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Sustainable land management: new ways towards regional environmental governance?

Key words

sustainable land management, regional governance, Germany

Topics

Governance, institution and policy integration

Abstract

Searching for potential improvements of governance strategies and concepts to solve complex land use problems is an ongoing activity in science and practice. Currently in Germany a new research programme “Sustainable land management” starts. The programme will support the development of innovative theoretical, methodological and conceptual approaches of spatial governance towards sustainability. The following article describes the research programme in detail and analyses the approaches of the various projects to support and implement ‘sustainable land management’.

1. Governing “land”

Since centuries mankind influences landscape and creates different types of land use nearly globally. In the 19th and 20th century the ‘agricultural revolution’ and the ‘industrial revolution’, connected with new opportunities in mobility and consequences for urban development, caused radical changes of land use.

In addition to these fundamental aspects several main drivers influence or will influence landscape and land use. These are globally changes in values (e.g. sustainability), economic and social trends (e.g. globalisation, demographic change), technological innovations (e.g. for communication) and political priorities (e.g. in climate and biodiversity policy).

During the last two decades the following drivers attract importance in Europe (cp. BMBF 2008, NKGCF 2009, WBGU 2009, EEA 2007):

- climate change
- energy demand and energy policy
- European water policy
- suburbanisation and urban-rural linkages
- land use change for infrastructure

Driving forces as well as consequences are interconnected and cause effects on regional land use systems including ecosystem services as well as quality of life and living space

For instance complex interrelations and feedback mechanisms between land use and climate change exist (IPCC 2007). Thus land use affects climate change and vice versa. Climate change will not only change our landscape directly but also societal requirements to land use. For example land resources can be used to produce renewable energy or to sequester carbon. Water availability is an essential condition for agricultural production and human settlements. Urban areas are highly vulnerable to climate change and natural disaster like floods or extreme weather events.

Within the renewable energy sector currently bioenergy plays an outstanding role, quantitatively more important than solar and wind energy systems up to now. The increasing cultivation of biomass for energy supply involves changes in land use and characteristic landscape

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(cp. Kruska & Emmerling 2008). Competitions and conflicts are to be expected between land use for bioenergy and food and feed production as well as material use of biomass including aspects of protection of soil, water and biodiversity. In addition a higher demand of wood for bioenergy supply will generate impacts on the management of forests in Europe. Driven by current energy policies the demand for wood will increase during the coming decades.

At last suburbanisation and infrastructure development causes conflicts with other land uses since centuries. Especially in growing metropolitan regions in Europe new conflicts will increase with existing agricultural land use or recreation areas with water supply functions (EEA 2005).

Up to now high uncertainties exist to define interrelations and interactions between different drivers. Integrative models are missing, because knowledge of interrelations between influencing factors, actors, impacts or outcomes of action is limited. Especially models analysing governance arrangements have to deal with problems of specifying and weighting influencing factors (cp. Benz 2004). Most of the existing scientific models for describing the human-nature-interface are created for optimising one single land use (e.g. agriculture) or technical use (e.g. water for power stations). This causes problems of interplay. Complex numeric decision support systems or integrative interfaces are only in use for macro analysis of politics (e.g. Meadows/Meadows/Randels 1992) but not on regional or local level.

To deal with land use conflicts and opportunities for synergies in Europe a high variety of institutional arrangements and regulatory schemes has been initiated and implemented. On several levels of policy (EU, national, regional, local) different types of influential strategies, instruments and measures are realized, focussing on different actor groups. Examples are European agricultural policy (e.g. with cross-compliance rules) and water policy (Water Framework Direction), national spatial and infrastructure development procedures (e.g. spatial planning in Germany, Austria and Switzerland), regional development schemes (e.g. in UK) or local planning and building schemes and permission procedures (nearly all over Europe).

