Co-management Across Levels of Organization: Concepts and Methodological Implications.

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There is a growing literature on social-ecological linkages and sustainable use of natural resources. This research can be divided into two broad categories. The first category consists basically of case studies that reveal the existence of an extremely rich variety of systems of management of common-pool resources. The second type of research sets out to find empirical and theoretical support for the prospects of suggesting, and deliberately building management systems that fulfill well-known criteria for sustainable use (Burger et al., 2001; Berkes and Folke, 2002). In both types of research, the concept and principles of *co-management* have been an integral part. This paper is based on the presumption that the two lines of research could be merged and synthesized. The paper deals with three broad questions.

1. What is co-management and how should the phenomenon be understood?
2. What is co-management good for?
3. How can real-life instances of co-management be investigated and analyzed?

What is Co-Management ?

Collaborative management, or co-management has been defined as "the sharing of power and responsibility between the government and local resource users," (c.f. Berkes, George, and Preston, 1991:12). The concept is often equated with joint management, shared management, participatory management, multi-stakeholder management, etc. The Comprehensive Bibliography of Common-Pool Resources at Indiana University, US contains thousands of references that explicitly deal with the issue. However, co-management studies seem to have been conducted at a faster pace than they have been analyzed, and the field is thus weak in terms of theory (Berkes, 1997, 2002; Carlsson, 2001).

Co-management can be understood as "a situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources" (Borrini-Feyerabend, Farvar, Nguinguri and Ndangang, 2000:1). The idea is that an agency with jurisdiction over an area (usually a state agency) might develop "a partnership with other relevant stakeholders (primarily including local residents and resource users) which specifies and guarantees their

respective functions, rights and responsibilities with regard to the [area]" (Borrini-Feyerabend, 1996:8).

Pinkerton utilizes two different models to conceptualize co-management between, what she calls folk managed systems and state managed systems. On the one hand there is a "*horizontal* continuum from nearly total self-management to nearly total state management". On the other there is a "*vertical* contracting out model of state management" powers which is characterized by devolution of rights (Pinkerton, 1994b:322–25, emphasis added). This way of reasoning has proven fruitful for analyzing a number of problems that are associated with management of CPRs (Pinkerton, 1989, 1994a).

Co-management can be looked upon as a continuum from the simple exchange of information to formal partnership. In this paper we do not discuss where on this scale the possible optimum may be. Such judgments, if possible, depend on how one considers the trade-off between different criteria for success. For instance, it is likely that economic efficiency objectives will be at the expense of equity objectives (Ostrom, Schroeder and Wynne, 1993: 116 ff.). Co-management presupposes that parties have, to some extent, agreed on an arrangement, but the arrangement often evolves. It has been emphasized that co-management should be seen as a process rather than a fixed state (Beck, 2000:4).

If one regards the State as one among a set of stakeholders, a yet another definition of co-management may be proposed: "the sharing of responsibilities, rights and duties between the primary stakeholders, in particular local communities and the nation state; a decentralized approach to decision-making that involves the local users in the decision-making process as equals with the nation-state" (The World Bank, 1999:11). This definition is illustrated in Figure 1. In essence this is the same definition as the one adopted by the World Conservation Congress, Resolution 1.42: "a partnership in which government agencies, local communities and resource users, non-governmental organizations and other stakeholders negotiate, as appropriate to each context, the authority and responsibility for the management of a specific area or set of resources" (IUCN, 1996).

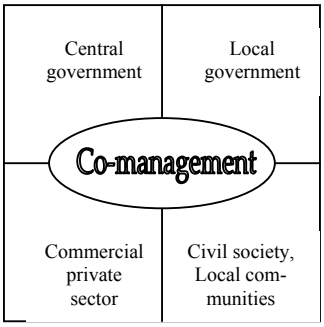

Figure 1. Stakeholder Categories and Co-Management (Source: The World Bank, 1999: 11)

Thus, the definitions listed so far have some common underpinnings.

- They regard co-management as some kind of partnership between public and private actors.
- They explicitly associate the concept with NRM (natural resources management).
- They stress that co-management is not a fixed state but a process that takes place along a continuum.

It has been argued that mainstream definitions of co-management have problems in capturing the complexity and variation in contemporary systems of governance (Carlsson, 2000). For instance, within the same resource system, different management tasks can be subject to different couplings and agreements with the state. In fact, it can also be the case that different parts of "the State" have different agreements or collaborative connections with a given community. This will be discussed later in the paper.

