

A Typology and evolution of land use competition figures in peri-urban and rural areas

Camille Ollivier, André Torre, Ségolène Darly

UMR SAD-APT

INRA, Agroparistech

University Paris Saclay

Extended abstract

Changes in rural development paths are currently leading to an increasing diversity of stakeholders, activities and interests (Knickel and renting, 2000). This diversification raises concerns in terms of land use management (Schöber et al. 2010; ESPON 2012), and leads the European Commission to emphasize the needs for preserving land (European Commision, 2011) when managing land uses. **In this paper we propose a new typology of land use competition in peri-urban and rural areas, based on Corine Land cover and other data, and its evolution during the last 20 years.**

Land uses changes are provoked by global shaping forces, as urbanization trend, globalization processes, or demographic growth, (Lambin et al. 2003). It induces that some figures of land changes are common across the world, like the continuous soil sealing due to the urban expansion (Foley 2005). Nevertheless, land use changes are also dependant on more localized drivers: national, regional and local governance, institutional capacities, local biophysical conditions among others (Smith et al. 2010). In 2011, Woods supports the idea that globalisation is not necessarily an homogenising process, and the outcomes of it will be different in each locality (Woods & McDonagh 2011). This approach is applicable for the land use dynamics, and the ESPON report on land use changes occurring between 1990 and 2006 assessed indeed several land use dynamics among the European regions (ESPON 2012). **Consequently, we presume a lack of standardization or homogenization of spaces and territorial dynamics and their diversity, due to the interaction between multi-scale processes.**

Nevertheless, common challenges are appearing for the European countries. The soil sealing induced by the urbanization is neither localized to only the major urban centers nor impacting all rural areas (European Environment Agency 2006). Within the Common Agricultural Policy

framework, the farmland evolution is a shared issue, both regarding the dynamic of farmland abandonment due to urban expansion or due to rural marginalization (van Vliet et al. 2015). Similarly, the environmental quality and continuity cannot be only thought at the local scale. It is thus necessary to develop a comprehensive understanding of land use changes in Europe, integrating the local diversity but also revealing the major challenges faced by the European Union.

We present here an analysis implemented at the regional level, which is also the level of implementation of the European regional development policies. The European policy intends to enhance the social and territorial cohesion, while supporting the economic development (European Commission, 2010) through the smart development policies, part of the European 2020 development strategy. The smart specialisation principle consists in identifying the unique characteristics and assets of the regions, in order to highlight their regional competitive advantages (Naldi et al. 2015). The necessity of not developing one-fits-at-all regional policy models is crucial to implement this smart specialisation strategy, through place-based and knowledge-based policies. **Land uses are impacted by the regional development trajectories, and will also condition the potential for development.**

Multiple land uses are competing for space and resource access (Lambin & Meyfroidt 2014). Furthermore, the diversification induces multiples stakeholders and interests related to land uses, affecting territorial governance (Torre et al. 2014). It can be source of tensions or conflicts, but also induce associations of uses to create, at the regional level, positive effects on the regional social and economic context (Knickel & Renting 2000). Cohesion between activities is thus becoming a crucial element for rural development (Ploeg et al. 2000). Consequently, the rural localities are facing various types of challenges and possess specific resources they can use to overcome them.

Our analysis is based on two hypotheses: **1) the geographical proximity between land uses is source of potential competition, which is a challenge to overcome at the regional level; 2) the co-existence between land uses will support the valorisation of regional peculiarities.**

The first task has been to identify the land uses which are interacting in Europe. Therefore, we conducted a literature review on the main land uses in Europe, highlighting the potential for competition and synergy. Then, to regionalize the issues in terms of land use management,

we studied the spatial location of these interactions within Europe based on the Corine Land Cover Dataset for the 1990 - 2012. Period. Our study was implemented at the NUTS 2/3 level (method from Helming et al., 2008) and resulted in a **typology of land use competition figures in peri-urban and rural areas, which we would like to present and discuss in this communication.**

Our analysis reveals, among other results, a continuous decrease of farmland and natural land in some regions. However, the dynamics can be decreasing or just starting, intensive or affecting small surfaces, and the conversion of forest is dependant of the regional context (availability of farmland, topography, protection of forested areas). The farming practices do not impact much natural land, but these are not expanding either in highly cultivated regions. Furthermore, a large part of the European Union is not really competing for land, since dynamics of farmland withdrawal and forest regrowth are observed. However, once again, evolutions are modifying this pattern occurring between 1990 and 2012.