Currently problems in governing land are seen in an up to now missing integrative and complex approach, fragmented problem analysis, incomprehensive strategy development, and development of solutions focussed only on specific contents or institutional arrangements. In this context up to now an accurate scientific definition of 'sustainable land management' is missing. The term is mainly used as a normative approach in land use of developing countries. Organisations like the United Nations or World Bank use the term to discuss problems and solutions of soil protection and degradations or more in general for land use aspects (participation, ownership, re-forestation) in developing countries (Hurni 1997; The World Bank 2006). Only in Australia and New Zealand 'sustainable land management' is an official topic of national environmental policy, but strongly connected to solve problems in relation to climate change. Although land use aspects are part of many European Union policies (regional policy, environmental policy, agricultural policy), main European political agendas target land management issues only in some aspects (Gothenburg-Strategy, Leipzig-Charta).

Based on a reflection of political agendas (mentioned above) and scientific debates about land use (e.g. EEA 2006, EEA 2007) main themes for generating innovative theoretical, methodological and conceptual approaches of spatial governance towards sustainability are:

- targets of / in land use
- drivers of land use change (actors, interests, resources)
- complex regional interactions between current land use as well as land use options
- synergies and conflicts in land use

- sustainable solutions in land use
- land management / governance and technologies / land use policy.

2. Funding measure “Sustainable Land Management”

In consequence of the problems and challenges of governing land mentioned above, the funding measure “Sustainable Land Management” was started by the German Federal Ministry of Education and Research (BMBF) in October 2008. It was designed to generate the basic knowledge which is needed for sustainable land management decisions and to provide relevant strategies for action as well as suitable technologies and system solutions by means of inter- and transdisciplinary research approaches (BMBF 2008).

The measure has been started with a call for joint research projects and scientific coordination projects. Meanwhile several projects with different themes, concepts and strategies are on the way respectively near to be granted.

The entire funding measure is split up in two main modules (A and B) which reflect differing topics. Both modules are supported by two scientific coordination projects. Module A, called “Interaction between land management, climate change and ecosystem services”, operates mainly at international- and European level. The scientific coordination will be realised by Helmholtz Centre for Environmental Research (UFZ) located in Leipzig/Germany. Module B is seeking for “Innovative system solutions for sustainable land management” at European and national level. Therefore the coordination project is aimed to generate innovative system solutions for regional value creation networks and promoting integrated management of energy and material flows (BMBF 2008). This module is coordinated by Leibniz Centre for Agricultural Landscape Research (ZALF) located in Müncheberg/Germany. The joint research projects of Module B comprise different types of land use, landscapes, actor networks and institutional settings. They focus on:

- settlement development
- evaluation of projects in housing and the development of commercial areas and infrastructure
- cultural landscape development
- connection between energy prices and land use
- zero-emission communities (towns and villages)
- energy management and supply chain management
- production chains
- use of bio-energy and dendro-mass (Dendromasse)
- application of ecosystem services.

One of the first issues to cope with is the definition of the term “sustainable land management”. Although often used in the programme, it is still vaguely defined. The call of the Federal Ministry describes that “land management (...) means far more than traditional agriculture and forestry. It is a highly complex field of action which affects all areas of human life and includes such aspects as water, soil and biodiversity management, regional value creation, the relationship between urban and rural regions, quality of life, etc.” (BMBF 2008).

Within the funding measure the various projects as well as the scientific coordination will realize the translation of challenges of sustainable land use into research practice. The scientific coordination of Module B, in responsibility of the authors, will focus on the meta-

analysis and development of successful tools for sustainable land management in Germany and Europe. Moreover, the analysis and valuation of inter- and transdisciplinary approaches will be a central aspect of the accompanying research (Klein et al. 2001).

Both, “sustainable land management” and “inter- and transdisciplinarity”, will be realised at three different levels:

- scientific support of the joint research projects through coordination and networking
- synthesis and meta-analysis of project-based results
- support of scientific and problem-oriented dialogue, qualification, transfer and deliberation processes.

