

# The role of the social sciences for biodiversity and ecosystem management

Astrid ARTNER and Rosemarie SIEBERT

## Abstract

To be successful biodiversity management has to be embedded in social structures. The social sciences have the appropriate tools to investigate these social dimensions. However, they are not yet sufficiently integrated in biodiversity research and policymaking which are dominated by natural sciences. By means of a literature review contributions made by the social sciences of seven European countries are analysed. To process the literature selected with regard to its relevance for policymaking, we chose the policy cycle model. The results were validated by expert interviews with key researchers and policymakers. We present current research approaches of the social sciences and derive some conclusions regarding their contribution to biodiversity policymaking, and suggest future policy-relevant key topics for social research.

**Keywords:** social sciences, sustainable policymaking, biodiversity management, policy cycle model.

## 1. Introduction

Implementing conservation policies or management plans that are directed solely at ecological targets will not achieve the goal of sustaining species and habitats. Instead, it is necessary to integrate the human and societal dimension into such activities because, after all, conservation policies are the product of human decision-making

processes. The social sciences can contribute, on the one hand by analysing human characteristics and social structures in which management policies can be embedded; on the other hand they can offer solutions for sustainable policymaking and biodiversity management (MASCIA et al. 2003). However, they are not yet sufficiently integrated in the natural science-dominated biodiversity research and the development of biodiversity policy.

Based on these considerations this article gives an overview of the contribution that has been made by social sciences relevant to the management of biodiversity and ecosystems, particularly with regard to the development of successful policies in this field<sup>2</sup>. It evaluates research approaches from Germany, Hungary, Norway, Romania, the Slovak Republic, Spain and the United Kingdom and addresses gaps in knowledge as well as priority policy issues (SIEBERT et al. 2004).

## **2. Contributions of the social sciences to policymaking**

There is a strong interaction between humans and nature: many ecologically valuable habitats have evolved from traditional socio-economic land use practices. The deterioration of many habitats can also be traced directly to social processes. Furthermore, recent experience shows that the successful implementation of biodiversity and ecosystem management policies needs the acceptance of the public and often requires changes in societal systems and structures.

However, with the emergence of biodiversity policymaking in the early 20<sup>th</sup> century it is natural science that has been used to reveal environmental problems, explain their causes and support the development of environmental legislation. Social scientists have tended to be seen as social engineers “addressing the social causes, impacts and responses to environmental problems which have been initially and accurately described by the natural scientist” (MACNAGHTEN and URRY 1998, 6).

---

<sup>2</sup> This article is based on results of the project “SoBio – Mobilising the European social research potential in support of biodiversity and ecosystem management” which is financed by the EU within the 6<sup>th</sup> framework programme and runs from 2004-2006.

The only scientific discipline that has been able to establish beside natural sciences is economics. SIMMONS (1993) accounts for its success as it is about means rather than ends and stands back from criticism of policy. The more critical social science is by contrast less attractive, as it questions, not only political goals, but also the values and assumptions from which those goals are derived (MILTON 1996). Yet the social sciences have not only had little access to such research, but have also tended to restrict their sphere of interest to 'society' and have left the 'environment' or 'nature' to the natural scientists (IRWIN 2001; MILTON 1996; PARDO 1996, SUTTON 2004).

However, due to rising public concern and high profile social conflict over environmental issues and a growing number of international summits and conventions there have been calls for a more significant role for the social sciences in the study of environmental issues since the 1990s (FITZSIMMONS 1989,106).

However, while the social sciences have carved out their place in environmental studies, they are not yet sufficiently integrated into the research on biodiversity and ecosystem management due to the dominance of the natural sciences, the lack of demand on the part of policymakers, lack of research funding, and the ignorance that exists about this very new and complex topic among social scientists themselves.

### **3. Methods and materials**

A literature study reviews available theoretical and methodological approaches from a range of disciplines, including sociology, human geography, politics, planning, anthropology, psychology and rural studies to show the contribution of social science research to biodiversity and ecosystem management. The review was complemented by qualitative interviews with 46 key environmental researchers and policymakers to validate the results of the desk study and to gain insights on how social science might best contribute to biodiversity management.

For the literature review a total of 326 publications from seven countries were selected. The highest number of publications was collected for the UK (97 studies), while the CEECs and Spain were only able to feature a small amount of literature. German and Norwegian

research efforts (88 and 52 studies respectively) indicate a growing interest within the social sciences for biodiversity research.

