

# Effects of global changes on mountain land use patterns and ecosystem services in a comparative case study: Italian Alps and Romanian Carpathians

## Poster Abstract for the IIASA 40<sup>th</sup> Anniversary Conference

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Mountain ecosystems provide diverse ecosystem services with local and global importance. One of the most recognized challenges to sustainable management in mountain areas is the spatial decoupling of provisioning and benefit. In ongoing research, we are conducting a comparative case study of two mountainous regions (Italian Alps and Romanian Carpathians) in order to improve the understanding of the relationships between land use changes and ecosystem services in mountain environments. With this poster, we will present our methodology with preliminary and expected results, and possible suggestions for managing mountain areas. To identify the past trends, we are analyzing land use changes and their drivers in the last 30 years. In developing possible futures scenarios, we are focusing on Representative Concentration Pathways, a new set of emissions pathways that can be translated into climate scenarios, with the accompanying Shared Socio-economic Pathways. To spatially allocate socio-economic scenarios with calculated land use demands, we are using a cellular automata land use change approach, resulting in possible future land use patterns. The main objective of the research is to link mountain ecosystem services to the current and modeled future land use patterns. Therefore, we are developing a set of indicators for the most important ecosystem services and relating them to land use changes in a qualitative matrix. Land use changes in terms of forest growth could result in increased capability of ecosystems to reduce water runoff, however the urbanization of the valley floor and foothills might affect erosion control. As the expected land use changes could have negative feedback effects to the well-being of mountain communities, we believe it is essential to compare possible futures under different scenarios of land use change. This enables us to discuss favorable management options for specific mountain environments.