

Understanding Patterns of Human Interactions and Decision Making: An Initial Map of Podocarpus National Park, Ecuador

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Successful conservation is as much about people and how they make decisions as it is about flora and fauna. Just as it is possible for a practitioner to systematically understand the biophysical patterns and processes of a natural resource issue, there are methods to systematically understand patterns of human interactions and the processes of decision making that affects these issues. Understanding these patterns and processes can unearth more effective interventions to improve management and policy. We use case material from a rapid assessment of Podocarpus National Park (PNP), Ecuador (March 10–19, 2005) to introduce a proven framework that is systematic yet flexible, designed to understand patterns of human interactions (arenas) and decision making. While outlining this framework, we begin to create a narrative map of how people interact and how the decision-making process occurs around PNP. We suggest that participants involved in the conservation of PNP use such a framework to better understand the situation in which they find themselves. In reference to our initial assessment of PNP, we suggest the concept of prototyping,

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particularly through community-based initiatives, as a tool to help improve arenas and decision making.

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INTRODUCTION

Maintaining resources for future generations is one of the many goals of conservation. When this objective is not met, typically the first people blamed are those who exploit natural resources. In Podocarpus National Park (PNP), Ecuador, unsuccessful conservation has been attributed to cattle ranchers, poachers, illicit orchid harvesters, gold miners, and timber harvesters (Tello, Fiallo, & Naughton-Treves, 1998; Clark et al., this volume). While the activities of these individuals are of concern for conservationists, identifying these resource users and their activities as barriers to success only scratches the surface of the true nature of the problem. A more in-depth diagnosis would reveal a breakdown in decision-making processes and an inability to create situations where common-ground outcomes are possible. This lack of attention to the underlying causes of social, political, biological, and economic problems is all too frequent in natural resource management throughout the world, and is often the true obstacle in moving toward successful conservation (Clark, 2002).

In short, successful conservation requires securing a process by which people can make effective decisions. Doing so necessitates a structure of at least minimum organization. In this article, we (a) introduce a framework to understand patterns of human interactions (arenas) and the decision-making process, (b) describe how to utilize the framework with case material from PNP and Ecuador, and (c) recommend ways to improve decision making. Such a framework could be employed by participants involved in the conservation of PNP to better understand the situation they find themselves in, and to identify more effective points of intervention. This approach has been utilized in a number of cases including both development projects in Peru (Dobyns, Doughty, & Lasswell, 1971) and Afghanistan (Brunner, 2004), and conservation projects in Australia (Clark, Mazur, Cork, Dovers, & Harding, 2000) and Brazil (Fenimore & Cullen, 2002).

METHODS

This article is the result of a 10-day rapid assessment (March 10–19, 2005) of PNP in southern Ecuador. This assessment was part of a semester-long rapid appraisal course at Yale University's School of Forestry and Environmental

Studies. Although criticized for inadequate understandings of social dynamics and local communities, rapid assessments have proven to be useful tools in conservation (Clark & Ashton, 2004). They enable a large amount of information to be quickly gathered and analyzed, and allow the analyst to suggest alternative courses of action or research. To maximize our understanding, in the 2 months prior to our visit, we conducted a literature review on ecological, political, and social aspects of Ecuador and PNP, and interviewed individuals with first-hand knowledge of Ecuador and PNP. Upon arriving in Ecuador, we traveled between two different provinces (Loja and Zamora), and visited the capital of Ecuador (Quito). We interviewed more than 30 individuals, representing four non-governmental organizations (NGOs), three government agencies, three universities, three foundations, two local communities, and a private business. In addition to our semi-formal interviews, we attended many presentations, visited libraries, and had informal conversations with individuals we met along the way. In analyzing this information, we draw heavily upon the social science literature of the policy sciences. This well-developed body of literature allows the analyst to take a problem-oriented, contextual, and multi-method understanding of the problem at hand (Lasswell, 1971; Lasswell & McDougal, 1992; Clark, 2002).