Albeit the majority of research has been carried out by sociologists in all countries, there are some remarkable exceptions. In the UK a broad range of disciplines is involved in current social research, and in particular human and cultural geographers are very active in UK biodiversity research. In Spain most of the authors' original discipline is ecology (40%), indicating that ecologists tend to explore new disciplines and fields of study more often than sociologists or other social scientists (see also PANIAGUA et al., 1998). In the CEECs interdisciplinary studies feature strongly in biodiversity research.

To respond to the question of the contribution of the social sciences to biodiversity management, topics that appear in international and European political debates form the basis for the selection of the relevant literature: the impact of demographic changes on ecosystems; attitudes and behaviour; knowledge transfer; stakeholder participation and governance of the 'commons'; new and innovative biodiversity management strategies; and evaluation of programmes with regard to their social sustainability.

To assess the literature selected with regard to its relevance for policymaking and biodiversity management, the policy cycle model was chosen. The policy cycle has been developed as a tool of policy analysis and is aimed at simplifying the complexity of public policymaking processes. It is based on the understanding that the phases of the policymaking process can be broken down into stages with specific characteristics (DELEON, 1999, JANN and WEGRICH, 2003, DUNN, 2004). This stage model makes it possible to gain a problem-oriented perspective on complex, interacting phases of a political problem and allows us to examine policies in a theoretical, process-oriented way.

However, the model does have some disadvantages as well (DELEON 1999, PRITTWITZ, 1994). In reality policy processes hardly run in a systematic and linear way, they rarely have clear starting and end points, and the different stages often overlap. In addition, the model lacks the element of causality, as it fails to answer the question of who or what drives a policy process from one stage to the next. It also assumes that policymaking occurs in relation to targeted problem-

solving and thereby disregards the embeddedness of policy in traditional political, administrative and social structures.

However, most of the disadvantages mentioned above do not affect the use of the policy cycle model as the basis of a systematic analysis of literature addressing biodiversity management. Although the allocation of publications to specific stages is a somewhat ambiguous undertaking, the policy cycle model still forms an excellent background for the literature analysis, as it presents a clear and easy structure for the literature assessment. In addition, this policy analysis tool enables the link between social science and policymaking to be highlighted very clearly.

The four-stage cycle consists of following stages: *Agenda Setting* represents the initial stage of the policy cycle – the public becomes aware of an issue as a problem. Starting points for action are identified and preliminary decisions, such as the selection and assignment of priorities are made. The process of *Policy Formation* takes place within the set of rules laid down by the political system and the protagonists concerned. The issues requiring attention can be converted into political programmes and adjusted to other policy fields and social needs. The policy thus formulated is then given its final structure during the process of *Policy Implementation* involving subordinate political and administrative protagonists. To measure and document the extent to which the objectives of biodiversity policies and action plans have been achieved, the final stage is *Policy Evaluation*.

#### **4. Social science biodiversity research in Europe**

A comparison of the reviewed literature reveals a number of similarities regarding research objects and methods of investigation. With the exception of Norway, social research concentrates mostly on nature conservation within well-defined areas. Qualitative research approaches, especially interview techniques, are particularly in evidence, pointing to the small scale of these studies, as qualitative research is both costly and time-intensive.

Differences in research are evident between the Eastern and Western European countries. While there is a longer tradition of biodiversity research in Western Europe, social research in this field stands in the tradition of disciplinary research. EU and international funding

programmes have enabled the CEECs to make great strides in social scientific biodiversity research since the transition period. As these programmes aim to promote interdisciplinary research, this is, much more than in Western Europe, an approach that figures prominently in CEEC's research. Research in these countries includes a high number of exploratory studies for implementing projects or action plans for biodiversity conservation, often from the perspective of sustainable development.

In allocating the publications identified to the four stages of the policy cycle, it becomes clear that there is a large proportion of 'Agenda Setting' research. A quarter of all the publications deal with 'Policy Implementation', albeit with marked differences between the different countries. Only a few studies fit in the categories of 'Policy Formation' and 'Policy Evaluation', indicating that these areas remain on the fringes of social research (see Fig. 1).

