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 km², are growing four times faster than urban areas. They expand at a rate which would double its area of 48,000 km² 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«.

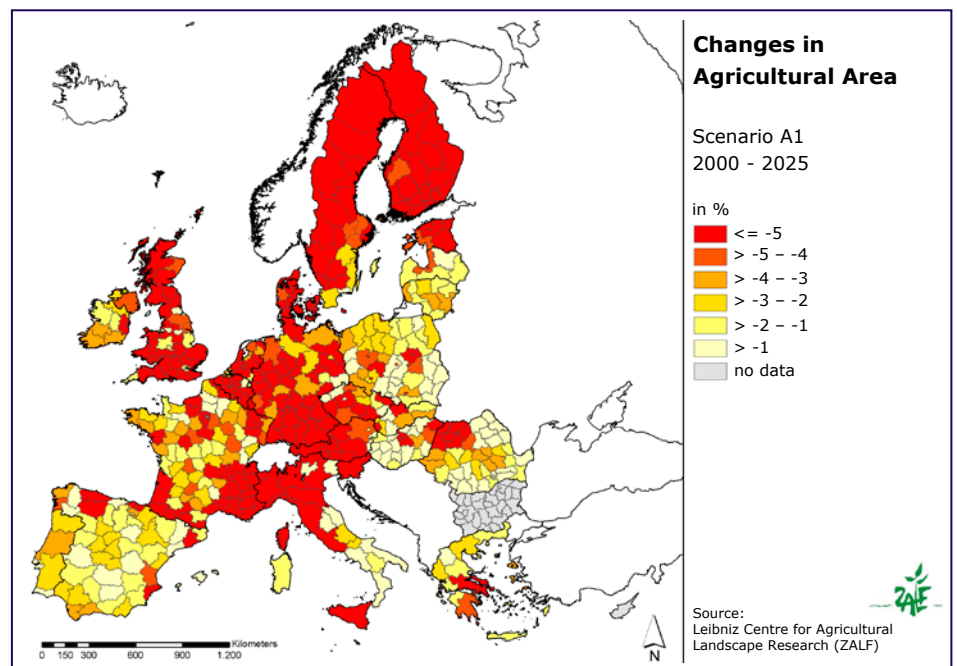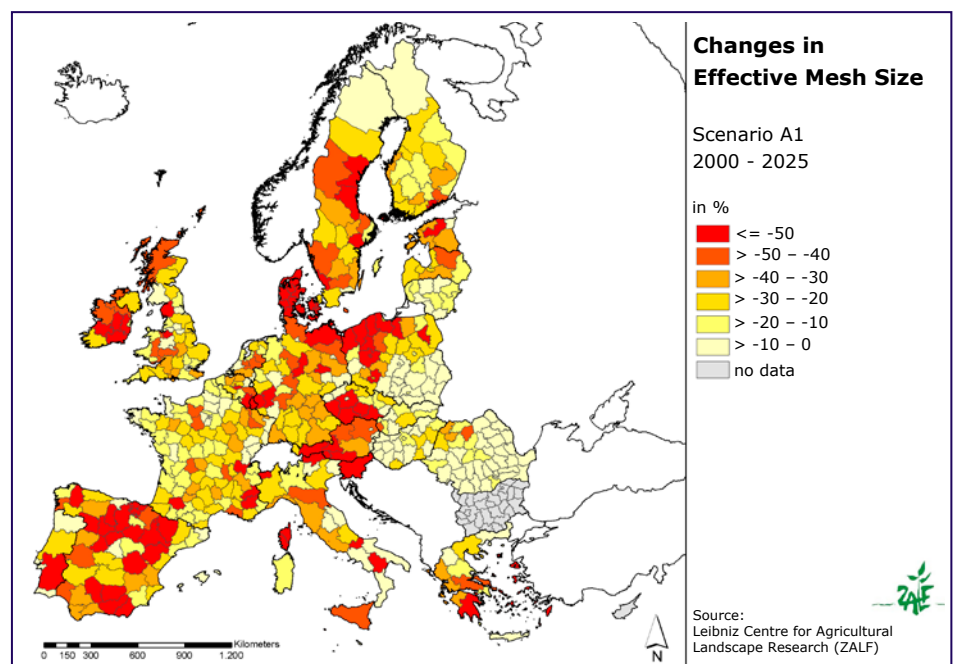*Figure 1. Consumption of agricultural land in Europe 2000-2025.*

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 Mozovian 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
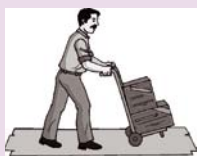• Provision of ecosystem services in the peri-urban landscape

