

Beyond land use: what does it take to evaluate the territorial implications of European policies?

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Extended abstract

As pointed out by the OECD regional outlooks since 2011, the number of socio-economic trends requiring a better integration of the sub-national spatial dimension into broader (economy-wide) strategies or policies has been increasing. Moving away from only looking at Gross Domestic Product (GDP) and productivity growth, the recent focus is increasingly on the level of development and well-being (current and potential) associated with regions and cities. Well-being is an intrinsically local concept (OECD, 2014) and multi-faceted in nature: it is determined not only by available income, but also by the quality of the surrounding natural and social environment (measured by, for example, air pollution levels, life expectancy and safety).

The question of “place” and “territory” has thus been newly raised in recent years from a variety of perspectives, in an attempt to understand the source of the differentiation of local development patterns. “Territorial development” is often used to describe the patterns of development of specific portions of territory (EC, 2011). These territorial units are typically comprised of sub-national areas such as urban, metropolitan, regional or rural jurisdictions, but they can also embody spatial contexts that can be differentiated from their surroundings such as islands, coastal or mountainous areas. The concept of territorial capital has been defined to describe the system of territorial assets of economic, cultural, social and environmental nature that determines the development potential of places (OECD, 2001; Perucca, 2013). In this context, the socio-economic performance of a region can be interpreted as an endogenous process based on its specific territorial capital, that can however be influenced by the pervasive characteristics of the national economy and government in which the region is embedded (Camagni and Capello, 2010).

Territorial cohesion has been recognised as one of the key aspects in achieving the targets of the Europe 2020 strategy (EC, 2011). Better integration and coordination of policy instruments with a territorial dimension is, therefore, necessary to secure the successful implementation of the Europe 2020 strategy across the various cities and regions of the EU (Böhme et al., 2011).

The function given to land is both influenced by and impacts greatly on a multitude of factors, economic, social, environmental and political alike. Analysing the situation with a territorial approach helps to break

down and understand these complex interactions, so capturing both the specific characteristics of a spatial context, and its relations with other contexts of the same geographical level (e.g. regions) or at higher aggregation levels (e.g. countries). In such a way, local policies can be designed which take into account and target the specificities of a territory, whilst keeping in mind the broader context.

As support activities to the practices of policy definition and evaluation, “territorial approaches” identify a large family of methods, more or less sophisticated, whose main strength is the ability to analyse a wide range of thematic areas across different spatial scales. These are the basic requirements for a tool to effectively support policies that aim at increasing the well-being of regions and cities. As such, spatially explicit land-use models proved themselves as useful tools to inform policies (Koomen & Borsboom-van Beurden 2011). This is confirmed in the continuous effort of the EC-DG JRC to develop the LUISA territorial modelling platform.

LUISA is a pan-European dynamic spatial modelling platform specifically designed to assess regional and local impacts of European policies and trends. The platform allocates (in space and time) the demand and supply of resources (biotic and abiotic, including primary energy resources), the settlement of socio-economic activities (e.g. housing, industry, services, touristic accommodations, etc.) and infrastructures (e.g. for transport, energy, etc.).

The allocation of population, economic activities and resources is driven by a combination of factors, including, amongst others, biophysical suitability, policy targets and regulatory constraints and economic criteria. The projected territorial patterns cover all EU member states, EFTA and Western Balkan countries at a detailed geographical resolution (100m), typically from the base year 2012 until 2050.

The LUISA modelling platform relies on inputs from several external models, thus being a truly integrative tool that coherently links specialised macroeconomic, demographic and geospatial models with thematic spatial databases. These features allow LUISA to incorporate complex interactions among human activities that are location-specific and their determinants, translating socio-economic trends and policy scenarios into processes of territorial development.

LUISA is typically configured to project a reference (or baseline) scenario, assuming official socio-economic trends, business as usual preferences and the effect of established European policies with direct and/or indirect territorial impacts (see e.g. Baranzelli et al., 2014; Lavalle et al., 2013). The latest baseline scenario is the Territorial Reference Scenario 2017, which also intrinsically takes into account several policy implications, including the Renewable Energy Directive, the Trans-European Transport Network (TEN-T) policy, the Nitrate Directive, The Common Agricultural Policy, the EU Biodiversity strategy to 2020 and protection of Natura2000 areas. Variations to the reference scenario may then be used to estimate impacts of specific policies, or of alternative macro-assumptions.

The final output of LUISA is in the form of a set of spatially explicit indicators that can be grouped according to specific themes and be represented at various geographical levels (national, regional or others). Given its highly flexible and customisable structure, LUISA has the ability to integrate within a unique modelling framework the territorial capital factors that influence the spatial patterns of socio-economic activities and population distribution at different scales. LUISA is therefore a well-suited tool for impact assessment of a wide range of policies with territorial dimension, including their potential synergies, conflicts and trade-offs.

The LUISA platform goes beyond the traditional modelling of land cover/use change in that, using a territorial approach, it looks at the functionality of land and the differing intensity levels of use, as well as identifying mixed uses and discerning quality of land in the allocation process. For example, natural habitats under pressure can be identified, or the suitability of certain urban environments for human settlement. As such, the platform integrates a multitude of different spatial scales to simultaneously capture a number of dynamics which move at different spatial scales and along different spatial horizons.

LUISA has been used in many different applications over the years, such as assessing the efficiency of infrastructural investments on the energy system (Baranzelli et al., 2016a; Baranzelli et al., 2016b) and transportation hubs (Jacobs-Crisioni et al., 2016), and the impact of Resource Efficiency Roadmap targets on the uptake of land (Barbosa et al., 2016). Furthermore, LUISA is currently being set up for the production of thematic information for the upcoming 7th Cohesion Report.

The LUISA platform requires an extensive knowledge base that provides detailed information layers on many themes, including transport, energy, housing, economic activities, and natural resources. This information can be especially valuable in understanding the role of tradable services and resource extraction in explaining the difference between catching-up and diverging regions (see OECD, 2016). Resource extraction intensification, while benefitting economic growth, may however generate or exacerbate local conflicts. Knowing where resources, stakeholders, and vulnerable environments are located provides useful insights about these potential conflicts.

For example, in the case of the future development of shale gas as a resource in Poland, the likely exploitation costs and possible associated risks could be quantified using LUISA (Baranzelli et al, 2014; Vandecasteele et al., 2014). In order to do so, the following main factors were taken into account: the current distribution of potential users i.e. who needs the resources, such as production activities; available infrastructures affecting the costs e.g. gas pipelines or transmission grids; and vulnerable areas which might be negatively impacted by the extraction/production activities (i.e. where degradation of human wellbeing or environmental quality was possible, such as water resources; conflicts with human settlements and heritage sites).

With the launch of the New Urban Agenda (NUA, UN-Habitat, 2016) and the Commission's Urban Agenda (http://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/pact-of-amsterdam.pdf), there has been an increasing focus on the importance of cities within the European context. The LUISA platform can be used as a powerful tool in helping to make sense of the dynamics occurring at the urban scale, and in doing so, assist city administrators in working towards sustainable urban development policies. LUISA provides several outputs which can provide important insights into city strengths and weaknesses, and where potential improvements can be made to achieve a high level of well-being for citizens. Themes specifically looked at include demography, urbanisation and housing, education, economic development, transport and accessibility, the natural environment, and resource efficiency.

The capacity of the LUISA platform to identify regional and territorial profiles, would allow governments and policy makers at different levels to build policies on local competitive advantages, thus capturing all the nuances of their territory well beyond the stylised opposition between urban areas and remote rural regions.

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