MANAGEMENT AND ARENAS

People interact around PNP on a daily basis in many different ways. Elected officials at the national level of Ecuador may interact with each other to create legislation to safeguard the interests of the entire country, such as the protection of Ecuador's natural resources. Bureaucrats from the Ministry of the Environment may interact with the director of PNP to help determine funding requirements for the park. Local NGOs may interact with community leaders to develop projects that can help protect the park and serve local needs. All interactions and decisions, such as these, take place in what is called an arena.

An arena is created anytime two or more people recognize that the outcomes of their decisions impact each other (Lasswell & McDougal, 1992). Arenas can be understood as centralized or decentralized, continuous or short-lived, focusing on specialized topics or general interests, organized or unorganized, and open or closed to broad participation. From a policy perspective, the ideal is to remain sufficiently flexible to balance these factors in a manner that allows the broadest community goals to be realized (McDougal, Lasswell, & Reisman, 1981). A community is simply a group of people whose interactions impact each other, whether or not they are aware of their impacts. It does not appear that the pattern of human interaction around PNP is balanced to allow the broadest community goals to be

realized. We suggest that understanding the factors that distinguish and characterize arenas could help participants in the region stabilize the current arenas, developing the conditions necessary for better decision making.

Centralized and Decentralized

The merits of top-down versus bottom-up decision making are often debated in the policy literature (Brunner, Colburn, Cromley, Klein, & Olson, 2002, chap. 1; Honig, 2004; Weible, Sabatier, & Lubell, 2004). Rather than advocate for one approach, we assert that these approaches are complementary. To demonstrate this concept we use two examples. Imagine if every individual in Ecuador were to debate and subsequently vote on any given policy alternative in the national political arena—in other words, 12 million people sitting in a room to have a dialog and solve problems on an issue such as national defense. For practical purposes, due to the time needed to reconcile 12 million different opinions, decision making would effectively halt. To resolve this dilemma, the country of Ecuador has installed a representative democracy where people vote for representatives to secure their interests. This is not to imply that all centralization is desirable. Imagine national politicians gathering to individually consider what proportion of agricultural products a subsistence farmer should cultivate. Spending national resources on such a problem is not in the nation's interest, and is an impediment to the farmer's individual freedom. Since neither extreme is desirable—fully centralized or decentralized—this suggests that there must be a balance of centralized and decentralized arenas. However, what should this balance be? The answer is never clear, depends upon the given context, and will continually change throughout time (McDougal et al., 1981).

In PNP, an effective balance between centralized and decentralized arenas is not occurring. To illustrate this problem, we look at the relationship between Ecuador's Ministry of the Environment and Ministry of Energy and Mining. In 1990, 8 years after the formation of PNP, Tello, Fiallo, and Naughton-Treves (1998, p. 303) interviewed a high-ranking official from the Ministry of Energy and Mining regarding mining concessions in PNP. When asked about PNP, the energy and mining official responded with "What park?" and claimed there was no record of a protected area in the concessionary maps." The absence of the park from the Ministry's map may be conventionally understood as poor communication between the agencies. However, it can also be understood in terms of the lack of effective centralization. Centralization in a bureaucracy allows for information to flow up the chain of command, and flow back down other channels. In this context, centralization can be thought of as effective coordination. While this example is from over 10 years ago, our interviews suggest that this type of poor interagency coordination is still the case. Similar to Tello et al.'s (1998)

findings, an interview with a park official revealed that the Instituto Nacional de Desarrollo Agrario (INDA, the government office responsible for granting land tenure) is continuing to grant land rights to people inside PNP. This is in part due to INDA using outdated maps, although park officials have granted concessions to community leaders to help reduce long-standing conflicts.

Continuous and Short-Lived

When understanding an arena, its duration plays a critical role. Some problems require a long focus of attention, such as global climate change, potentially stretching hundreds of years. Other problems focus on short-term issues, where the duration of the arena could be fairly short, such as clearing a landslide from a particular stretch of road. The degree to which an arena is continuous or short-lived should be determined by the issue to be resolved. Arenas designed around specific issues should match the scale of the issue. However, broader arenas where community goals are trying to be realized should be maintained as on-going.

