GOVERNANCE AND ECOSYSTEMS MANAGEMENT FOR THE CONSERVATION OF BIODIVERSITY

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Abstract: Over the past few hundred years, biodiversity has faced major challenges, including a growing demand for biological resources caused by population growth and increased consumption. Biodiversity is the basis for the successful provision of ecosystem services and therefore a key component of sustainable development. Biodiversity is also affected by all levels of governance and all the groups of actors involved.

This paper was developed in the context of the research project entitled GEM-CON-BIO (Governance and Ecosystems Management for the Conservation of Biodiversity), which is a European FP6 funded project under Priority 7 – Citizens and Governance in a Knowledge-Based Society.

In order to understand what constitutes "good governance" in the context of biodiversity conservation, our paper sets the methodology for exploring the interactions between governance modes and sustainable development objectives in view of identifying what governance processes and institutions can best contribute to the conservation of biodiversity. We claim that to understand what constitutes "good governance" in the context of biodiversity conservation, one needs to investigate what types and modes of governance are related to biodiversity conservation and sustainable development, to proceed in identifying the critical characteristics and threshold factors that exist the environment of an ecosystem management authority (environmental, social and economic factors), as well as who controls them, and to conduct research on how to relate these factors to "successes" and "failures" of sustainable development.

Keywords: biodiversity, conservation, sustainable development, governance, ecosystem management

I. Introduction

I.1. Biodiversity and sustainable development

Today's biodiversity is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the human influence. It is well recognized that the large supply of goods and services which biodiversity offers are necessary for human life [1]. However, over the past few hundred years, biodiversity has faced major challenges

(Baillie, Hilton-Taylor, Stuart, 2004). The recognition of this problem has led the scientists as well as the policy makers to work together in order to develop new mechanisms and regulatory techniques (Sands, 2003) aiming at the conservation and sustainable use of biodiversity.

The recently released Ecosystem Assessment clearly shows that ecosystems have changed more in the last 50 years than at any time before [2]. Some of the most damaged ecosystems are found in Europe such as Mediterranean Forests. Generally speaking the biodiversity in Western European countries has been significantly impacted through habitat loss and fragmentation through agricultural practices, urban growth and transport networks are the primary threats. In the east (Láng, 2003), the main threats include the intensification of farming and forestry and the illegal harvesting of flora and fauna. As biodiversity is lost, the quality of human life in Europe is increasingly at risk.

The EU agreed in 2002 at Johannesburg [3] that "protecting and managing the natural resource base of social and economic development are overarching objectives of, and essential requirements for, sustainable development". The EU also committed itself to the 7th Millennium Development Goal "to ensure environmental sustainability". In addition, through the Convention on Biological Diversity, the EU is committed (Art.10) to "integrate consideration of the conservation and sustainable use of biological resources into national decision-making; support local populations to develop and implement remedial action in degraded areas where biological diversity has been reduced; and encourage cooperation between its government authorities and its private sector in developing methods for sustainable use of biological resources." The 6th Environmental Action Programme [4] has targets of "restoring and developing the functioning of natural systems" (Art. 2) as well as aspiring to "prudent use of natural resources" (Art. 6) and "halting biodiversity loss by 2010" (Art. 6.1), and "a strategic integrated approach, incorporating new ways of working with the market, involving citizens, enterprises and other stakeholders" (Art. 14).

I.2. Governance and sustainable development

Governance could be defined as the interactions among structures, processes and traditions that determine how power and responsibility are exercised, how decisions are taken, and how citizens or other stakeholders have their say. While good governance can be seen as an end unto itself, it is also a process that can be undertaken by any number of actors, and is not solely tied to the institutions of government (Graham, Amos, Plumptre, 2003). Many agents can be involved in governance, such as the citizens, the government, the private sector, the civil society. The concept is particularly relevant in four areas, the governance in 'global space', or global governance, the governance in 'national space', the organizational governance and the community governance (Graham, Amos, Plumptre, 2003).

