Abstract

The provision of ecosystem services within social-ecological systems is influenced by multiple environmental and anthropogenic driving forces, affecting natural ecosystems. At the same time, the capacity of ecosystems to concurrently provide different types of ecosystem services is inherently limited. Thus, ecosystem changes and their effect on ecosystem services have direct implications for human existence and well-being.

The aim of this thesis is to present a modelling approach to assess regulating, provisioning and cultural ecosystem services and to quantify their potential trade-offs, illustrated by two case studies carried out in selected UNESCO Biosphere Reserves in the Czech Republic, Třeboň Basin Biosphere Reserve and Šumava Biosphere Reserve. Both of the selected case study areas are characterized by high levels of natural and cultural assets and challenges regarding future landscape management.

In this study, first the social-ecological dynamics within the study areas was analysed by creating participative scenarios through collaboration with local stakeholders, eliciting their preferences regarding future landscape development to 2050. Second, the impact of the scenarios on ecosystem services and their trade-offs were assessed using a combination of spatially explicit models and modelling approaches.

The results indicate that while scenarios promoting economic revenues from landscapes caused substantial trade-offs among ecosystem services, conservational scenarios provided higher levels of ecosystem services with lower trade-offs. This study illustrates that while some stakeholder-created scenarios favoured managing ecosystems for short-term economic revenues, incorporating the provision of ecosystem services and their trade-offs shows that environmentally focused scenarios provide higher long-term benefits.

The conclusions of this study emphasize the importance of assessing ecosystem services trade-offs for sustainable landscape management and well-informed spatial planning and decision-making. At the same time, this study aims to contribute to the development of long-term socio-ecological research (LTSER) in the Czech Republic.