In order to investigate the concept more thoroughly we might ask the following question: What do we mean really, when regarding co-management as some kind of process between public and private actors, e.g., between the State and a local community of resource users? Figure 2 illustrates four different alternatives. The *first* version describes co-management as some kind of relation between separate spheres of dominance fraternizing with each other ("the State" and a "private sphere"). This conceptualization of co-management includes exchange of information, goods and

services. In essence, it is the lower steps of Arnstein's ladder (Arnstein, 1969). For the sake of simplicity, we do not distinguish between local, regional and central public authorities. All are included in the sphere labeled with a capital "S". However, it should be remembered that the state as well as the private sector encompasses a rich variety of organizations and units.

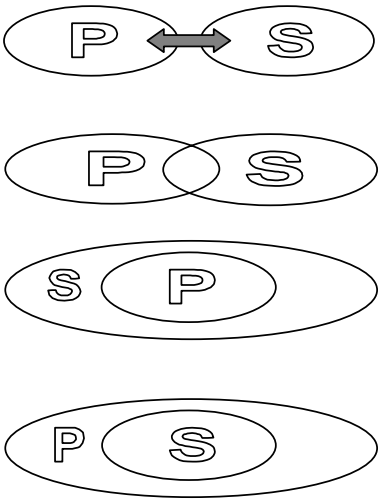

Figure 2. Five images of Co-management

The *second* image of co-management is depicted in Figure 2 as overlapping sectors. According to this view, co-management is a matter of the intercepting part of the spheres. For instance, representatives of the State and groups of resource users might form joint management bodies or cooperative units and they might participate in joint decision making. According to this image of co-management, each sector keeps its authority and its relative autonomy. Thus, co-management could be envisaged as the creation of a formalized arena for cooperation. However, public authorities and stakeholders sometimes form quasi non-governmental organizations where borders between sectors are blurred. In this case, it is an open question whether one can talk about separate spheres of authority.

The two subsequent images of co-management illustrated in Figure 2 can be labeled "nested". The left one of the two represents a rather common situation. The State might be the *de facto* holder of all the legal rights in a certain area or a particular resource system. The private actors might be entrusted e.g. with the right to manage or appropriate resources on state owned land or on state owned fishing grounds. The

utilizers might set up independent organizational units that have a substantial degree of independence. For instance, many fishing systems have this quality and the same goes for the reindeer husbandry in Scandinavia or forest commons in Norway.

The other form of nested systems has a similar but reversed structure. Here the state operates within the realm of a "non-public" sphere, and resource users might exercise all legal rights associated with an area or resource system. For example, forestlands, fishing grounds, or grazing lands may be legally owned by individuals, or by groups of users. However, the State can put a number of restrictions on the management of these systems. For example, State authorities often put restrictions on and monitor private logging enterprises, and they set up bodies to regulate and coordinate private fisheries. From these examples one should not draw the conclusion that this type of co-management always implies that the State exercise its authority towards hesitant or resistant private actors. Even though state agencies may monitor and exert authority for purposes of taxation or law compliance, this form of fraternizing might as well be based on mutual agreements. It is well-known that appropriators and resource holders often have a need for so-called third party solutions. These are often provided by the state and other public authorities.

Finally, it should be emphasized that the four types of co-management that have been discussed so far can be combined and, in fact, are often combined. For instance, regular exchange of information can easily be combined with nested versions of co-management. Even if there are overlapping sectors, there might be a general need to set up joint groups. This may serve an introduction to the fifth image of co-management, here called the "mosaic model", Figure 3.

The *fifth* version of co-management appreciates the fact that the State is fragmented and has many faces. The state consists of numerous authorities and agencies that might be associated with different groups and functions of a resource system. In most societies, regional and local administrative actors have close relations with local groups or communities of users. It is also a well-known fact that many public authorities sell their services on a commercial basis, for example, the provision of seedlings from state nurseries. These considerations imply that "the State" should not be regarded a unity, neither by it structure, nor by its function (Carlsson, 2000a, 2000b; Ostrom, 1985).). Thus, the fifth version of co-management encompasses the idea that in many real-life cases, we can expect to find rich webs of relations and agreements linking different parts of the public sector to a similarly heterogeneous set

of private actors, all within the same area or in the same resource system. This is illustrated in Figure 3.