Main function of synthesis and meta-analysis is to analyse, differentiate and compare:

- types of synergies and conflicts in land use
- conceptual models of problem solving for interaction in land use and changes of land use (e.g. energy flows, urban-rural networks)
- types of existing and potential governance
- inter- and transdisciplinary research approaches.

In a second step, styles and modes of governance as well as research approaches will be valued together with joint projects and stakeholders analytical concepts.

Results will be transported by means of internal and external internet-based platforms and frequently organised workshops. The discussion shall facilitate integration of international discussions driven by UN and World Bank policies and support learning from best practices. Furthermore different groups of stakeholders (e.g. land owners, representatives of companies, civil society groups) shall be involved to include and reflect interests and resources in decision making processes about land use in a systematic dialogue. A bundle of analytical and conceptual activities is planned to cope with complexity and to generate successful ways towards sustainability in land use.

In a mid-term perspective the scientific coordination project will establish an organisational structure which will institutionalize communicative networks between research and regional stakeholders to support learning and innovation processes also on a strategic level.

Thanks to the multi-faceted setting of involved actors of comprehensive and sustainable land management (politicians, companies, scientists, interest groups, etc.), inter- and transdisciplinary research approaches applied by the projects will be identified, documented and valued by the scientific coordination. In conclusion, recommendations are possible for qualifying ongoing and future management of research processes. Synergy effects and cross-cutting issues between joint projects will be identified as well as bottlenecks in implementation. The exchange and cooperation between joint projects will create an additional value.

3. Sustainable land management: a new way?

Using the ideas of the joint projects of the research measure described above, this chapter will contain a first draft of potentially important future aspects in sustainable land management. Due to the high variety of involved actors, high numbers of interactions and interconnections, existing multi-level governance, heterogeneity and variety of institutional frameworks as well as differing territorial challenges one main aspect in this context is handling complexity by structuring ideas and activities (see Scharpf 2006, Perker/Hessl/Davis 2007).

Following Benz 2004, Scharpf 2006, and von Prittwitz 2007 important aspects to differentiate governance are:

- potential key elements and contents,
- processes, strategies, instruments and concepts.

One main key element of the projects is the connection of ‘governance of flows’ with ‘governance of space and place’ (cp. Mathews/Herbert 2008). The first refers to handling aspects of energy, water / waste water, carbon cycles, supply chains and knowledge. The last focuses on regional urban-rural areas, cultural landscapes and poles of economic development. One example for such a connection is the spatial demand and supply of energy.

All projects combine differing contents of governance in a synergetic way. Examples are water management and waste management, water management and wetland restoration, water management and energy supply, settlement development and mobility aspects, housing and energy consumption as well as the combination of the development of energy plants, biomass production, food production and recreation.

The joint projects aim at changes in governance. Most important fields are infrastructure management and development, urban and regional planning, agriculture policy, forestry policy, and climate policy. Implementation shall be realized mostly in a participative way due to the involvement of a high variety of actor groups (public policy and administration, companies, urban networks, civil society representatives).

For solving current problems and challenges in land use specific principles and strategies are recommended. Main research approaches are, as basic requirement of the programme, inter- and transdisciplinarity. This includes the integration of engineer, natural and social science on different levels (coordination, manager, and joint project level). Public actor, companies or civil society actors are seen as starting points, nuclei, and development partners for implementation of sustainable solutions in land management. Networking realise partnerships between public or private enterprises, households, and municipalities.

Well-known principles like efficiency, mitigation or recycling are combined with new directions like adaptation, cascade use system, risk management, development of spatial business intelligence system or with the use, protection and development of ecosystem services. Main intention is to generate synergies for supporting institutional innovations.

Summing up the connection of all these parts does not allow a new and precise definition of “sustainable land management” at the moment. One main new aspect could be seen in a “multi-multi-approach”, because of the combination of multi-level, multi-sectoral, multi-actor and multi-principle activities.

Further research activities within the research measure, including external discussions of environmental governance, will be necessary to define “sustainable land management”. This is an ongoing process. Further results including the scientific coordination are to be expected in 2011/2012.

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