A common approach for regional development studies is to differentiate European region based on the urban-rural gradient, like the Dijkstra-Poelman typology, which is based on the regional population density and the proximity to a city (Copus et al. 2011). This approach can be useful for assessing regional socio-economic disparities. However, our results suggest that this static approach can benefit from a dynamic complementary approach. The urban proximity impacts the land use changes patterns, but the diverse urban expansion dynamics are also a key element of differentiation. Despite that the urban-rural gradient is visible in the typology, the land use dynamics are not following only an urban-rural gradient, and the impact of this gradient is evolving through time. An opposition between the western European and eastern European countries is also present but once again it impacts variously land use dynamics through time. Furthermore, regional peculiarities are identified.

Using this typology, we finally aimed at identifying key land use management issues and opportunities at the regional level, based on a cross-analysis between the land use changes regional typology and socio-economic indicators, and mobilizing the literature review results. Based on the smart development theoretical framework, we suppose that a smart land use management should identify needs in re-orientation strategy to jointly avoid too much land use competition, and to support land use synergies. Consequently, we identified for each regional profile some specific land competition issues and land use synergies potential. It leads

us to question what is the appropriate scale of a smart land use management, for which we will present some elements of discussion.

Bibliography

- Copus, A. et al., 2011. *EDORA: European Development Opportunities for Rural Areas*, ESPON, 2012. *EU-LUPA European Land Use Pattern* Version 06. ESPON & TECNALIA Research & Innovation, Luxembourg, 674p.
- European Commission, 2010. Europe 2020: a European Strategy for Smart, Sustainable and Inclusive Growth, European Commission, Brussels.
- European Commission, 2011. Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions Roadmap to a Resource Efficient Europe, COM/2011/0571 final.
- European Environment Agency, 2006. *Urban sprawl in Europe - The ignored challenge*, Available at: <http://eprints.uwe.ac.uk/10295/>.
- Foley, J.A., 2005. Global Consequences of Land Use. *Science*, 309(5734), pp.570–574. Available at: <http://www.sciencemag.org/cgi/doi/10.1126/science.1111772>.
- Helming, K., Pérez-Soba, M., and Tabbush, P. (eds), 2008. Sustainability Impact Assessment of Land Use Changes, Springer-Verlag Berlin Heidelberg, p508.
- Knickel, K. & Renting, H., 2000. Methodological and conceptual issues in the study of multifunctionality and rural development. *Sociologia Ruralis*, 40(4), pp.512–528.
- Lambin, E.F., Geist, H.J. & Lepers, E., 2003. Dynamics of land-use change in tropical regions. *Annual Review of Environment and Resources*, 28(1), pp.205–241. Available at: <http://www.annualreviews.org/doi/10.1146/annurev.energy.28.050302.105459>.
- Lambin, E.F. & Meyfroidt, P., 2014. *Trends in Global Land-Use Competition* K. C. Seto & A. Reenberg, eds., Cambridge: Mit Press.
- Naldi, L. et al., 2015. What is smart rural development? *Journal of Rural Studies*, 40, pp.90–101.
- Ploeg, J.D. van der et al., 2000. Rural Development: From Practices and Policies towards Theory. *Sociologia Ruralis*, 40. Jg., H(4), pp.392–408.
- Schöber, B., Helming, K. & Wiggering, H., 2010. Assessing land use change impacts – a comparison of the SENSOR land use function approach with other frameworks. *Journal of Land Use Science*, 5(2), pp.159–178.
- Smith, P. et al., 2010. Competition for land. *Phil Trans R Soc*, 365, pp.2941–2957.
- Torre, A. et al., 2014. Identifying and measuring land-use and proximity conflicts: methods and identification. *SpringerPlus*, 3, p.85. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3942560&tool=pmcentrez&rendertype=abstract>.

Van Vliet, J. et al., 2015. Manifestations and underlying drivers of agricultural land use change in Europe. *Landscape and Urban Planning*, 133, pp.24–36.

Woods, M. & McDonagh, J., 2011. Rural Europe and the world: Globalization and rural development (Editorial). *European Countryside*, 3(3), pp.153–163.