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2 Integrative Management of Protected Areas – a New Scientific Discipline?

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2.1 Introduction

Is the "management of Protected Areas" a new scientific discipline, or just a collection and practical application of elements of other scientific fields such as biology, ecology, economics, management science, and humanities? The emergence of a new "discipline" (even if inter- and transdisciplinary approaches prevail) can usually be observed by the acceptance of field-specific textbooks, scientific papers and studies of the subject, and education offers specifically addressed to the discipline. In the light of this definition of a scientific discipline, it is useful to sketch the history of Protected Areas as a major field of activities – both scientific and political.

A "protected area" is land (area) set aside for specific purposes of conserving natural (and often also cultural) heritage, according to IUCN (World Conservation Union): "... land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means" (IUCN, 1994). The basic idea of Protected Areas stems from imperial hunting sites where the aristocrats could go for hunting trips and would have high chances of hunting success. However, the conception of Protected Areas has, of course, significantly changed over time. The imperial hunting sites as well as feudal or colonial hunting reserves were meant to exclude unauthorized hunting and "protect" wildlife from illegal (non-aristocrat) hunting.

The first Protected Areas in the sense of conservation for purposes other than hunting were natural monuments, and the national parks established in the USA in the 19th century (e.g. Yellowstone National Park, 1876). Natural monuments and national parks were important not only from the viewpoint of conservation but also in the sense of national heritage and pride. Other early prominent examples include the

conservation of the forests the capital city of Austria, Vienna, which were protected from development and conventional forestry in 1872.

The complexity of establishing and managing Protected Areas has increased since then, with the starting point of conserving biodiversity – genetic, species, ecosystem and landscape diversity – to enhancing economic development, secure cultural and social systems in peripheral regions (both nationally and world-wide), and to promote sustainable development. This range of potential aims of Protected Areas has been developed over time, resulting in a broad range of tasks for managers of Protected Areas such as ecological management, education, communication, business management and administration.

The establishment of Protected Areas has only rarely been an issue of biodiversity alone. Even in the "old days" of US national parks, these Protected Areas gained importance for the national self-esteem as well as, already very early in the 20th century, for the tourism industry. Protected Areas carry a big load of aims and arguments that mirror economic, but also social and cultural developments. Besides the aim to conserve biodiversity, Protected Areas have been connected to "cornerstones of sustainable development" (World Bank, 2003), "pillars of regional and national identities" (Bonaiuto et al., 2002), "regional sustainable development" (Mose, 2007), contributing to conflict resolution in "peace parks" (Ali, 2007), and are "learning sites" for science and social development.

Parallel to the development of the aims of Protected Areas, the expectations and demands towards Protected Areas have grown rapidly. For instance, Protected Areas have been labelled "landscapes of hope" for underdeveloped regions (Mose, 2006).

Besides these labels and aims of Protected Areas, a huge variety of legal categories, definitions and aims of Protected Areas have been developed, among others IUCN's categorization, international conventions (e.g. Convention on Biological Diversity, CBD; RAMSAR convention for the conservation of wetlands), European Union's Natura 2000 regulation (Habitat and Birds Directives), national, regional and local regulations on nature conservation. Nearly all these regulations include not only the conservation of biodiversity in their portfolio of objectives, but also reference to other issues such as education, science, information, visitor experience, and economic development. For instance, IUCN's national parks according to category II of the IUCN system refers to the conservation of biodiversity and the natural processes in an ecosystem, as well as to education and information, visitor management, and scientific research.

With the manifold aims and objectives of Protected Areas, the task of planners, managers and administrators in the field of Protected Areas is not only one of natural sciences (e.g. biology and ecology), but includes the full range of management

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instruments and processes of companies (firms) with the special purpose to conserve biodiversity while sharing benefits with all stakeholders. This wide field of aims and activities of Protected Areas has been acknowledged by the Convention on Biological Diversity by addressing the issues of benefit sharing, stakeholder involvement, and sustainable use of resources, and sustainable development.

Discussing the concept of and challenges for Protected Areas is certainly a very interesting venture. While the number of Protected Areas and networks of Protected Areas has grown rapidly[1] during the last decades, public awareness also increased dramatically. With more and more land devoted to nature conservation, stakes are high for all stakeholders such as land owners (private and public), holders of property rights (such as fishing and hunting rights), local and regional communities, NGOs (Non-Governmental Organizations), politicians and, generally, all tax payers.

