

Trade-offs between ecosystem services under conditions of changing land use: the urban perspective

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In 2009, a *Letter to Nature* argued that “... earth’s disturbed ecosystems have much more to offer than many would give them credit for” (page 435). Little is known so far about these specific *urban ecosystem services*. Since they have been less intensively investigated than those of open land systems we have only limited knowledge to what extent they exist and have been already impaired. Moreover, we do not know how far damages of urban ecosystem services endanger parts of the urban quality of life in general.

Particularly in dense urban areas, ecosystem services may also trade-off against each other either because they often compete for space or because they are causally linked. A crucial challenge thereby is the analysis of trade-offs and interrelations between different ecosystem services such as water regulation, recreation or climate regulation. Ecosystem services are not independent from each other and policies at different spatial levels targeting one specific service may well affect spatio-temporal patterns and provision of others.

In the EU-Project PLUREL (www.plurel.net) we relate land use change in urban regions to both supply of and demand on ecosystem services. Computed changes of ecosystem system supply, respectively, feed back to the drivers of the land use change model. Such feedbacks exist mainly in form of (changes of) behavioural heuristics of stakeholders and policy makers which can be “detected” using social science methods and which are “translated” into model rules. Thus, feedbacks from impaired ecosystems become drivers of land use.

To contribute to the linkage between ecosystem service and land use change modelling research in urban regions, in my paper, I will firstly, draw a trade-off matrix of urban ecosystem services for a case study region of PLUREL and, secondly, uncover potential feedbacks of ecosystem services decline to drivers of urban land use change.

Own references related to the topic:

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