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ANALYSIS

Transdisciplinarity for social learning? The contribution of the German socio-ecological research initiative to sustainability governance

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ABSTRACT

Governance depends upon inputs from science. Whereas the conventional view portrays science as advisor of policy makers, more recent understandings see knowledge creation processes and decision processes as highly interrelated and intermingled. Against this background, we analyse the new research programme on socio-ecological research set up in Germany. In doing so, we firstly discuss current conceptual approaches to redefining the role of science in society. Secondly, we identify five challenges for scientific activities and apply these as criteria for an assessment of the socio-ecological research initiative. Thirdly, we analyse the potential limits and opportunities of this programme for social learning towards sustainable development. We also indicate what can be learned for ecological economics.[2]

1. Introduction

Ecological economics sees itself as the science and management of sustainable development and claims to be more than "just science" in the traditional sense of the world — an activity that explicitly aims at changing the world. In this world, "traditional" science[3] is under attack anyway, for the conditions of the production of knowledge have

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[3] If not stated otherwise, we use the term "science" to denote both natural and social sciences.

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profoundly changed in the last decades. What is more, global problems of poverty and ecological damage have not only challenged the role of science, but of political processes as well. In this situation, "governance" becomes a central topic of ecological economics. Very obviously, ecological economics, with its explicit vision of a science that contributes to sustainability, must deal with the roles of different actors and institutions that are relevant for governance for sustainable development.[4] One crucial factor in this context is the relationship between governance and the production of knowledge — and the fact that the line between these two realms has become blurred.

In order to obtain a clearer picture of the processes of scientific knowledge production and its interaction with governance for sustainable development, a closer look is needed into the learning processes that take place on the border between the political process and scientific work. Social learning is highly interrelated with the generation, construction and representation of scientific knowledge and the openness, flexibility and variety of the governance systems of collective decision making. The political system depends upon informational and conceptual inputs and contributions from the other societal systems in the governance process — for example, the social and the natural sciences. Whereas the conventional view portrays science as an advisor of policy makers, more recent understandings of this interaction see the knowledge creation process and the decision processes as highly interrelated and intermingled (Jasanoff, 2004b; Gibbons et al., 1995). The role of science as a key societal actor that also creates realities beyond the traditional path through the policy making process, has, however, scarcely been addressed.

Building on a notion of transdisciplinarity as the inclusion of non-scientific actors into the processes of knowledge generation and implementation, a new research programme has been set up in Germany. It intends to promote sustainable development through innovative research project designs that directly involve societal actors and aim at the combined knowledge generation and at influencing societal developments into the direction of sustainable development. The *socio-ecological research programme* is funded by the German Federal Ministry for Education and Research following similar programmes in Switzerland and Austria. In the context of social learning at the science-policy-society nexus, the programme raises numerous questions that will be addressed in the present paper. We start with a description of current debates concerning the role of science for social learning in the context of sustainable development. Against this background, we sketch five specific challenges for scientific activities and apply these to the socio-ecological research programme. We analyse the potential limits and opportunities of this programme for social learning towards sustainable development. In conclusion, we also indicate the relevance of our finding for ecological economics.

[4] The fact that these actors frequently refer to time-scales different from that of scientists is beyond the scope of this paper.

2. The role of science in social learning for sustainability

2.1. Novel perspectives on science

The political system depends upon informational and conceptual inputs and contributions from the other societal systems in the governance process, among others from the social and the natural sciences. According to the conventional view as spelled out by Price (1965), science is seen as an advisor of policy makers and both spheres need to be rigorously separated. More recent understandings of this interaction see the knowledge creation process and the decision processes as a social process where both spheres closely interact and merge. The discourse on sustainable development gave a new push to this debate. Sustainable development entails highly complex challenges that include multiple problem dimensions starting from poverty eradication to safeguarding of ecosystem services and to economic development to feed the entirety of humankind. This complexity and the multi-layered scales of the problem render the relationship between governmental regulation and scientific information even more difficult than in more conventional problem arenas.

While conventional environmental problems such as air and water pollution have been somewhat successfully addressed by regulatory approaches that drew on issue-specific scientific advice, the complexities and the multiple scales and actors of sustainability governance require a different approach (Grunwald, 2004). First, uncertainties are significantly larger given the sheer number of factors involved. Sustainability addresses social, economic and ecological indicators at the same time and acknowledges the fact of their interconnectedness. Thereby, ecological processes have to be monitored and analysed in their interaction with social systems that are by nature subject to human volition. While ecological processes are already difficult to analyse, social processes are highly uncertain and unpredictable (Jasanoff, 1987; Sarewitz et al., 2000). Second, numerous new actors enter the stage of the governance process. Governments are neither the prime actors in this process nor can they prescribe distinct solutions to all problems. It is non-state actors of different kinds that are increasingly seen as crucial for the promotion of cures and innovative solutions to environmental and social problems. These include private corporations as well as non-governmental organisations, scientific communities and other civil society groups. Sustainability-related rule-setting processes can be observed that come into being entirely without government intervention. Third, the modes of governance change from conventional regulatory command-and-control schemes to different forms of interaction between actors and regulators ranging from cooperative learning circles to voluntary agreements and information requirements.

In this context, social learning has been described as the prime governance process to approach the objectives of sustainable development (The Social Learning Group, 2001; Kopfmüller et al., 2001; Board on Sustainable Development of the National Research Council, 1999; Parson and Clark, 1995). Following this strand of literature, social learning can be