Despite the fact that Protected Areas are prominent in terms of their importance for biodiversity conservation and sustainable development, there is a lack of a general theory of Protected Areas. Currently, only a handful of textbooks touch upon the variety of different fields of activities of Protected Areas, mostly from the viewpoint of Conservation Biology. Furthermore, there are a number of journals devoting at least some space to the management of Protected Areas, in many cases picking out a disciplinary aspect such as Ecological Economics, Conservation Biology, Journal of Nature Conservation, Journal of Wildlife, and Journal of Environmental Management. Textbooks concentrate on a broader view of PA management (see for details of the following Getzner, 2007). While the "Conservation Handbook" (Sutherland, 2006) addresses biodiversity conservation from a closer biological viewpoint, and includes only partially other topics such as economics and business administration, two major volumes cover most of the topics interesting for planners and managers of Protected Areas. The more general volume, "Protected Area Management – Principles and Practice" (Worboys et al., 2005) adresses PA management not only from an ecological viewpoint but includes, among other topics, management, communication, visitor steering, benefit sharing, and indigenous people. Similarly, "Managing Protected Areas" by Lockwood et al. (2006) covers as well most of the ground of PA management with a comprehensive "global view". A recent practical overview has been provided by Alexander (2008). These textbooks (some of them with with 800+ pages) are major introductions and should not be missed on any bookshelf of PA managers. However, some European specifics are not dealt with, for instance, the details and management consequences of Natura 2000 sites and networks are

1 For instance, the number of sites in Europe according to the Habitats and Birds Directive has grown to currently over 27,000 sites in countries of the European Union.

not touched upon, and "paper parks" in transition countries of Central and Eastern Europe need specific attention in the grey zones of corruption, lack of public funds, and low awareness regarding natural heritage.

2.2 The management of Protected Areas as a new discipline

The management of Protected Areas is certainly a rising professional field due to the high demand for educated and skilled personnel in many European regions. Not only has the number of Protected Areas with significant global importance, such as National Parks and Biosphere Reserves, increased, but the new regulations towards Natura 2000 sites, and national developments such as Nature Parks, have created many sites on paper for which management schemes and administrations have to be established in the next few years. While the job description becomes clearer, the manifold aspects of this professional demand for PA managers manifest itself only slowly in forming a scientific discipline. This is probably due to the wide range of topics and issues, and also personal skills, which a manager of a protected area should be aware of. First of all, the question arises what a protected area really is from the viewpoint of management and economics. There is no similar organization like a protected area which focuses on natural science (biology) and at the same time involves a broad range of management topics.

We like to conceive a protected area as a firm in classical economic terms as an institutions organizing production, with a broad range of inputs (factors of production), such as personnel, infrastructure, land, but also information and collaboration from a variety of stakeholders. The outputs (products) of this firm are, for instance, biodiversity conservation, sustainable development, economic and other benefits, information, education and raising public awareness. A protected area is from its very nature a not-for-profit company but rather tries to achieve its goals – often stated in the laws and establishing documents of the protected area – with the minimum intake of resources. Protected Areas as special purpose firms (companies) produce on the one hand public goods (biodiversity conservation) – financed through public funds –, but also partially private goods (such as exhibitions and information materials, local and regional produce), and meritory goods (education). Many goods produced are of mixed character in between these classifications.

The most important disciplines contributing to a "science of the management of Protected Areas" are

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sition, survival strategies, and threats to biodiversity, often with a local focus (such as Alpine vs. desert ecosystems, marine vs. land ecosystems).
- management and business administration: PA managers are "managers" in the classical sense and have to apply knowledge, among others, on business organization, personnel, marketing, accounting, communication.
- management of public enterprises: This discipline on the interface between management and business administration, and (micro-) economics, contributes to the distinct character of companies being organized possibly as a profit-oriented company, but nevertheless have to deal with bureaucracies, public money and accounting rules, and with legal and other formal obligations.
- ecological economics: The "science of sustainability" is an often neglected discipline as many PA managers studied biology, ecology, or landscape planning, but do not have basic economic knowledge. Ecological economics contributes to the understanding of the relations between the ecological and economic system, and provides many important elements such as economic valuation of natural goods (species, ecosystems).
- culture, philosophy, sociology: These disciplines provide the basic understanding of reasoning of biodiversity conservation in a cultural, and social and societal context, focusing on the embedding of Protected Areas into the economy and society.
- education sciences: The presentation of information, providing insights into ecosystem dynamics, and educating visitors is a major task of Protected Areas.
- planning science: The structure of a planning process, and the importance of goals, objectives, aims, measurability of outcomes, logical frameworks etc., contribute much to ecological management plans.
- psychology, group dynamics: Dealing with the manifold expectations of all stakeholders involves the broad range of communication and inclusion of different opinions and viewpoints. PA managers often have to contribute soft skills such as organizing workshops, resolving conflicts, and dealing with diverse personalities.
- law and legal science: As many aims and goals of Protected Areas are codified in public law, PA managers have to base their decisions on firm legal ground.