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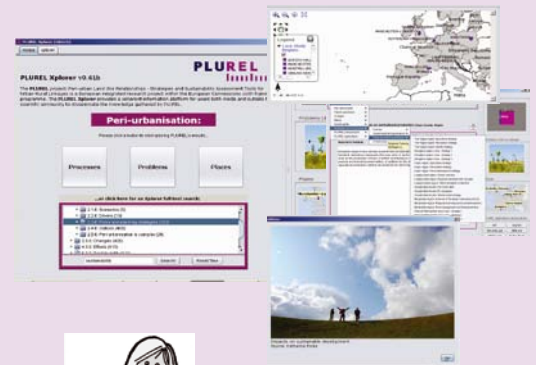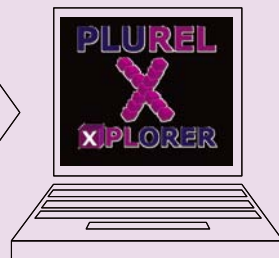
Kjell Nilsson & Thomas Sick Nielsen, Forest & Landscape, University of Copenhagen, respectively coordinator and project manager of PLUREL

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 condensates 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 and explore processes, patterns and places of peri-urbanisation!

Katharina Fricke [1], Katharina Helming [1], J.-Martin Hecker [1], Jan Peters-Anders [2], Wolfgang Loibl [2]
[1] ZALF, Leibniz-Centre for Agricultural Landscape Research, Muencheberg
[2] 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 it's 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 Slawinksi is deputy director of the Mazovian Office for Regional Planning which is responsible for preparing the Warsaw Metropolitan Area spatial development plan. Slawiniski has chaired PLUREL's Board of Stakeholders, where he also represented the planner and civil servant community.

Photo: Sicco 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 worker 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 Slawinksi.

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 chance 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?
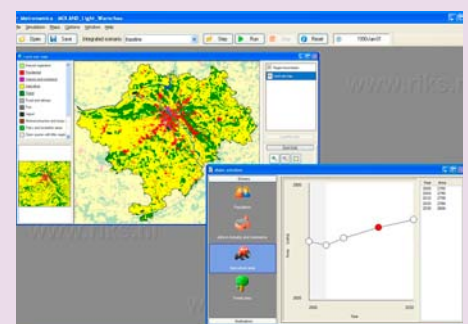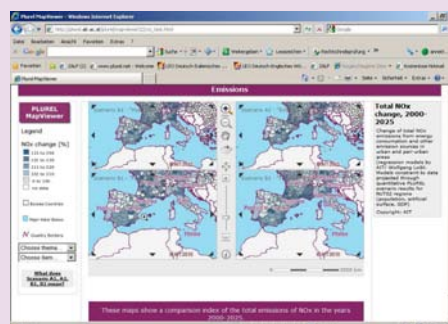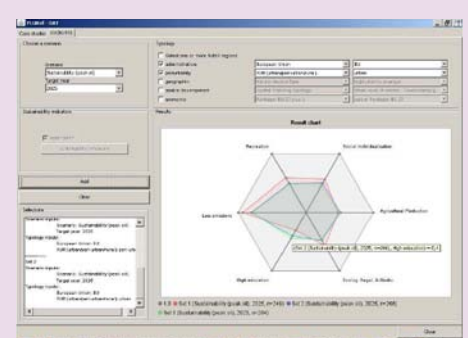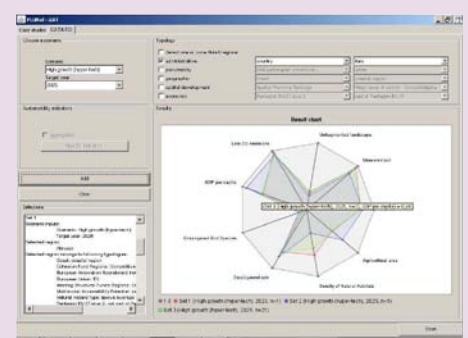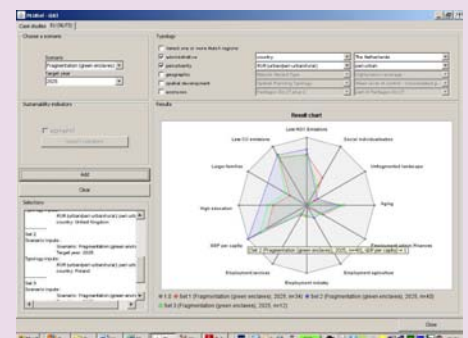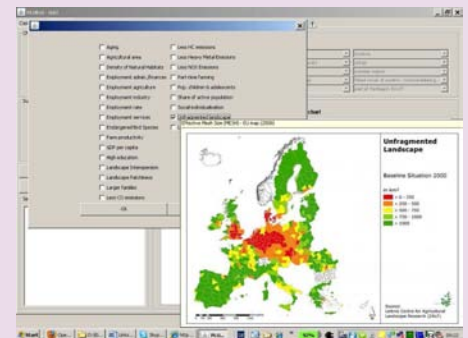
Book and synthesis report

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.

Thomas Sick Nielsen & Kjell Nilsson, Forest & Landscape, University of Copenhagen

PLU REL

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 Assesment Tools for Urban-Rural Linkages

www.plurel.net