It is generally recognized by the people we interviewed that Ecuador's national government is extremely unstable. Since the country's independence in 1830, there have been 18 different constitutions, the most recent in 1998. This trend is mirrored by the succession of seven different presidents in the last 10 years. In fact, within 1 month of the completion of this rapid assessment, the president was removed from power for corruption. This constant transfer of executive power makes achieving conservation-related or other long-term goals on the national scale extremely difficult. A former official at the Ministry of the Environment told us, "in 18 months, I worked under three different presidential administrations and seven different Ministry directors . . . getting anything done at the national level is impossible." She stated that in order to achieve any meaningful change, lower level agency officials, where the agencies are more stable, need to informally work together. She is recognizing that at the centralized national level there are a series of short-lived arenas, and because of this, people do not rely on the central government as they expect a stable long-term arena to address ongoing concerns. In contrast, the local arenas in Ecuador tend to be more continuous, making the arenas more reliable forums of participant interaction.

Organized and Unorganized

The effectiveness of an arena is also reliant on the degree to which it is organized. Organized arenas allow decisions to happen with more speed and economic efficiency, particularly when a technical decision must be made. In contrast, unorganized arenas allow more organic and creative policy alternatives to form. Just as with the dynamics of (de)centralized arenas,

the goal is to find the optimum balance between organized and unorganized arenas (McDougal et al., 1981). Education presents a good example. A primary educational institution desires enough organization (standardization) over the curriculum of each educator so that the administrators can ensure a constant quality of education. However, it is desirable for the institution that the educator be unorganized (sufficiently flexible) enough in the interaction with each student to adapt to the best learning styles of the particular student.

The dissemination of agro-forestry practices around PNP provides examples of how an unorganized and organized arena can balance each other to help achieve similar goals. Improving food security and economic opportunity were two common objectives in the communities we visited. One of the many methods Ecuador has used to help facilitate these community objectives was creating the now defunct Proyecto de Desarrollo Forestal Campesino en los Andes del Ecuador (DFC). This program (organized area) distributed and encouraged the use of two Central American species (*Glivicia sepium* and *Erythrina* sp.) for use as living fences in home gardens. The idea was to help local farmers find more sustainable and cost-effective measures to operate their farm. In contrast, many agricultural practices are spread in a much more informal manner (un-organized arena) such as word of mouth or observation. Farmers may discuss with their neighbors the latest innovations, techniques, species, or seeds in local agricultural practice. They try out these techniques, and adopt the best for use in their practice.

Specialized and General

Many decisions in conservation are best left to the experts. For example, when a conservation goal is widely agreed upon by the general community, a biological expert may be asked to tell us the likelihood of achieving that goal through a particular action. This type of interaction occurs in a specialized arena. In contrast, a non-specialized arena is one in which broad participation occurs. For example, when deciding what the goals of conservation should be, ideally the whole community is involved. This allows for more participation, and ideally an outcome in the interest of the community. The balancing of these two types of arenas, in general, calls for non-specialized arenas in determining the goals and general courses of action, and specialized arenas for carrying out specific tasks designated by individuals in the non-specialized arenas (McDougal et al., 1981).

In conservation, decisions are frequently made by experts in specialized arenas, often to the detriment of local communities (Chapin, 2004). In PNP, the creation of management plans, and even the original designation of the park, have been activities carried out by experts. An example is the recent development of a new plan for PNP by Programa Podocarpus and

the Ministry of the Environment. Programa Podocarpus was a US\$5 million program funded by the Dutch government to help improve management and conservation of the park, which now operates on a much smaller budget (see Johnson this volume). The general perception in the local NGO community is that Programa Podocarpus hired a number of consultants to draft a management plan with the Ministry of the Environment. While social information was integrated, the people around PNP had no real voice in the creation of the plan. This may be one of the reasons that, according to the director of the park, “enforcement [of park regulations] is a major problem.” If the management plan was created in a broader arena, the larger community could agree to a common set of rules. Rules that are widely agreed to be legitimate are easier to enforce than those that are perceived as illegitimate.