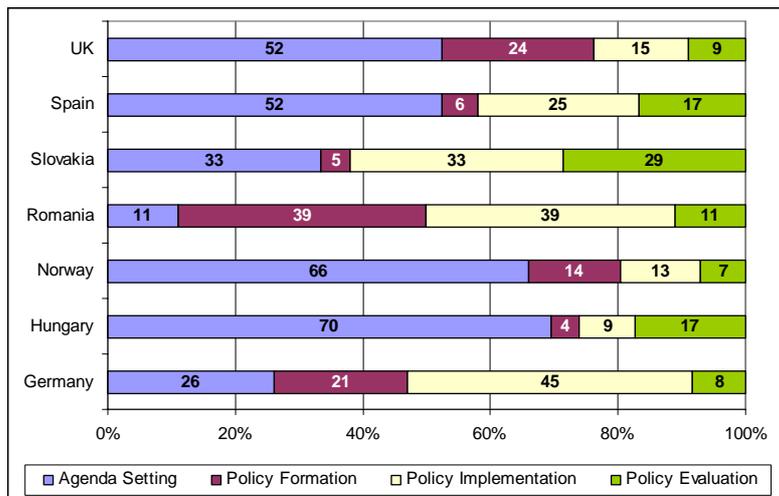


Figure 1: Shares of publications per country and policy stage

The themes of social science research on biodiversity management will now be presented according to the stages of the policy cycle.

#### 4.1. Agenda Setting

The societal recognition of problems and the articulation of needs build the basis for policymaking. The high proportion of studies in Agenda Setting (45%) indicates the significance of problem identification and analysis for social scientific biodiversity research.

The bulk of the literature analyses people's attitudes and perceptions towards nature, the landscape and specific protected areas. Most publications were found in the UK. Most of these argue from a constructivist point of view, an approach that has been partially adopted by German researchers. By contrast, surveys carried out in Spain tend to consider values and perceptions as being relatively stable. Different and conflicting perceptions of species is a current international research topic which has been taken up by Norwegian and UK researchers in particular. It is also increasingly adopted in management-oriented research approaches in the other SoBio countries. The social scientific discussion in the UK about the role of the media in the construction of nature clearly illustrates how the media influence society's image of nature and species.

Some studies analyse attitudes towards nature held by certain stakeholder groups (in most cases, by farmers), but there is still a marked lack of studies that differentiate between different social and cultural groups (e.g. gender perspectives) or address the interests and conflicts arising from these differences. While attitudes towards nature have been analysed extensively, patterns of behaviour have rarely been integrated into researchers' efforts. Analysis of how non-environmental behaviour impacts on biodiversity loss may provide valuable data for future decision making processes in biodiversity policies.

The societal recognition of biodiversity loss is tied to public debate. However, the idea of biodiversity has not yet entered public consciousness to any great extent. The discourse is largely conducted by a circle of political scientists and ethicists, particularly from the UK and Germany. In the UK, a considerable amount of research is done from a constructivist perspective. In Hungary, by contrast, theological ethics has had a considerable influence on the biodiversity debate.

## 4.2. Policy Formation

Policy Formation refers to the conversion of problems and demands in political programmes. Comprising only 18% of all the SoBio publications, Policy Formation research so far seems to be low on the agenda for social researchers.

The analysis of available knowledge and the development of models of knowledge transfer are recognised as being central topics of social science biodiversity research (VADINEANU, 2004, MÜLLER et al., 2002). However, only Romanian social research emphasises the potential of traditional knowledge for biodiversity management. The dissemination of scientific knowledge to the public is a marginal research topic and is carried out mostly by German researchers.

In the UK, Norway and Germany the distribution of power between various actor groups involved in policy formation is considered, along with the way in which these impact on relationships and negotiations. UK research in particular analyses the institutional framework of biodiversity policymaking; the development of biodiversity conservation and of involved institutions; social and cultural negotiations and how these influence the policy formation process in terms of emerging interests and arrangements of power. German social scientists tend to specialise in policy advice, based on analysis of the preconditions for successful biodiversity policies and management.

Many policy formation studies have in common the conceptual background of sustainable development, governance or the participation of the local and regional public. They stress the significance and implications of integrating the positions of various actors with regard to their social and cultural background.