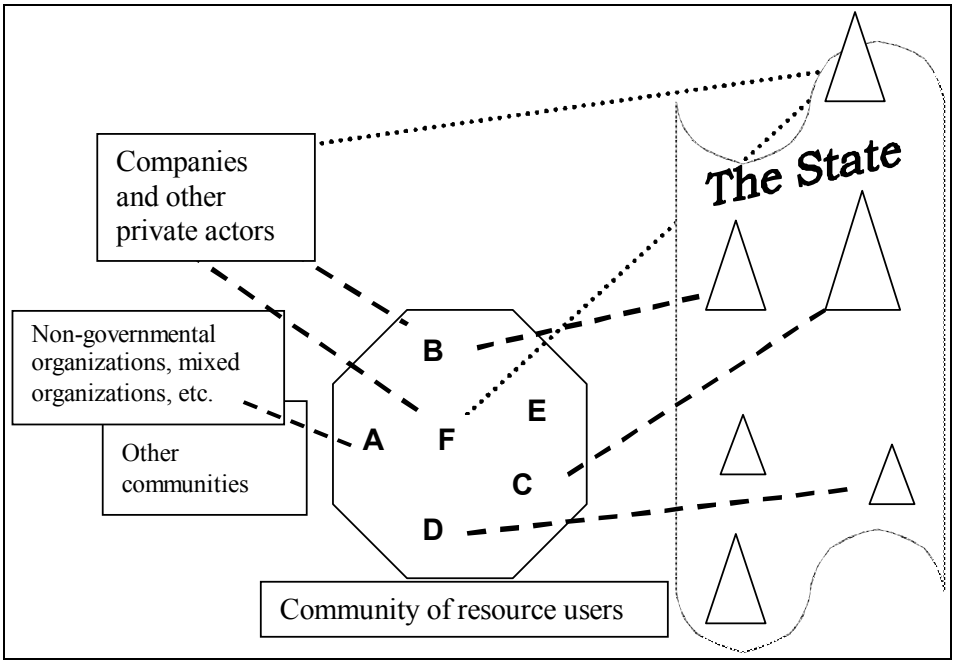

Figure 3. Example of a co-management network.

It should be obvious that this latter image of co-management makes everything more complicated. What are the implications of this? If co-management is everything, it might as well be nothing? Perhaps the concept of co-management dissolves only to be resurrected and dressed in another, and perhaps more suitable, terminological clothing? One obvious candidate for this is the concept of governance.

Understanding Co-Management as Governance

Borrini-Feyerabend argues that the notion management, in association with co-management, should be understood "as a process by which a site […] is identified, acquired and declared; relevant institutions are built and/or enter into operation; plans are designed and implemented; research is undertaken; and activities and results are monitored and evaluated, as appropriate" (Borrini-Feyerabend, 1996:8). This is a very broad definition that may include a wide range of activities. By contrast, Short and Winter (1999) prefer to restrict the term management, to day-to-day activities rather

than to decision-making structures or administrative systems. However, this latter view of management does not pay any attention to the fact that all resource management regimes are embedded in a wider institutional context.

This idea of embeddedness is one of the cornerstones of institutional policy analysis (Ostrom, 1990, Imperial, 1999). Kiser and Ostrom (1982) emphasize that three layers of rules (constitutional rules, collective choice rules and operational rules) shape every institutional arrangement. Constitutional rules specify who is eligible to have access to a resource and share the benefit of its use. Collective choice rules regulate how decisions are made, for instance, in order to decide the level of harvesting or the technological input. Operational rules regulate the daily activities, e.g., the intensity of harvesting or methods of cultivating. The three layers of rules form a hierarchy, with the rules on a higher level deciding the degrees of freedom for those on the lower.

> Constitutional decisions establish institutional arrangements and their enforcement for collective choice. Collective decisions, in turn, establish institutional arrangements and their enforcement for individual action. [...] Constitutional choices precede and constrain collective choices (Kiser and Ostrom, 1982:209-210)

This means that the constitutional level can be understood as a system of rules specifying the terms and conditions of governance, while governance itself "includes the setting of rules, the application of rules, and the enforcement and adjudication of rules" (Feeny, 1988:172). Even though co-management might be demonstrated in the day-to-day activities (guided by operational rules) of a community of users, these are performed under the umbrella of collective choice rules. Thus, constitutional rules set the framework for decision making on the middle level where co-management is predominantly exercised. However, if constitutional issues are unclear about regarding who has the legal right to be a member of a community, this would of course affect the possibility to reach binding co-management agreements among parties.