The forming principles of the "science of management of Protected Areas" are depicted in Figure 1. It becomes clear that the forming principles of this new science include both positive and normative perspectives. For instance, sustainable development is on the one hand considered as a positive concept in the sense that ecological, social and economic aspects of development are analyzed, and that the development

of a protected area over time is evolutionary and process-oriented in its very nature, presenting both a certain target (state) as well as the process. However, sustainable development is also considered a normative concept in the sense of prescribing a certain policy goal, or at least, principles for achieving the right path and perspectives towards the long-term goal of sustainability. The positive and normative character of the management of Protected Areas can also be found in other forming principles such as ecological effectiveness and economic efficiency. Both can be analyzed from a positive perspective (e.g. natural science methods for analyzing ecological effectiveness and economic efficiency of a certain environmental management scheme), but are also central normative goals to be achieved. Policies of PA management have also to be (normatively) judged by their effectiveness in ecological and economic terms.

Other forming principles include inter- and transdisciplinarity. Interdisciplinarity has already been discussed above by highlighting the importance of several scientific disciplines to be included in the work, education and research agenda of PA management. However, in many cases, knowledge needed for effective and efficient PA management can only be generated during the planning and decision process in a transdisciplinary way together with all stakeholders. For instance, the effects of a certain ecological policy can often not be analyzed by research in an ivory tower-like setting but have to be assessed by relevant stakeholders who hold local and regional tacit knowledge which is not codified (e.g. many local biotopes may not be registered accordingly for the problem in question). The management of Protected Areas as a new discipline can therefore be labelled "post-normal science" (Funtowicz and Ravetz, 1994).

While the forming principle of the long-term and intergenerational perspective is somehow self-explaining – by including concepts such as biodiversity, dynamics, and also ethical aspects –, it has also to be stressed that internationality and the proper consideration of the global nature of many problems of Protected Areas is crucial for successfully managing a PA. For instance, providing biodiversity can be considered as providing a global public good (genetic and species diversity). Management principles, practices and instruments can often be used in different national contexts, and problems of biodiversity conservation are not limited by national boundaries ("peace parks", "inter-national parks").

Identification and sharing benefits is a major issue particularly in developing countries. Poverty is generally considered one of the main drivers of biodiversity loss (Hassan et al., 2005). Enhancing regional development and providing and sharing benefits for the local residents in peripheral regions is therefore a crucial principle if ecological management should be successful. The process-oriented character

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of PA management is comprised by the forming principle of communication, participation, and good governance. One could add "empowerment" as an additional aspect since Protected Areas sometimes also involve social groups at the fringe of society. Participation may theoretically be reasoned, for instance, by the approach to procedural rationality and discursive ethics (O'Hara, 1995).

Finally, the Protected Areas may contribute significantly to innovation in several fields such as ecology, management, and political science.

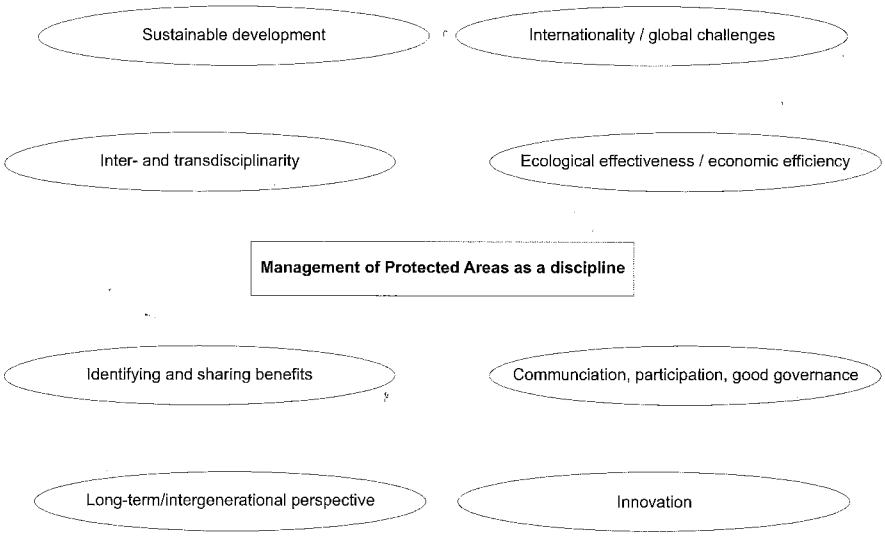

Figure 1: Forming principles of the Management of Protected Areas as a discipline

2.3 Summary and conclusions

Summing up, the management of Protected Areas can be considered a inter- and transdisciplinary venture, taking the manifold achievements of other disciplines and combining these in a new framework. It can be considered as a new "discipline", or it can be considered as presenting many elements from natural, economic, and management science approaches. Nevertheless, the fields of work for PA managers includes all these different elements. Out of these, new education, training, and research options emerge that highlight the need for specific and cross-section knowledge and skills.