Access

Access is the degree to which any particular participant can be involved in the arena. Access to arenas can be free and open, for example through participation by individuals in local community groups. Arenas can be highly restricted, such as who has access to national security information. They can be limited by physical attributes, such as who has the ability to travel and attend. We follow McDougal *et al.*'s (1981) two-part recommendation that access to any arena be (a) open and available to those individuals who wish to have a role in decision making and have a legitimate interest in the outcome, and (b) be sufficiently compulsory to ensure participation by those individuals deemed critically effected by the outcome. This is not to say that every decision should be open to every participant, nor that perfect participation is necessary. As previously described, in some arenas it is desirable to limit participation, such as in a specialized arena. However, when the decision affects the broader community, significant effort should be taken to maintain, at a minimum, participation by those directly affected by the outcome.

Access to arenas in PNP is limited in a number of regards. One barrier to access is formal restriction of conservation arenas, by government agencies and NGOs, through specialized arenas. The previous example of Programa Podocarpus highlights this problem. A second type of restriction of access is due to the infrastructure around the park. While roads are typically considered to hinder conservation-related activities (Bernardi, this volume), they do facilitate the physical movement of individuals to areas where people can work together. In other words, to have a public meeting (an arena with open access), it is likely that individuals must travel along a road to attend the meeting. In our travels around PNP, there were multiple instances where we could not travel on major roads, due to landslides washing out the road. This type of barrier to movement is a regular occurrence around the park. In fact, the only road between the two cities from

which the Ministry of the Environment manages the park (Loja and Zamora) is sometimes closed for four days at a time due to landslides. Other restrictions include the social boundaries created by an individual's perspective on whose participation is legitimate (see Clark et al., "Social Process," this volume). Restrictions such as these make it difficult to have reliable, continuous arenas, where broad participation on conservation-related issues can occur.

MANAGEMENT AND DECISION MAKING

Any interaction among participants within an arena is part of a decision-making process. A decision process is the reconciliation of perspectives, ideally in the common interest of the participants involved. That is to say, given the resource base of each individual and the structure of the arena that they are operating in, it is the process by which groups or individuals negotiate their desired expectations and outcomes. This can take the form of win-lose relationships, where someone gets what he or she wants and someone else does not. However, an effective decision-making process will help individuals identify a mutually agreeable outcome.

There are two types of decision processes occurring in PNP: ordinary and constitutive. An ordinary process is one in which decisions are made regarding everyday problems. Examples of ordinary decision making include decisions on how to manage timber extraction, how much land to set aside for conservation, and where to conduct biological research. Contrary to most people's beliefs, there is rarely a single decision maker or a decision made in a single place and time. These types of decisions happen through a continuous process, where many small decisions, by a diverse group of people, create what appears to be a single decision.

There are numerous examples of this type of process around the park. One example of an ordinary process in PNP is Cuoco and Cronan's (this volume) exploration of the use of orchids as a non-timber forest product as a substitute for current methods of extraction. In contrast, a constitutive process sets the norms that govern ordinary processes. Understanding a constitutive process is often much harder to grasp, as it has to do with the unwritten expectations of the broader society. So, rather than addressing how to manage orchids as a non-timber forest products, a constitutive process addresses the broader expectations of society on how we should be making decisions about natural resources in general. The Ecuadorian constitution is an example of a formal constitutive process. This document symbolizes the expectation of the Ecuadorian people on how decisions should be made in the country. Both types of process, ordinary and constitutive, are occurring in PNP, and achieving successful conservation means securing both effective constitutive and ordinary processes.

