



Geospatial analysis of landscape dynamics in response to land use and land cover changes in the Suceava river basin (Romania)

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Changes in land use and land cover represent an important indicator in evaluating the dynamic of landscape (Feranec et al., 2002). Land use change is the result of the interaction of the natural environment and human society and it is also an important manifestation of the ecological environment changes of the earth's surface (Zhou et al., 2011; Liu et al., 2012). The geographical position in Central Europe and its socio-economic and institutional transformations after the fall of socialism in 1989, determines the study area to represent an experimental territory for land use scientists. In the framework of sustainable development, the analysis of landscape dynamic in response to land use and cover changes represent an adequate tool to identify a balance between natural, social and economic dimensions of landscapes in a given territory. The present study aims to analyze the spatial and temporal dynamic of landscape pattern in response to land use and land cover changes in the Suceava river basin, Romania, between 1990 and 2012, by the application of a diachronic analysis of freely available CORINE Land Cover data and GIS techniques. In order to analyze landscape pattern in the studied area, we examined land cover changes and transformations processes (flows) during three different periods with distinctive socio-economic, political, technological and cultural characteristics, that were delimited by several particularities: (1) 1990-2000 (transition period to the market economy); (2) 2000-2006 (pre-accession period to the European Union) and (3) 2006-2012 (post-accession period to the European Union). Results showed the surface that suffered no changes in the entire period (1990-2012) was 1657.13 km², representing 72.65%, while the changed areas represented 623.99 km² (27.35%). The period 2000-2006 was the most dynamic regarding land use and cover changes summing 418.36 km² (67.05% from the entire period and 18.34% from the total study area). The dynamics of land use and cover changes over the three time horizons showed that class represented by heterogeneous agricultural areas was the most dynamic one with 199.25 km² (31.93%), followed by urban fabric class with 114.03 km² (18.27%) and arable land with 76.95 km² (12.31%). Our research on the processes of landscapes transformation showed that the intensification of agriculture have the highest proportion between 1990 and 2012 (157.47 km², representing 25.24%). As change weight over the three periods, the most active period of intensification of agriculture was 2000-2006 (125.60 km², representing 30.02%), as a consequence of adoption and implementation of the Common Agricultural Policies. Secondly, the deforestation had also a high degree (20.47% of total changes between 1990 and 2000), as a consequence of illegal logging by implementing of the Land Reform (Act no. 18/1991), which has ruled a restructuring process and basic mutations in the ownership of land, resulting a high degree of privatization of land, especially. We hope that the present approach will improve the sustainable management of the Suceava river basin, taking into account a future rational use of natural resources adapted to societal needs in a constantly changing world.