I.3. The ecosystem management approach and governance

The ecosystem management approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (Sheperd, 2004). It is based on the application of appropriate scientific

methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many ecosystems. The ecosystem management approach provides an integrating framework for assessing governance modes and structures. The approach incorporates three important considerations:

(a) Management of living components is considered alongside economic and social considerations at the ecosystem level of organization

(b) If management of land, water, and living resources in equitable ways is to be sustainable, it must be integrated and work within the natural limits and utilize the natural functioning of ecosystems;

(c) Ecosystem management is a social process (Olsson, Folke, Hahn, 2004). Thus, the interested communities must be involved through the development of efficient and effective structures and processes for decision-making and management.

In recent years the conservation of biodiversity and sustainable development has been recognized as a supplementary objective in the ecosystem management objectives. In order to achieve sustainable development, new governance models and structures are being testified beyond the traditional approach of command and control regulation by the government. These new models are developed in accordance with the Rio requirements (Dernbach, 2003) for public-private partnerships which include various forms of collaborative management (NGOs, private sector, international economic organizations, local communities etc).

II. Methodology for sustainable management of our natural resources

GEM-CON-BIO is a FP6 running funded project under Priority 7 – Citizens and Governance in a Knowledge-Based Society. It brings together 9 partners from 7 European countries in order to identify the different ways in which we can sustainably manage the global natural resources.

II.1. Identification of governance types and critical management characteristics

As a starting point, we identify that biodiversity is the basis for the successful provision of ecosystem services and therefore a key component of sustainable development. The biodiversity that supports our communities is affected by all levels of governance and all the groups of actors involved.

First and foremost the biodiversity does not recognise administrative or political borders. The impacts made in one region are felt in others. Thus, we have to consider the governance issues for sustainable development and conservation from the local up to the European level including each of the groups of actors (public, private and policy).

According to the United Nations Development Programme (UNDP), governance is the “exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences” [5]. Moreover, in UNDP terms, good governance is a situation where the three principle arms of governance – economic,

administrative and political – are accountable, transparent and participatory. Thus improvements to governance include increased availability of public information, transparency and accountability in decision-making, fair treatment of societal concerns, equitable sharing of the costs and benefits of conservation, strategic vision and actual effectiveness of management.

In order to identify what constitutes "good governance" in the context of biodiversity conservation, we must answer some crucial questions such as what types of governance are related to ecosystem management, what principles can help us understand and evaluate them in terms of conservation effectiveness and sustainable development, what are the similarities and differences between governance modes and processes, which factors and constraints generate over-performers and under-performers and how can policy changes foster sustainability.

As key principles of good governance we have adopted a) legitimacy and voice, b) direction, c) performance, d) accountability and e) fairness all of which are based on the UNDP's list of the characteristics of good governance.

We start with the general objective (end) of sustainable development, which can be seen as the integration of four more specific objectives in the management of an individual ecosystem area, a) the conservation of endangered species or habitats of local, national or international importance, b) the scientific research, c) the generation of direct income/benefit from ecosystem services (forestry, agriculture, fisheries, recreation, etc) and d) the generation of indirect income/benefit from ecosystem services (soil fertility regulation, water filtration, aesthetic, spiritual etc). In order to meet these objectives, governance includes the exercise of a number of different types of powers (planning powers, regulatory powers, spending powers, revenue-generating powers, and the power to enter into agreements). Good governance is about the responsible exercise of these powers (means) in order to meet the objectives (ends) (Graham, Amos, Plumptre, 2003).

Based on the understanding of the above concepts and definitions, we are developing specific criteria to identify "good governance" modes and processes to achieve sustainable development, since we recognize that "good governance" is essential for the successful application of the ecosystem management approach.

We are primarily concerned with ecosystem management with a view to sustainable use, as it is practiced by local communities or private owners, or through collaborative management with the government. We then acknowledge four different ecosystem management systems, a) the government management, b) the multi-stakeholder management, c) the local community management and d) the private management. Finally, we will address critical management characteristics such as governance characterisitcs (ownership, management authority etc.), size of managed lands, management characteristics and characteristics at the species level, economic and social questions and conservation result.

II.2 Case studies

The next step is the actual research based on a range of different case studies in seven different countries. The selected studies differ in terms of governance types and in their success in terms of sustainability objectives and will provide the tool to identify which governance modes foster conservation of biodiversity and sustainable development and under which conditions. In order to adequately address the governance issues at

different levels, case studies are partly intensive and local, and partly extensive and pan-European. A set of case studies from the US is also analysed in order to provide information on instruments and governance modes for which the European experience is limited, but there is a strong tendency in Europe to experiment with them at the moment.

