Do we have the tools to assess Nature Based Solutions for climate change mitigation?

Summary

Nature-based solutions provide a way to ensure that current and future human demand for natural resources can be fulfilled also under changing climate. The OPERAs project offers a number of examples for tools and methods supporting the development and implementation of nature-based solutions for effective climate mitigation.

What is the policy issue?

It is understood that healthy, well-functioning ecosystems enhance natural resilience and reduce the vulnerability of people by mitigating the effects of climate change. Nature-based solutions make use of the crucial links between climate and socio-economic changes, supply of ecosystem services, and biodiversity, in order to mitigate detrimental effects of change and foster sustainable resource management
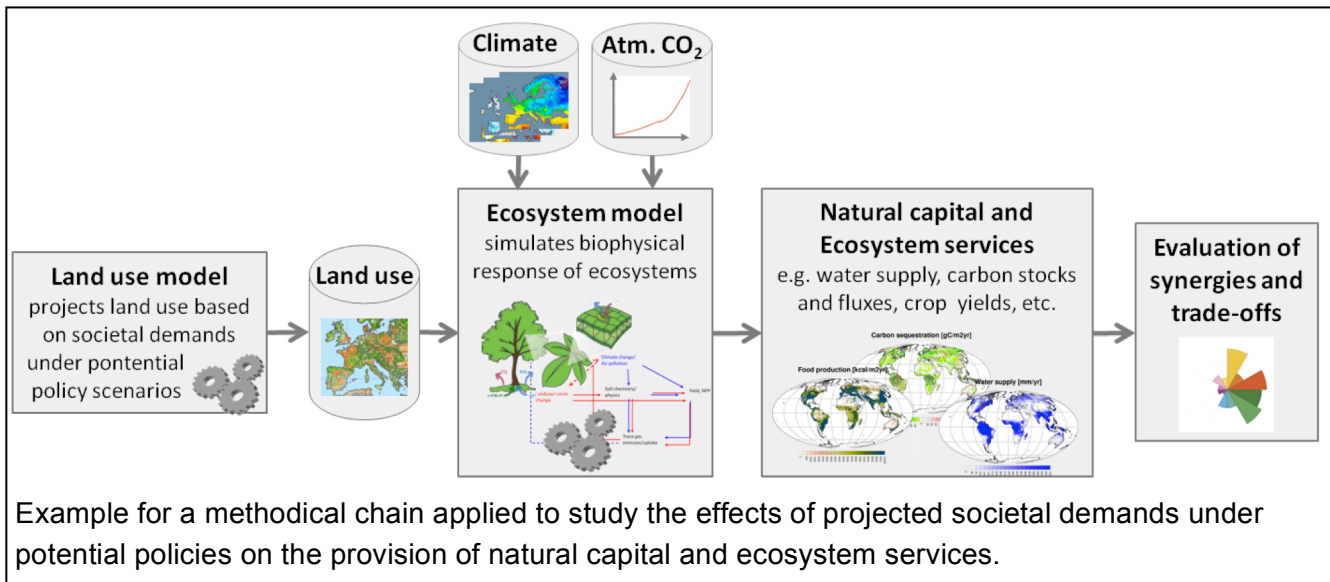
Required knowledge

Tools and methods are needed that realistically assess the effectiveness of nature-based climate change mitigation measures e.g. in terms of their impact on climate, trade-offs with other ecosystem services, cost-efficiency and challenges upon implementation. Ideally these tools provide a comprehensive, multi-perspective view of crucial drivers of change, their impacts on ecosystems, and effects of controlled ecosystem management, to avoid potential future problems. At the same time these tools should be open to use and easy to understand so that they can be applied by a wide range of users. Finally, the knowledge of effective nature-based climate mitigation solutions must be included in economic decision-making.

OPERAs activities

A number of activities in the EU FP7 project OPERAs contribute to nature-based solutions for effective climate mitigation. Example developments and applications include:

1. Projections of future land use under the assumption of societal and economic demands resulting of proposed policies.
2. Tools to analyze and map biogeochemical implications of proposed policies, e.g. changes in carbon sources and sinks, crop yields.
3. Evaluation of uncertainties in ecosystem service quantifications.
4. Practical experience in the testing and application of nature-based solutions in case studies of various contexts.
5. A framework for systematic analysis of effectiveness indicators on the implementation of nature-based solutions
6. Practical methodologies to address trade-offs associated with the use and management of ecosystem services.

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Example for a methodical chain applied to study the effects of projected societal demands under potential policies on the provision of natural capital and ecosystem services.

7. Enhanced metrics for improved understanding and assessment of the contribution of ecosystems to climate regulation, e.g. Greenhouse Gas Value.

Planned results

The tools and methods developed and tested within OPERAs are translated into comprehensive guidance and toolkits on how to address nature-based solutions from a practical and policy context to deliver an effective implementation. These will be made available on the open platform OPPLA and will be used to provide users with the relevant information required to address context-specific problems.

Anticipated challenges

Various pitfalls exist along the way towards a successful and sustainable implementation of nature-based solutions for efficient climate change mitigation, which we might not be able to fully eliminate but, however, will address in our user guidance.

Selective view: the complexity of environmental and economic systems and their interactions (alongside with remaining scientific knowledge gaps) requires our analyses to focus on selected indicators. Environmental and economic processes not encompassed by these indicators are therefore neglected.

Solutions across scales: Local and national management decisions may be more adapted to specific needs and are usually easier to implement. Large-scale solutions provide a wider view including environmental and economic offsite effects, but may face significant socio-cultural challenges upon implementation.

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