## 4.3. Policy Implementation

Policy Implementation comprises the themes of the dynamics of decision-making processes, conflicts and the public participation in biodiversity management. Due to the conflict potential of new biodiversity policies and management plans, the potential contribution of the social sciences is considerable. Policy Implementation is the second most relevant policy stage (26%) for social researchers after Agenda Setting.

In Germany and Romania in particular, the social sciences are largely concerned with issues that arise from the implementation of biodiversity policies. This may indicate a stronger orientation towards management-oriented research in these two countries. In Germany extensive research exists on the acceptance of nature conservation and protected areas by those sections of the public most affected. Conflict resolution methods and participation tools have been developed and tested on the basis of the results of acceptance research. Romanian research emphasises the participation of different actor groups in biodiversity management, analysing their needs and the roles they could play in management.

Conflicts arising due to management practices which exclude the public are given broad attention by UK and Norwegian researchers. Norwegian research not only identifies relevant stakeholder groups but also analyses the role of indigenous people in biodiversity management and the conflicts that arise due to the differing interests of social and cultural groups as regards natural resource use. In these studies, use forms of biodiversity management are – unlike protection in the other SoBio countries – the main objects of research.

Biodiversity policies may impact on existing use strategies and change the economic and social situation of regions. The question of how the diffusion of new methods and ideas affect different stakeholders has only been raised by German researchers, who emphasise the role nature conservation can play in stimulating the potential for innovation in particular regions through biodiversity management measures.

#### 4.4. Policy Evaluation

The stage of Policy Evaluation includes the evaluation of policies and action plans as well as the comparison and assessment of management measures and indicators in terms of their social effects. Policy Evaluation (11%) is low on the research agenda, despite the often stated need for social evaluation of biodiversity policies and action plans.

Publications on the evaluation and assessment of policies and action plans reveal a very fragmented picture and there are no consistent evaluation approaches. Studies have been carried out in all the SoBio countries, but were done without any comparable approaches or methodologies. Also, they were applied to different levels and subjects

and are of highly variable quality. Such studies range from the evaluation of EU policies to assessments of the social impacts of management plans. Given that researchers are generally aware that education and communication are important factors for facilitating the acceptance of management plans, relatively few publications concentrate on the evaluation of educational and communication programmes within biodiversity management projects.

Evaluation carries greater significance in Eastern European countries, a fact which can be probably traced back to the international funding of biodiversity projects and the need to evaluate them at a later stage. However, at the international level various indicator systems and tools for the monitoring and evaluation of policies and management plans and their sustainability are being developed.

## **5. Conclusions**

The review reveals that the social sciences contribute considerably to biodiversity research in the stages of Agenda Setting and Policy Implementation. Analyses of attitudes towards nature can provide a basis for the implementation of policies. The analysis of conflicts, public acceptance and participation in biodiversity management as well as the development of conflict resolution methods provide policy-oriented scientific knowledge.

Conversely, policy formation research and the evaluation of the social dimension of biodiversity policies are still in their early stages, although both the literature review and the interviews identified the policy evaluation stage as an increasingly important field for the contribution of the social sciences.

Three conclusions can be drawn from the literature review and interviews conducted. First, the social sciences have a considerable contribution to make to biodiversity research, but at present they are only marginally integrated in the research community. The choice of research topics is narrow and strongly influenced by international debate. However, there are a few country-specific research areas, that could form the starting point for the further development of consistent research approaches, adjusted to the needs of policymakers.

The second conclusion concerns the observation that the insights of contemporary research have not penetrated biodiversity management

practice. Nearly half of all publications belong to the Agenda Setting stage of the policy cycle with many basic research studies, which have little relevance for policymaking.

However, the majority of the 26% Policy Implementation studies use qualitative, applied research methods, relevant for biodiversity management at the small scale. There is only little contribution of social research regarding the implementation of biodiversity policies at the national or even EU level.

This conclusion also relates to the relationship between biodiversity practitioners and those carrying out research in academic institutions. The third principal conclusion is that social scientists need to better and more openly engage with practitioners and policymakers. Scientific results are often not translated into practical, realistic recommendations for policymaking. Also, policymakers need to communicate their needs clearly to scientists. More research is needed to understand and help to bridge the communication gap between science and policy.