Any effective decision process, ordinary or constitutive, explicitly or implicitly attends to six functions and ideally meets a number of standards (Lasswell, 1971; Brewer & deLeon, 1983; Lasswell & McDougal, 1992; Clark, 2002). The first function is *surveillance and planning*. Any good decision is based on factual knowledge, from a variety of sources, which takes a comprehensive look at the current situation and target the most relevant components of the problem at hand. Second, a *promotion* function, where different courses of action are evaluated and debated from many perspectives, to select the most effective alternative in the participants' interests. Third is a *prescriptive* function, where rational and effective rules, based on the selected course of action, are determined by an inclusive group of individuals affected by the outcome. In the fourth function, *implementation*, the rules are put into practice in a timely and non-provocative manner, allowing enough flexibility to be modified to improve their effectiveness and rationality. Fifth, the *appraisal* function is where a wide range of information is collected and analyzed, to develop an unbiased assessment of how the goals of the program are being met. In the sixth function, *succession*, practices that are not working or have not achieved their goals are cancelled or reformed.

Anyone in the real world can tell you that decisions often do not occur in the linear fashion that this framework seems to suggest, nor are arenas neatly categorized in the groupings from the previous section. We don't pretend that this is the case. Some of the functions may be over- or under-attended, they may occur in a different order, at the same time, nor in any comprehensible fashion. However, breaking down what is happening in these functions allows for a more systematic and comprehensive understanding of what is occurring. This allows a greater and more creative set of policy alternatives to be explored. To help demonstrate their usefulness we explore some of the case material around PNP.

Surveillance and Planning

This function, known as intelligence, is the process of collecting, analyzing, and disseminating information to those involved in decision making. To do this, the group or individual engaging in the activity need to identify what goals they are trying to achieve, collect data on what has been occurring, determine why that may be the case, make projections into the future, and suggest alternatives to solve the problem. When attending to this task, it is imperative that information gathered be of high quality (factual), and from a wide variety of sources. Ideally, access to intelligence should be widely available, so that the entire community can legitimize information. This process is further detailed by Clark (this volume), in his article on the intelligence function.

A major example of surveillance and planning is the partnership between PNP and the Dutch Programa Podocarpus. One of the many activities of this

partnership was to help produce basic information on the biological status of the park and develop a management plan for the park (see Becking, 2004). Similar planning exercises have been led by NGOs such as The Nature Conservancy, Conservation International, and ArcoIris. The approach taken by these different organizations is similar. A substantial amount of biological information is compiled, by local and international experts, and then modeled in Geographic Information Systems to create maps of where conservation activities should take place.

Promotion

Based on the possible alternatives formulated in intelligence, this function is the open debate on what to do. In this phase, participants use their available resources to sway the opinion of others. For example, in an open and democratic society this could partially take place in the news media or through advocacy work. In an authoritative society, a dictator could mobilize his resources (the military, the press, etc.) to force support for his alternative. Ideally, promotion will formulate effective policy options, through rational evidence, that takes into account the multiple effects (biological, social, political, economic, etc.) that a policy will have once it is implemented.

Most environmental NGOs involved in the conservation of PNP spend considerable resources promoting their preferred alternative. In the communities on the western border of the park, ArcoIris has focused heavily on water issues. The organization's general argument is that water on the western border of PNP is a scarce commodity and that the park is "the protector and source of all water in the region" (Stern, 2002, p. 42). Interviews with ArcoIris revealed that the organization approached the local people with an educational strategy and the provincial government with a political strategy to rally support for its desired alternative of improved protection of the park. This campaign has been a relatively successful in initiating the implementation of a pay for environmental services program called ECOFONDO (see Redondo-Brenes, this volume).

Prescription

The prescription function crystallizes the community's expectations, based on the promoted alternative, into a set of conventions to be followed. In short, this phase can be thought of as setting the rules. The rules can take the form of laws and regulations, the development of a new program, or changing social norms of how the broader community should act. These rules are then enforced, to help achieve the goals articulated by the prescription. Good prescriptions should be effective in achieving the desired

outcome. To do this, they must be fair, balanced, and be widely accepted by the broader community as legitimate.

