Global Land Project 2nd Open Science Meeting
Land Transformations: between global challenges and local realities

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This presentation examines linkages between land-use modelling, scenario planning and social learning. Reflecting on collaborative landscape research conducted in France's Reunion Island, it describes an approach to land-use simulation aimed at both exploring future land-use dynamics and facilitating dialogue across institutions. On this 2,500km² tropical island of the Indian Ocean, policymakers and planners must compose with important tensions over land and natural resources. Limitations inherent to insular environments are exacerbated by high population densities (328/km² in average), rapid demographic growth, partly uncontrolled urbanisation, and the inscription of 40% of the territory as UNESCO's World Heritage. Conflicting views and poor coordination between the agricultural, environmental and urban sectors add further challenges to the practice of land-use planning. For instance, agricultural land conversion and uncontrolled urban sprawl can be conceived, depending on actors, as the consequences of urban planners' lack of interest for agriculture and its functions or the reluctance of the agricultural sector to reconsider current land-use policies and models. Within the framework of the Descartes research project, series of contrasted 10-year exploratory scenarios of urbanisation and agricultural change were co-constructed with representatives of a wide range of organisations in order to mediate and advance the debate. Modelling workshops were also organised with selected experts that focused on urban and agricultural dynamics – both planned and uncontrolled – and their role in regulating water quality, runoff and landscape services. More than the design of highly accurate predictive models, emphasis was put on the heuristic and catalytic values of land-use simulations: triggering information exchange, structuring debates, questioning and integrating knowledge on land-use change and interactions. Based on the above scenario planning and modelling activities, land-use simulations were implemented using Ocelet, an open source language dedicated to the modelling of spatial dynamics and the interfacing with GIS data and software. We present here some key research results regarding coupled urban-agricultural simulations. In particular, we discuss how coupled simulations can help exploring land-use interactions and unravelling future conflicts and impacts associated with different land-use scenarios, some of which actually reflect current policies and plans. Building on notions of actor-network and boundary objects, we analyse also how land-use simulations, designed collaboratively and disseminated as dynamic spatial data, can contribute to reshape individual perspectives and actors' interactions. Finally, it is expected that the overall approach and experience will contribute to advance social learning and assist decision-makers and planners towards more sustainable land governance and land-use arrangements.

0412	Geotechnologies for the characterization of coffee agro-environments and their relation to coffee quality in space and time	Helena Maria Ramos Alves, Tatiana Grossi Chquiloff Vieira, Margarete Marin Lordelo Volpato, Marilusa Pinto Coelho Lacerda, Flavio Meira Borem	Brazil

The paper presents the results of a research project that relates the quality of coffee beverage to the environment in a major coffee producing region of Brazil, providing the scientific basis required for obtaining a Protected Designation of Origin for the specialty coffees produced in this region. Coffee has

been historically strategic for Brazilian exports. With an annual production of around 48 million bags and cultivated area estimated at 2 million hectares, the product has ensured the country's first position as a producer and exporter and second position as a consumer in the international market. However, throughout its history, Brazilian coffee has undergone cycles of rise and fall and currently faces a moment of crisis, with low prices that impact primarily the family farms in mountain regions of Minas Gerais, the country's main producing state. In this mountainous landscape, the region of "Serra da Mantiqueira", considered one of the most important regions of specialty coffees in Brazil, which have been achieving growing recognition in the international market, stands out for the high sensory quality of its coffee. This reflects the growing demand for gourmet coffees whose characteristics are related to their geographic origin. In this scenario, in which the productive sector and the market establish a transparent business relationship based on consumer preference and added value depending on the quality of the product, Protected Geographical Indications represent a new production philosophy which is now beginning to be explored in the country. In order for the Serra da Mantiqueira region to benefit from this new perspective of adding value, making its coffee more competitive and sustainable, new technical and scientific information that establish the relationships between the factors that determine coffee quality is required. Geotechnology can have a significant contribution in filling this gap. Coffee is a beverage potentially influenced by its planting site. Environment, genotype and agricultural management create the identity of the drink. Mapping the quality of coffee produced in the region, with the delimitation of homogeneous environments, the *terroirs* with the potential to produce gourmet coffees, to direct agricultural activities and the preservation of natural resources, provides the necessary inputs for the formulation of public policies aimed at stimulating competitiveness and sustainability for the coffee farmers in the 25 municipalities that make up the region.

0414	Land abandonment, urban sprawl and renewable energy as drivres of land-use change in Switzerland: five scenarios for the future	Bronwyn Price, Felix Kienast, Irmi Seidl, Peter Verburg, Christian Ginzler, Janine Bolliger	Switzerland

Socio-economic processes are strong drivers of land-use change across European landscapes. Land abandonment, relating to a decline of agricultural significance, has been a dominant process affecting European landscapes, and in particular mountainous regions such as in Switzerland since the mid 20th century. Urbanisation in Switzerland is increasing at a rapid rate as population increases and, in particular, with increasing demand in living-space per capita. Decrease in public support for nuclear power stations is driving a push towards increased production of renewable energy within Switzerland. These inter-related and sometimes competing processes have significant implications for land-use and patterns of land-use change within Switzerland, yet the extent and location of anticipated land-use changes remain unknown, as does the impact on landscape services. This project defines 5 scenarios of future land-use demands for Switzerland under different projections for urban-sprawl, land abandonment and land use for renewable energy production. Using three time steps of the Swiss Land-Use/Land-Cover Statistics (1985, 1997 and 2009) we mapped and measure past land-use and land-use type transitions. We then modelled the probability of land-use transitions for the whole of Switzerland with respect to a suite of biophysical explanatory variables. Using the Dyna-CLUE land-use change modelling framework (Verburg and Overmars, 2009) we applied the 5 future scenarios to determine and visualize (map) future land-use patterns in a spatially explicit manner. The resulting spatially explicit land-use scenarios will be freely available for download by researchers and policy makers. These scenarios will provide key base information for future work including assessing conflicts and synergies in land-use planning or assessing impacts of land-use change on landscape services. This presentation

Referência bibliográfica

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