One possible consequence of this discussion is that systems of co-management, especially as they are understood to be the model in Figure 3, might as well be described as systems of *governance*. However, like co-management, the conceptualization of governance is somewhat unclear. One line of research prefers to

restrict the concept to the attempts by the State to adapt to its environment. But a more common use of the concept reserves the notion for the societal coordination of social systems. These processes may or may not include the State; hence, governance is possible even without a government. "Thus, in the first approach, which could be labeled state-centric, the main research problem is, to what extent the state has the political and institutional capacity to 'steer', and how the role of the state relates to the interests of other influential actors; in the second approach, which is more society-centred, the focus is on co-ordination and self-governance as such, manifested in different types of networks and partnerships" (Pierre, 2000:3).

This is how most co-management systems may be understood, namely, as governance structures. These structures might be composed by a rich variety of actors coupled to one another by a significant numbers of relations involving the State, local resource users, commercial actors, NGOs, and a whole range of other public and private actors. Thus, real-life co-management systems might as well be described as *networks* that, according to their qualities, can be labeled differently. Although, it is not the topic of this paper to dig into this line of research it can be indicated that some co-management networks may have the quality of *epistemic communities*, that is, "network[s] of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area" (Haas, 1992: 3). For instance, local fishermen in close cooperation with scientists and public officials manage many fisheries. Other co-management systems can be described as *issue networks:* "shared-knowledge group[s] having to do with some aspect (or, as defined by the network, some problem) of public policy" (Heclo, 1978: 103). Another network concept that might capture what we want to describe is the *policy community,* a label for "shared experience, common specialist language, staff interchange, and frequency and mode of communication" (Hogwood in Jordan, 1990: 327). A policy community is "a special type of stable network which has advantages in encouraging bargaining in policy resolution. In this language the policy network is a statement of shared interests in a policy problem: a policy community exists where there are effective shared 'community' of views on the problem" (Jordan, 1990, p. 327).

In accordance with the same idea, Cash and Moser (2000) have launched the concept *boundary organizations*. These are assumed to represent a type of

institutional arrangements that have the function of mediating between scientists and decision-makers, and between these actors at different scales.

To summarize, most instances of collaborative or joint management of natural resources are more complex and sophisticated than might be concluded from the mainstream image of co-management defined as the sharing of power and responsibility between the government and local resource users. Exchange of information, allocation of resources, as well as a number of other couplings, including more formal agreements, make up particular webs of relations among different actors. These webs have different qualities that can be described in different ways. However, they should be understood as *governance systems* and as such they literally govern specific areas or resource systems. The very co-management of fisheries, forests, grazing land, and other local resources is the visual and substantial outcome of these governance systems.

We do not argue that the concept of co-management should be replaced, only that it may be more enlightening to think of existing webs of co-management as governance systems. What is the advantage of conceptualizing co-management as governance systems and networks? This will be discussed in the subsequent sections of this paper. We might start this discussion by restating one of the questions in the introduction of the paper: –What is co-management good for?

What is Co-Management Good For?

Why has co-management been looked upon with such positive connotations? The immediate answer is simple; co-management exists. Local users alone can hardly manage most natural resources. At the same time, we have overwhelming evidence that centralized management of local resources is problematic. Even very centralized systems are dependent on the local level, for example, for the knowledge and skills of local users. Since many resource management systems are cross-scale, different management problems must be solved simultaneously at different levels (Berkes, 2002). Obviously, some kind of allocation of tasks is necessary. Thus, co-management, as broadly defined, is probably the rule, rather than the expectation, and we should expect to find a substantial variety of arrangements.

Pinkerton (1989) has discussed a number of benefits that may be achieved by establishing well functioning co-management systems. Without repeating her argumentation, it can be concluded that co-management has proven to be a good

solution to many problems associated with management of common-pool resources. However, before suggesting co-management as a general remedy for various CPR problems, one must ask if the call for co-management is caused by the fact that power has been taken away from the local community in the first place. If so, contracting for example out might as well be an attempt of state authorities to increase the legitimacy of their domination. To offer a co-management agreement might, in fact, be a means of codifying an existing situation, or it might be an attempt by the state to offload a regulatory function too costly to manage. Thus, co-management is not good or bad *per se*. What is it good for then?

