Managing Tragedies: Understanding Conflict over Common Pool Resources

William M. Adams,[1]* Dan Brockington,[2] Jane Dyson,[1] Bhaskar Vira[1]

Conflicts over the management of common pool resources are not simply material. They also depend on the perceptions of the protagonists. Policy to improve management often assumes that problems are self-evident, but in fact careful and transparent consideration of the ways different stakeholders understand management problems is essential to effective dialogue.

The management of common pool resources can be viewed as a problem of collective action and analyzed in terms of the costs and benefits of cooperation, institutional development, and monitoring, according to variables such as group size, composition, relationship with external powers, and resource characteristics (1–5). However, resulting policy debates are often flawed because of the assumption that the actors involved share an understanding of the problem that is being discussed. They tend to ignore the fact that the assumptions, knowledge, and understandings that underlie the definition of resource problems are frequently uncertain and contested.

Recent policy debates over natural resource management have revealed the unexpected consequences of the assumption that problems (and therefore solutions) are self-evident. For example, in the 1970s and 1980s, governments and donors in Asia and sub-Saharan Africa perceived an impending fuel wood crisis. In response, they developed social forestry projects to persuade smallholders to plant trees on their farmlands, assuming that the aggregate assessment of shortages reflected an acute need for fuel wood at the household level. Subsequent research showed that the assumptions behind these interventions were deeply flawed (6, 7). Some households indeed planted trees to provide fuel. Many others responded to scarcity by sharing cooking arrangements, increasing labor devoted to collection, substituting between fuels, migrating, or engaging in nomadism and transhumance. Furthermore, those farmers who planted trees primarily did so as a cash crop to be sold for pulp, small timber, and poles, not as a subsistence commodity for fuel wood. The problem of fuel wood scarcity, as perceived by government planners and donors, was quite different from the problems of primary concern to small farmers, who were trying to secure access to sustainable livelihood options by optimizing the use of their land and labor resources.

Similarly, concern over appropriate rangeland use in Africa has long been dominated by the perception that pastures were being overstocked (8). A variety of self-evident notions supported this, including the idea that cattle were kept purely for prestige and that use of commonly held pastures could not be regulated. Subsequent research into dry-land ecology, herd use, and pasture management suggest that high stocking rates can make sense where ecosystem productivity is driven by variable rainfall (9–11). Too many livestock will still cause problems for some herders, but there are no grounds for the unmitigated gloom surrounding policy debates about the overstocking of these rangelands.

Defining Resource Management Problems

Problem definition is critical to the process of making policy, yet its role is rarely scrutinized. Stakeholders often do not explicitly recognize the ways in which their knowledge and understanding frame their perspectives on common pool resource management policy. Although conflict is a feature of many resource management regimes, it is often assumed to reflect differences in material interests between stakeholders. In such circumstances, conflict may be managed by trading off different management objectives (12) or by attempting to reconcile multiple interests in resource management (13).

We suggest that the origins of conflict go beyond material incompatibilities. They arise at a deeper cognitive level. In our view, stakeholders draw on their current knowledge and understanding to cognitively frame a specific common pool resource management problem. Thus, differences in knowledge, understanding, preconceptions, and priorities are often obscured in conventional policy dialogue and may provide a deeper explanation of conflict. It is precisely when different stakeholders (of different sizes and operating at different levels) reveal different interpretations of key issues that the policy debate can be most productive. The knowledge which allows stakeholders to define the problems of resource use falls into three realms: knowledge of the empirical context; knowledge of laws and institutions; and beliefs, myths, and ideas.

Stakeholders' knowledge of the empirical context derives from a variety of sources. At the local level, knowledge may derive from direct personal experience, particularly of extreme events such as droughts or floods. At larger scales, knowledge may reflect inference from known changes elsewhere, such as the insights of formal empirical and theoretical research by official agencies and research organizations using remote sensing, censuses, or sample surveys. Decision-makers and stakeholders are likely to differ in their access to, and understanding of, these diverse sources of knowledge. Thus, the knowledge of any particular stakeholder will be partial and hence may be contested by other actors.

The ideas, ideologies, and beliefs brought to bear on problem definition by different stakeholders can substantially influence problem perception. Religious beliefs and moral conviction can be important in structuring understanding, both among local people and scientists. Ideas derive legitimacy from received wisdom about theory [e.g., the widespread belief in the "Tragedy of the Commons" (14)] and from ideas outside formal science, including informal or "folk" knowledge. Policy narratives or story lines can exert a powerful influence on official decision-makers' perceptions of resource management problems (15–17). Divergent received wisdoms used by different actors in their analysis are a potent source of conflict over appropriate response options.