In general, prescriptions around PNP are weak. In our interviews, numerous individuals stated that people routinely break the park's rules by harvesting vegetation, poaching wildlife, or extracting mineral resources. To solve this problem, there is a general call for better enforcement by the park. However, we are suggesting that this is a problem of prescription and not implementation of the rules. In his surveys of the local communities around PNP, Stern (2002) identified that most people are dissatisfied with the park rules, and that they believe the regulations to be easily broken. Our interviews confirm this, as we found that when someone is caught breaking the law, there is the general belief that the perpetrators go unpunished. This suggests that the rules are not widely accepted by the communities around the park as legitimate, nor are they accepted by the agencies charged with enforcing them. Improving the prescriptive function will make enforcement easier, as the community at large will believe the law to be in their interest.

Implementation

If the rules are not effectively put into action, once they are formed, what results is little more than a planning exercise. Implementation is the function by which the community puts the new prescription into effect, making sure it is in concert with pre-existing rules, and resolving disputes that arise once the new prescription starts affecting people. Prescriptions should be implemented in a timely and rational manner, and should not antagonize the participants that they affect.

In general, implementation of conservation-related programs have been weak around PNP. This is often due to inadequate prescriptions, which create a situation where implementation is impossible. Most people around the park attribute poor implementation to the lack of available resources. The director of PNP stated that his yearly operating budget was approximately US\$45,000, while US\$300,000 is necessary to adequately manage the park. He stated that implementation of the park's management plan is nearly impossible without a full budget (L. Medina, personal communication, March 13, 2005). Local NGOs complained of similar budget shortcomings, and claimed that the failure of their programs were due to lack of funding.

There have been successful programs around the park, however, that do not rely on significant funding. Rather, these programs align the expectations and desired outcomes of the participants to find some sort of common ground. One such program is AcroIris' beekeeping project. This program, whose goals are to improve community development and help maintain natural vegetative cover, uses beekeeping as a non-timber forest product. The project has successfully trained 35 beekeepers, and provided basic

beekeeping equipment, such as veils, smokers, and honey extractors. As the program gained success, it led to the development of a beekeepers' association where the 35 beekeepers pooled their resources to buy communal equipment and sell their honey under one label. The successful implementation of this program is partially due to finding a common ground outcome between the local participants (increased revenue) and conservationists (less land conversion). In contrast, implementation of other programs, such as the management plan for the park, often antagonizes participants. This makes it difficult for prescriptions to be implemented, leading participants, such as the Ministry of the Environment, to believe that more resources need to be spent to achieve their desired outcome. However, successful implementation may be more likely to occur if the prescriptions are modified to encompass the perspectives of those affected by the program.

Appraisal

Once a plan has been implemented we must ask ourselves a simple question; how are we doing? This process of assessing value of the implemented prescription is called appraisal. Appraisal should be practical. Cost-effective data should be collected in a continual timeframe, and analyzed in an unbiased fashion. The idea is not to find data to promote the success of a given policy. Rather, it is to understand what does and does not work, why that is the case, and how the current prescription can be altered to do better.

There has been little systematic appraisal in PNP. Interviews revealed that most people involved in the conservation of PNP do not see the need for reflective self-appraisal. When asked about what measures of success a particular NGO uses, one of the NGO's employees stated that, "if we are still around 2 years from now . . . and receiving funding, we know we are successful." In such a resource-deprived area, it is not surprising that this attitude toward success was expressed. Further questioning revealed that one of the reasons for the lack of self-appraisal by this organization was a fear of looking unsuccessful in the eyes of foundations providing them with support. In other words, lack of appraisal is being used as a defensive mechanism to maintain the organization's viability. However, this dynamic has negative impacts on one of the goals of this organization, namely to improve regional conservation. By engaging in comprehensive appraisal, conservation efforts around the park would likely improve through learning from mistakes and developing new strategies on how to do better in the future.

Succession

Once we have gathered enough information to evaluate the current course of action, we need to decide if it is time to succeed the current policy.

Succession (termination) is modifying or ending prescriptions that do not achieve the desired result. This should not connote failure. It should be viewed as the result of learning. Appraisal will highlight that some previous policies are less than ideal. If the current prescriptions have not been designed to phase out in such a situation, the result will be policies that hinder the community's goals from being achieved. Ending old programs allows things to get better. When a decision occurs to terminate a particular prescription, it should happen in a timely fashion, be factual, and be supportive of the individuals the succession harms.