Allocation of tasks: As indicated above, many existing management systems are neither small-scale nor large-scale arrangements. For example, marginalized producer groups in remote areas of the world need external markets for the realization of the value of the goods they produce. But, they need links to the market through persons who know the structure of the demand, or have access to different types of commercial networks. This is only one example of allocation of tasks, but the principle is something that permeates all types of co-management systems. Division of labor enables specialization to increase efficiency.

Exchange of resources: Local groups may have a need for certain types of resources that they are themselves unable to provide, such as technology, scientific expertise, and a diversity of information. But, they may possess resources needed at the center, such as information about harvesting volumes or status of the resource. If we consider that co-management systems not only consist of relations between a community and the State, but may be composed of a number of couplings among a rich variety of actors, is easy to imagine that the web of resource dependences is likely to be far more complicated than indicated. In fact there exist two complementary theories that explain why networks emerge. The first is the theory of power relations and the second is the theory of resource dependency (Thrasher, 1983; Thrasher and Dunkerley, 1982). Both are relevant for explaining how co-management is understood in this paper.

Linking different levels of organization, cross-scale linkages: Co-management is means of linking different levels of organization. According to Max Weber's image of bureaucracy, different layers of organization are linked to one another within in a framework of coherent hierarchy. Co-management, by contrast, is a process by which representatives from different levels of organizations coordinate

their activities in relation to a specific area or resource system. In practice it means that, for instance, state employed experts might work in concert with the board of a local community of resource users. In comparison with hierarchic ways of organizing management, the latter is more responsive to local circumstances. It is also likely that the flow of information is faster and more effective and that problems are addressed at a more appropriate level within the organization. In short, co-management agreements serve the purpose of constituting cross-scale linkages among organizational groups that might not be otherwise connected.

Reduction of transaction costs: "Transaction costs are the costs of measuring what is being changed and enforcing of agreements" (North, 1997). These costs can be divided into long-term and short-term costs. Empirically, it is not easy to distinguish between activities aimed at a long-term reduction of transactions costs or for more immediate purposes. One positive, but often neglected, effect of co-management is the possibility that well tailored co-management systems help reduce transaction costs. If, as we believe, most instances of co-management consist of fairly rich webs of relations, these networks have certainly evolved over time. If we scrutinize the function of individual links in these networks, we will find that they have to do with information, legal relations, and monitoring, features that are usually associated with the exercising of property rights. However, it is easy to appreciate that if (as a result of an agreement) representatives of State authorities are entrusted the right monitor the access to or appropriation of a resource, this will reduce conflict among members of the community. Consequently, users do not have to dedicate time and resources for solving these conflicts, thus reducing of transaction costs.

Risk sharing: It is a well-known fact that, for instance, many agriculture based communities tend to diversify their crops. This has the effect that they simultaneously uphold biodiversity and spread the risks, over time and within the same institutional arrangement (Colding, Elmquist and Olsson, 2003). If one crop fails, they still have a resource base for their subsistence living. In short, they do not put all eggs in one basket. The same type of reasoning can be applied to institutions and governance systems. Co-management implies that risks are in the decision making. Systems that are composed by single administrative units and practice monolithic decision systems are more vulnerable than are polycentric arrangements (Lowe, et al., 2000). This, logic can also be applied to co-management networks. Webs of relations that have evolved over time make up diversified management arrangements. These webs serve

the purpose of spreading the risk among involved parties. For example, it is less vulnerable to share some management tasks among a number of actors compared to rely on one actor for their accomplishment.

Conflict resolution mechanisms, power sharing: The establishment of co-management systems may function as a means of conflict resolution between communities of local resource users and the State. The processes of negotiation, bargaining and setting up co-management agreements that codify the rights and responsibilities of involved parties (local groups, the state, commercial actors, etc) reduce conflicts and might even function as a more long-term problem solving mechanism. Successful reduction of conflicts is essential for long-term planning and for the willingness among individuals to invest in creating appropriate institutions.

How Can Real-Life Instances of Co-Management be Investigated and Analyzed?