Most common pool resource management situations do not operate in isolation

[1]Department of Geography, University of Cambridge, Cambridge CB2 3EN, UK. [2]School of Geography and the Environment, University of Oxford, Oxford OX1 3TB, UK.

*To whom correspondence should be addressed. E-mail: wa12@cam.ac.uk

from a wider context of the legal and institutional framework. Stakeholders differ in their knowledge of this framework: A local herder may be unaware of a country's policy commitments under the Convention on Biological Diversity, whereas a state resource manager may be forced to act in particular ways because of commitments under such multilateral agreements. In this sense, knowledge about laws and institutions may be seen as providing both constraints and opportunities for common pool resource management, because this knowledge forces stakeholders to consider resource uses that are compatible with these wider policy processes. Importantly, knowledge about policy is likely to contribute to the way in which a stakeholder perceives a problem and hence the alternative responses that he or she is willing to consider.

Cognitive Conflict in Common Pool Resource Management

If each stakeholder is only able to define problems and test the set of possible response options in the context of his or her particular knowledge and understanding, then agreement is less likely, both in terms of perceptions and problem definition as well as over the desired response to the problem. Thus, policy conflict arises because differences in knowledge and understanding between stakeholders frame their perceptions of resource use problems as well as possible solutions to these problems (Fig. 1).

One cannot, therefore, simply analyze the economic interests of different claimants to rights over a defined resource. Different people will see different resources in a landscape. They will perceive different procedures appropriate for reconciling conflict. Moreover, perceptions will change, because different elements within the landscape will become "resources." For example, a market may develop for something previously regarded locally as useless or destructive of value, such as wildlife tourism. In these situations, the realm of conflict between beneficiaries and others will be both cognitive and material.

Where cognitive conflict is important, policy dialogue needs to be structured so that differences in knowledge, understanding, ideas, and beliefs in the public

arena are recognized. Ostrom's seminal studies of the evolution of institutions of water management in California demonstrate the value of precisely this dialogue, and the absence of dialogue explains the failure of these institutions to emerge (*18*). Similarly, Wilson has argued that only by making explicit the uncertainties and ignorance inherent in understanding of fisheries will it be possible to establish the collective learning experience necessary to manage resource use in such complex ecosystems (*14*).

Making explicit the basis of different stakeholders' positions is likely to improve the transparency and effectiveness of negotiations between stakeholders by enabling
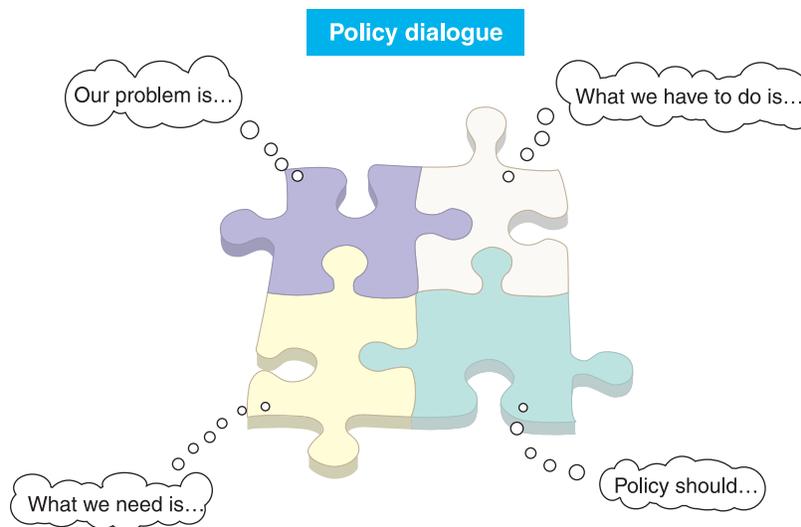

Fig. 1. Cognitive conflict over common pool resources.

actors to understand the plurality of views that prevail in the context of resource use and management. Failure to recognize the cognitive dimension of conflict results in superficial policy measures that fail to address the deeper underlying (structural) differences between resource users.

Of course, a deeper understanding of stakeholder differences over common pool resources does not guarantee that policy negotiations will result in win-win scenarios, but it may smooth the path toward consensus in situations where there are incompatibilities in stakeholders' interests, values, or priorities. Management effectiveness will always be limited by incomplete knowledge and understanding of complex natural and social systems. Our type of reasoning will not help if decisions are driven by the unilateral political will or the economic power of particular stakeholders. If policy is made in a way that precludes dialogue, our approach will be of limited use, except to explain why things go wrong. This perspective on resource conflict can

reveal the incompatibility of competing perceptions, but it cannot by itself reconcile them. Techniques for conflict resolution, negotiation, and management must then come into play. To some extent, policy will always involve "tragic" choices that contradict the deeply held values and beliefs of some stakeholders (*19*).

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