

Land-use change scenarios in the European context – Interpreting regional scenarios from global storylines – Mark Rounsevell

The lecture provided us an overview of the land-use scenario methodology. The baseline year was 2000 and the land-use scenarios were constructed for years 2020, 2050 and 2080 based on the four storylines of the Intergovernmental Panel on Climate Change (IPCC). Four different land-use types were chosen: urban, agriculture, forestry and areas protected for nature conservation or recreation.

Methodology of developing scenarios was based on an interpretation of the four storylines according to IPCC (A1F1, A2, B1, B2). Each storyline describes different drivers following the base matrix approach: within this matrix the vertical axis represents a distinction between more economically (A) and more environmentally (B) orientated futures. The horizontal axis represents the range between more globally (1) and more regionally orientated developments (2). The scenarios were developed following by three basic steps:

1. *Qualitative descriptions* of the range and role of different land use change drivers
2. *Quantitative assessments* – total area quantity of each land use tape
3. *Spatial allocation* – specific to each scenario

The land use scenarios are developed to explore possible futures that encompass a range of uncertainties in environmental changes and consider the common present outcomes (e.g. common trend for agriculture land use decline in area or intensity, urbanization increase...).

Limitation and uncertainty: subjective nature of qualitative interpretations; assumption supporting the land use change models; the problem of validating future change scenarios; the quality of the observed baseline and error with statistical downscaling.

Examples were based on VISTA, FRAGILE and REGIS research projects using alternative techniques for the development of regional scenarios.

A rule-based spatial model for simulating land-use change. Model is able to produce a satisfactory prediction over large temporal and spatial scale when based only on a few driving variables for pattern change.

Agent-Based Models of Land-Use and Land-Cover Change. ABM is rule based on approach spatially explicit models of agent's behavior in a topographically explicit landscape wherein they encounter new challenges, incorporating social networks and social interactions. Decision environment is uncertain, behavior is adaptive. Development of regional models is based on aggregate behavior, as expressed through the interplay of market forces, institutions, and demographic structural changes.