Starting points for future research should be the country-specific approaches, which could be exchanged and adopted by researchers in other European countries. The use of transdisciplinary methods is as essential to biodiversity research and management as the integration of all the ecological, economic and social dimensions via interdisciplinary research. Research should be carried out at several policy stages to facilitate effective policymaking that is responsive to socio-cultural and societal structures and realities. Social research should be extended to include comparative studies to achieve consistent European policy and biodiversity management solutions. Moreover, the term of biodiversity management should be expanded from conservation to forms of use.

Greater support and facilitating structures would enable the social sciences to establish their own emphases in research relevant to biodiversity management. Thus the social sciences could make an important contribution to biodiversity management and policymaking in Europe.

### Literature

- DELEON, P. (1999): The stages approach to the policy process. What has it done? Where is it going? In Sabatier, P.A. (ed.): *Theories of the Policy Processes*. Boulder: Westview Press, pp. 19-32.
- DUNN, W.N. (2004): *Public Policy Analysis: An Introduction*. 3<sup>rd</sup> ed. Upper Saddle River, NJ: Pearson.
- FITZSIMMONS, M. (1989): The matter of nature. *Antipode* 21, 2, 106-120.
- IRWIN, A. (2001): *Sociology and the environment: A critical introduction to society, nature and knowledge*. Cambridge: Polity Press.
- JANN, W. and K. WEGRICH (2003): Phasenmodelle und Politikprozesse: Der Policy Cycle. In Schubert, K. and N.C. BANDELOW (eds.): *Lehrbuch der Politikfeldanalyse*. München: Oldenbourg, pp. 71-104.
- MACNAGHTEN, P. and J. URRY (1998): *Contested Natures*. London: Sage.
- MASCIA, M.B., J.P. BROSIUS, T.A. DOBSON, B.C. FORBES, L. HOROWITZ, M.A. MCKEAN and N.J. TURNER (2003): Conservation and the Social Sciences. *Conservation Biology* 17, 3, 649-650.
- MILTON, K. (1996): *Environmentalism and Cultural Theory: Exploring the Role of Anthropology in Environmental Discourse*. London: Routledge.
- MÜLLER, K., A. DOSCH, E. MOHRBACH, T. AENIS, E. BARANEK, T. BOECKMANN, R. SIEBERT and V. TOUSSAINT (2002): *Wissenschaft und Praxis der Landschaftsnutzung. Formen interner und externer Forschungskoopeation*. Weikersheim: Margraf.
- PANIAGUA, A., P. DEL RÍO, L. COLLADO and A. CADENAS (1998): La investigación socioambiental en España. Proceso de institucionalización y estructuras de investigación. *Revista Internacional de Sociología* 19 y 20, 315-326.
- PARDO, M. (1996): Sociología y medioambiente. Hacia un nuevo paradigma relacional. *Política y sociedad* 23, 33-49.
- PRITTWITZ, V.v. (1994): *Politikanalyse*. Opladen: Leske + Budrich.
- SIEBERT, R., A. ARTNER, M. DOBROVODSKÁ, L. GROTKOVSKÁ, K. HUESO KORTEKAAS, Z. IMRICOVA, Z. IZAKOVIČOVÁ, P. KENDERESS, O. KRANGE, A. MIDGLEY, M. MOYZEOVÁ, J. Oszlányi, T. PALARIE, K. SKOGEN, C. SUNYER, K. SZEKER, M. TOOGOOD, A. VADINEANU, Z. VÁLKOVCOVÁ (2004): *SoBio – Mobilising the European research potential in support of biodiversity and ecosystem management*. European overview. Müncheberg: unpublished.
- SIMMONS, I. (1993): *Interpreting nature: Cultural constructions of the environment*. London: Routledge.
- SUTTON, P.W. (2004): *Nature, environment and society*. Basingstoke: Palgrave Macmillan.
- VADINEANU, A. (2004): *Adaptive management of socio-ecological complexes: An ecosystem approach*. Bucharest: ed. Ars Docendi, University Press.
- For more literature see: [http://www.ecnc.nl/file\\_handler/documents/original/download/153/Reference\\_library.doc](http://www.ecnc.nl/file_handler/documents/original/download/153/Reference_library.doc)

**Affiliation**

*Astrid Artner and Rosemarie Siebert  
Institute of Socio-Economics  
Leibniz-Centre for Agricultural Landscape Research (ZALF) e.V.  
Eberswalder Straße 84, 15374 Müncheberg, Germany  
eMail: artner@zalf.de and rsiebert@zalf.de*