Succession takes many forms in Ecuador and PNP. For example, the rapid series of presidents can be viewed as over-attention to the succession function. Built into Ecuador's constitution is a termination clause stating that the president can only serve a 4-year term. However, as one interviewee explained, "Every 2 years or so we decide that we don't like our president, we remove him, and elect someone new. This is the way it has always been." This over-attention to succession destabilizes the national arena, by challenging the formal constitutive process in the constitution with the informal constitutive process that operates in practice. However, around PNP succession is *under*-attended. Even with inadequate appraisal, we know that some policy alternatives are not working. For example, the current strategy to raise money for the park through ecotourism has been largely unsuccessful. PNP receives 1,914 international visitors out of the more than 900,000 international tourists to Ecuador each year (BID-MAE-MINTUR, 2005). Raising these visitation statistics for PNP has been a goal of the Ministry of Tourism, but it continues to pursue the same strategies that haven't worked (see Moran-Cahusac, this volume). Succession of current practices in favor of new strategies may help the Ministry realize its goals.

RECOMMENDATIONS

This list of ecological and social problems in the areas surrounding PNP is long, varied, and complex. Rapid deforestation, poor water quality, rural poverty, and transportation difficulties are just some of the issues that participants are working to overcome. However, before individual problems can be fully addressed, participants must take a step back and attend to the organization of the social and decision processes that affect the issues at hand. We suggest participants (as described by Clark et al., this volume) use the framework presented here to better organize the conservation arena and decision process. A series of questions have been developed to assist participants in the use of this framework, and determine how best to improve the situation in which they find themselves. Based upon our initial map of PNP, we recommend prototyping as a possible method of intervention. Prototyping

is a continual process that helps participants learn from past experiences to improve decision making in the best way they see fit.

Structure Arenas in Better Ways

The situations described in this article illustrate some of the major shortcomings of how arenas are arranged in PNP. In short, there is a lack of adequate arenas for the broader community to interact and make decisions about conservation and other issues that impact their lives. This lack takes the form of an unstable national government, where poor centralization does not allow individuals and organizations at a more local level to communicate and coordinate effectively. At the local level, the Ministry of the Environment and environmental NGOs have developed specialized arenas, where access is limited to those with expert knowledge. However, the problems identified that are a threat to conservation and the park are not expert driven. The problems—including mining, logging, roads, poaching, and illicit plant collection—are all problems of the conflicting expectations of how the resource should be used. Solving such issues would be better served in a general arena, where the opposing groups and individuals could interact in a more constructive manner.

Developing an awareness of how arenas operate can help practitioners identify ways to facilitate effective problem solving. This paper has identified five categories of characteristics of arenas that must be evaluated: power structure, timeframe, level of organization, type of problem, and participation. The set of questions devised are to provide practitioners in PNP and elsewhere with a better understanding of the arenas where they work (Table 1). This will allow a more contextual understanding of the

TABLE 1 Questions to Ask When Investigating an Arena

Structure of arenas	Questions to ask
Centralized or Decentralized	Which groups (organizations and individuals) have control over decision making? Are these groups local, regional, national, or international?
Continuous or Short-Lived	What is the time frame of the issue at hand? Does the pattern of human interaction match the time scale of the issue? How is the arena terminated?
Organized or Unorganized	Is it an organic process or is it highly structured? What are the rules (formal or informal) on how a decision should be made?
Specialized or General	Does the problem affect social values, issues of social equity/justice—broad in scope? Is the problem a technical decision/narrow in scope?
Access	Who has the ability to participate? In what capacity? With what restrictions? What can they affect change of?

problem to be mapped, and allow practitioners to have a fixed reference point in gauging how the arena has shifted over time.