For each case study the researchers have identified areas that have a range of biodiversity and land use practices; from strict nature reserves, to mixed use areas and buffer zones to agri-environmental schemes within agricultural lands. The key was to ensure a range of areas and equivalence across case studies. For all case studies we will 1) analyse environmental targets (with special respect to biodiversity), ecological and socio-economic conditions, pressures, and preconditions and approaches to reach these targets (e.g. governance, management characteristics), 2) assess the conservation results achieved up to now, 3) prognose the future development of the test areas, 4) identify (positive / negative) factors influencing the success of nature conservation in these areas / cases, 5) compare the effectiveness and efficiency of different approaches (incl. governance types), 6) give advices to improve the preconditions (political and socio-economic factors) for biodiversity conservation.

The case studies focus on the link between organizations and institutions underlying the management of the ecosystem and the capacity of the ecosystem to generate ecosystem services. Factors to be examined will include the ecological knowledge and understanding of ecosystems and their dynamics, the manifestation of such knowledge in management practices and management organizations, the incorporation of these management practices and organizations into different societal levels, and the social legitimacy and adaptive capacity of these management practices and organizations.

Detailed information to be collected and assessed for each case study includes different combinations of ownership and management for ecosystems areas, a detailed study of ownership and management design for a selection of cases representing different combinations of ownership and management, ecologic evaluation of the cases in terms of their production of ecosystem services, economic evaluation by relating the ecosystem service production to the costs of realizing and maintaining these services, social evaluation by relating the local participation and social conditions in the area, including benefit-sharing issues and a comparative analysis indicating the performance of different combinations of ownership and management.

The case study research will result in a systematic evaluation of governance successes/failures across a diverse set of international case examples. In addition, the case studies will be used to assess the robustness of the following process (modified as suggested by the case study results) to help policy makers adapt/implement market-based sustainable ecosystem management approaches most suitable to their particular circumstances.

II.3 Development of governance matrix

GEM-CON-BIO also conducts a research to identify the conditions that would render a governance system more appropriate for a given ecosystem. This is reflected in a governance matrix, linking governance types and critical ecosystem management characteristics. Furthermore, GEM-CON-BIO sets out general principles of good

governance and related criteria which, to the extent possible, will be relevant and applicable in a wide range of circumstances. These principles and criteria will be available in a policy guidance document, which will codify and present all the project's results.

The following governance matrix (table 1) will be used as the basis of our analysis:

Table 1: Governance matrix

Governance types												
Ownership	Transboundary		Public							Private		
Management	International management		Government			Delegated				Private		
	Global	EU	National	Regional	Local	Multiple	NGO	Community	Commercial	NGO	Community	Commercial
Case 1						X						
Case 2							X					
Case 3									X			
Case 4										X		
Etc.											X	

Based on the answers to the above questions, an analytical framework will be derived to help us understand the critical characteristics that exist in all the studied cases. This framework will be used to assess governance modes in terms of feasibility and potential conservation success, and will help to identify the critical elements and threshold factors that will need to be present in governance structures in order to be successful. It will also identify the constraints that will deprive a structure from being economically, financially or socially successful, while attaining conservation goals, and highlight the opportunities for the local communities to become involved in the management of their environment.

III. Conclusion

Biodiversity is the basis for the successful provision of ecosystem services and therefore a key component of sustainable development. It must be approached in a multidimensional way reaching all levels of governance and all the groups of actors involved.

GEM-CON-BIO develops a methodology for the achievement of sustainable management of our natural resources by understanding what constitutes "good governance" and by identifying the critical characteristics and threshold factors. Their interrelations have generated a governance matrix linking governance types and critical ecosystem management characteristics that are used in the research on a great range of case studies and will present "success" and "failure" scenarios of different approaches in Europe and USA. Our scope is double, first to demonstrate whether good governance practices lead to better outcomes and second to disseminate the results to those involved in the formulation, implementation, monitoring and evaluation of policies - at the European, national, regional and local level, involving public authorities, legislators and citizens and their organisations.

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