich in biodiversity, economically viable and socially balanced. This will help ensure a high quality of life both for the cities and their surroundings!

*Cecil C. Konijnendijk, editor*

# PLUREL toolbox

**PLUREL provide tools and publications that allow users to explore the sustainability of peri-urban land use relationships, and to gain insight into the challenges facing Europe and its regions.**

## Interactive Impact Analysis Tool

This tool allows the user to explore and compare future situations in cities and the impact of land use changes upon sustainability. The tool targets the dynamics of urban, peri-urban and rural areas, differences between European regions, as well as different future scenarios for land use change.

In addition to exploration of possible futures the tool is intended to support the identification of future political topics and agendas in Europe. It also aims to provide an information base for European stakeholders within the different policy fields.

## MOLAND-Light

MOLAND-Light is an online tool for exploring planning options in European regions. It responds to a request by stakeholders to interact more directly with, and to iteratively modify the results. MOLAND-Light is a simplified version of the MOLAND land use model. It provides online access to land use modeling for all regions in Europe based on common European datasets such as the Corine land cover maps. With this tool European stakeholders can modify scenario settings for their own region to produce rough scenarios for land use change.

## QOL SIM: Quality of Life simulator

This tool addresses a very important topic for the understanding of peri-urban –

urban land use relationships. Based on data PLUREL has assembled from a wide variety of European contexts it allows the user to study and compare social indicators reflecting how land use change affects the quality of life of urban, peri-urban rural residents. Questions addressed include: How do residents perceive their quality of life? what aspects of it are most important to them? and importantly, how do people's quality of life perceptions affect their residential choice behaviour?

## Book and synthesis report

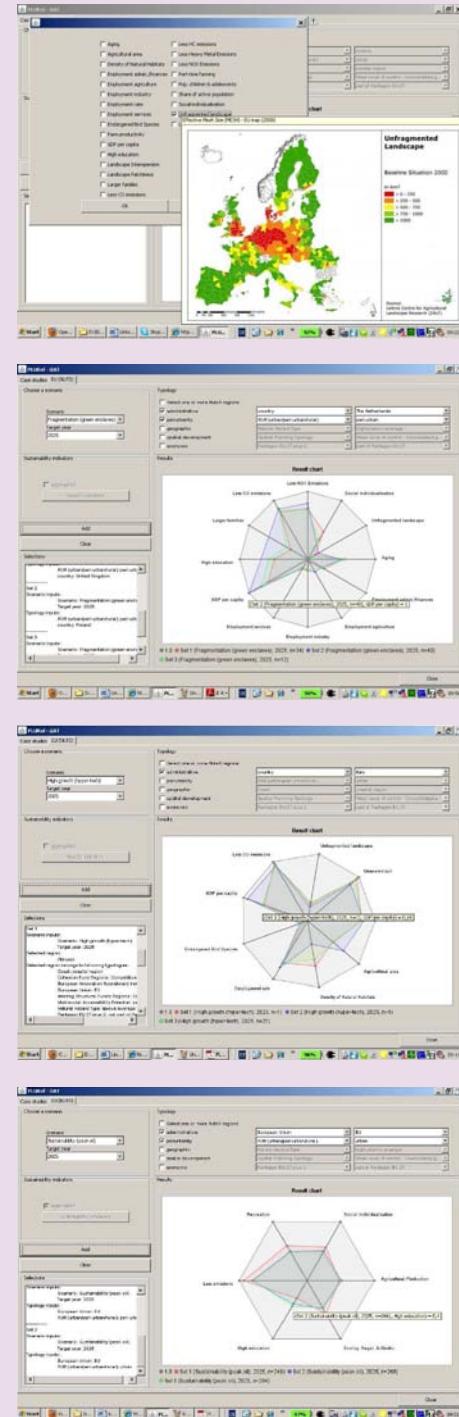
PLUREL's online tools are supported by two printed publications. These address the regional level and the lessons from the case studies, as well as the European perspective and the challenge to European policy.

The book *Peri-urban futures: land use and sustainability* is scheduled for publication by Springer in 2011. It will present in-depth material from the case studies as well as a »cross-reading« of strategies and policy directions for sustainability.

The synthesis report *Peri-urbanisation in Europe: Towards a European Policy to Sustain Urban-Rural Futures* (to be realised during early 2011) addresses peri-urbanisation as a European issue, considering European policy agendas and new directions for sustainable development in rural-urban Europe.

Access tools through PLUREL XPLORER or [www.plurel.net](http://www.plurel.net).

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## Peri-urban Land Use Relationships

*Strategies and Sustainability Assessment Tools  
for Urban-Rural Linkages*

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