One main argument in this paper is that, although ecosystems, as well as institutional systems, show an endless variety our tools for conceptualizing and analyzing co-management are strikingly blunt. More research needs to be done in this area. Given that there exists a significant variety of ways in which commons institutions are linked, both across space and across levels of organization, two alternative approaches emerge. First, co-management systems might be mapped and analyzed with the presumption that they should be understood as a set of formal couplings between different levels of organization. Examples include formal and mutually binding agreements spelling out the sharing of power between the state, or other public authorities, and groups of resource users. This approach risks having the real-life actors regarded as external to the process, and in the worst case, only regarded as attributes to formally decided power-sharing agreements.

An alternative way of understanding systems of co-management is to start from the assumption that the parties are involved in a process of problem-solving, iteratively as in the process of adaptive management.. This presumption implies that research should preferably be task-oriented, and thus concentrate on the function, rather than the formal structure, of the system. Such an approach has the effect of highlighting that power-sharing is the *result*, not the start, of the process. It supports the observation of many researchers that co-management is the result of extensive

deliberation and negotiation –a process rather than a fixed state. This kind of research approach to co-management might employ the following steps.

1. Define the social-ecological system under focus: First we must define our unit of analysis, i.e., the group, community or resource system we are interested in. This is not a trivial task. For, example a single river might contain a number of valuable species that are utilized by many different groups. By the same token, all real-life communities rely on a number of different resources. However, because of practical reasons, the choice the researcher has to make is whether the organizing principle should be a certain group/community, an area, or a particular resource. Either way, the ambition should be to define and get a good picture of the action arena and how it is structured (Ostrom, 1990; Imperial, 1999).
2. Map the essential management tasks to be performed and the problems to be solved: The second step is to figure out how people behave in order to manage the resource. What are the activities that must be performed? How are these related? What types of short-term, medium-term, and long-term management decisions must be made, and who are entitled to make these decisions? What are the specific types of problems related to the access and appropriation of the resource? How are these problems solved?
3. Clarify the participants in co-management activities and related problem-solving processes: The third step is to figure out who participates in the activities listed under point two. This way we reconstruct the web of relations in the particular co-management system we are interested in. The logic is that we start from the "bottom", in the activities themselves, and try to figure out how management is organized, if power is shared, if rights and duties are contracted out and if State authorities have a "finger in the pie". In network analysis one separates between loosely and tightly coupled systems, i.e. whether relations are intermittent and spontaneous or frequent and perhaps regulated by law (Scott, 1994; Weick, 1976). Tightness of coupling is also revealed if one tries to capture how different relations and agreement are related to the management of the resource(s) under focus.

4. Analyze cross-scale linkages: After the system has been mapped, it can be analyzed, for example, by regarding how and to what extent the identified relations connect central levels of decision making to those of the local level. We will also understand how past practices relate to the present and how one geographical area is connected to another. In fact, all the points that were listed in the previous section can serve as criteria for analyzing the co-management system that has been mapped. If the analyst chose to investigate a whole resource system, such as a river basin, the same methodology can be used while comparing co-management systems among different groups utilizing the resource. This kind of comparative approach would be an excellent method for testing and generating theory.
5. Capacity building: In the fifth step, the goal is to identify features of the system that can be used for enhancing so-called capacity building. Capacity-building may be defined as the sum of efforts needed to nurture, enhance and utilize the skills and capabilities of people and institutions at all levels – nationally, regionally and internationally. It is based on a comprehensive view that emphasizes the importance of institutional arrangements, appropriate government policies and legal frameworks, and stakeholder participation. Capacity-building does not seek to resolve specific problems but rather seeks to develop the capacity within communities, governments and other organizations to resolve their own problems (Berkes, 2002). Here the idea is that, once the system under focus has been mapped and its network structure has been analysed, one can evaluate the particular features that can be used to empower people and to reorganize relevant institutions.
6. Prescription of remedies: Having identified features that might enhance capacity building, one can turn to the question of solutions. The goal of this step is to suggest what can be "done better". This does not mean, however, that the analyst should take on the role of solving particular problems for or on behalf of particular groups or political decision makers. It only means that the researcher should communicate his or her results to relevant groups in order to contribute knowledge for the general process of policymaking and problem solving. In fact, this idea fits very well with the old mission of policy analysis, as Harold Lasswell ones defined the task (Lasswell, 1968). In the end,

however, the whole question boils down to what one regards to be the mission of science. Is it to make life better or is it to pave the road to the ivory towers of academia? When it comes to research about natural resources management, we argue that the former is highly desirable.

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