Better Structure for the Decision Process

Conservation decision making in PNP appears to heavily focus on surveillance, planning, and promotion. Considerable effort is made to collect, process, and disseminate biological information about the park. In addition, detailed planning exercises have taken place to recommend ways to improve the management of the park and its surrounding areas. While these are all necessary steps, crystallizing these ideas in the eyes of the larger community have fallen short. Not paying attention to the social aspect of conservation in these functions has led to inadequate prescriptions, and the inability to effectively implement conservation programs. Encouraging self-appraisal by the participants involved in the conservation of PNP could lead to the succession of old conservation practices towards more effective approaches developed by those involved.

The structure of the decision process is a direct result of the arrangement of the arena. Arenas that are balanced and well-functioning will contribute to better decision-making arrangements. This article outlined six decision functions: surveillance and planning, promotion, prescription, implementation, appraisal, and succession. Standards for each of the seven functions describe how the decision process should operate and are included in Table 2. The set of questions in Table 2 are designed to evaluate whether these standards are being met.

Prototyping

PNP is home to many conservation and development projects, with mixed records of success and failure. Although the lessons from these projects are not systematically harvested, they provide valuable learning experiences to participants and others interested in conservation. The ability to draw upon past successful experiences, and understand why they worked, can help participants develop better practices to apply in the future. Similarly, lessons can be learned from project failures. The framework outlined in this chapter provides a comprehensive way to evaluate past experiences, harvest lessons, and inform future actions—in other words, to engage in prototyping.

Prototyping is a “small-scale trial intervention in a policy or social system with the express intent of learning about the system and improving outcomes” (Clark, 2002, p. 143). Lessons harvested from prototyping have the advantage of being field-tested and based on practical, similar experiences, which makes them highly applicable and useful for the current arena (Brunner et al., 2002; Clark; Clark & Padwe, 2004). Through a rational, integrated approach to information gathering and dissemination, prototyping can help

TABLE 2 Questions to Ask When Investigating a Decision Process (Adapted from Clark, 2002, Table 4.1)

Decision process functions	Standards	Questions to ask
Surveillance and Planning (intelligence)	Factual Comprehensive Selective Creative Open	Is data (intelligence) being collected for all components of the problem? Does this data cover all affected participants and the problem's context?
Promotion	Rational Integrative Comprehensive Effective	Which groups support which courses of action (informal and formal)? Which groups benefit from the different courses of action?
Prescription	Balanced Effective Inclusive Future-directed	Does the new course of action harmonize with existing rules and institutions? What rules are self-imposed (by the community)? Which courses of action are binding?
Implementation (invocation and application)	Timely Rational Dependable Effective Nonprovocative Unbiased Constructive	Is implementation consistent with the new course of action (prescription)? Who do the rules apply to? Who enforces the rules? What sanctions will be enforced and when? Are there resources to carry out implementation?
Appraisal	Dependable Ongoing Unbiased Practical	Who does the program serve and who does it not? When is the program evaluated? Who is accountable for successes and failures?
Succession (termination)	Timely Comprehensive Dependable Supportive	Who terminates or changes the program? Who does change serve or harm?

develop “successful models of governance” that are adaptable to different contexts (Brunner et al., p. 208). Prototyping requires that practitioners collect information in a way that is useful and relevant to others. The questions in the above recommendations provide a model for the type of information that can guide community-based initiatives or other conservation efforts. Systematic information gathering provides consistency and ensures that all components of the policy process have been analyzed.

CONCLUSION

Often conservation practitioners become locked in by their disciplinary boundaries and have trouble finding creative and novel solutions to the challenges they face. The framework presented in this work is one method that a practitioner may use to break free of the box he or she is working in,

to find new ways to look at and solve old problems. We introduced the idea of arenas (patterns of human interactions) to describe the geographic, temporal, and institutional components of where decisions are made. Understanding and learning how to shift arenas can greatly improve the efficacy of problem solving. We then introduced the idea of the decision-making process to describe the set of functions through which most problems are solved. Improving decision making will lead to longer-term solutions in the interests of the participants involved. There is no single right way to improve arenas or decision making. However, by using the questions and the ideas presented in this article, participants around PNP will be able to help themselves find better ways to improve the process of conservation.

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