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Donor-Initiated Common Pool Resource Institutions: The Case of the Yanesha Forestry Cooperative

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Summary. — Several authors have drawn on case studies of successful common pool resource (CPR) institutions to develop principles for predicting when a CPR regime will form and the likelihood of its success once created (Ostrom, 1990). This paper examines the development and dissolution of the Yanesha Forestry Cooperative in the Palcazu Valley of Peru to test the relevance of Ostrom's CPR design principles to indigenous forest management regimes involving donor assistance and other external influences. The paper expands several principles and suggests ways in which external agencies can assist more effectively in the development of durable common pool resource institutions. Copyright © 1996 Elsevier Science Ltd

1. INTRODUCTION

From forests to fisheries, irrigation systems to oceans, public spaces to the atmosphere the management of open-access and communal resources is crucial to our future as a species. The issue of the exploitation of communal resources has received much attention in recent decades. This paper has a practical aim with regard to this dialogue. We hope to highlight certain themes which would improve the management of common pool resources (CPRs) and the durability of CPR institutions.

Successful cases of common pool resource regimes demonstrate the fallacy of the popular assumption that communal resources will necessarily be overexploited. Recently, several authors have drawn on case studies of successful, and less successful, CPR institutions to develop principles for predicting when a CPR regime will form and the likelihood of its success once created (Bromley, 1992; Ostrom, 1990). Most of the case studies used by Ostrom to develop CPR principles are small-scale, isolated, self-organized institutions. Many evolved over hundreds of years. Many modern attempts to manage common pool resources however, involve multiple stakeholders with differing interests, dependence on external markets, and threats from outsiders. The urgency of environmental problems and the rarity of isolated communities in the world today make it important to examine the relevance of these principles to natural resource management systems in complex settings.

In developing countries, three critical issues often complicate the context in which institutions for collective action evolve: (a) reliance/dependence on outside organizations for financial and technical assistance, (b) dependence on markets for resource utilization, and (c) vulnerability to the larger political economy in which they operate. Few communities today, even in the most remote areas of the world, remain isolated from a cash economy. Many have been influenced by support from Northern donor agencies and nongovernmental organizations (NGOs). Thus, the relevance of emerging CPR principles to many communities in developing countries must be tested by examining institutions that have formed with external assistance and which are vulnerable to fluctuating markets and other aspects of the broader political economy of the region in which they operate.

This paper examines the development and dissolution of the Yanesha Forestry Cooperative (COFYAL)

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in Peru. It provides a partial test of the relevance of CPR design principles to indigenous forest management regimes involving multi-institutional project assistance and a complex set of influences. A combination of eight principles suggested by Ostrom (1990) and six principles that came out of the 1985 Conference on Common Property Resource Management in Annapolis, Maryland (Ostrom, 1992, p. 304) (see Table 1) is used to develop a synthesized list of eight design principles of successful CPR institutions. For several of these principles this paper suggests ways in which they can be expanded to make them more relevant to the variables affecting this particular case. This expanded CPR framework is then used to suggest ways in which external agencies can assist more effectively in the development of durable common pool resource institutions.

Our intention is not to establish a rigid set of design principles to be strictly adhered to in the development of projects, but rather to highlight specific issues which appear to be broadly relevant to communal natural resource management (and to some degree rural development in general). The term "principle" is used because it is used in the literature on which this paper is based and it emphasizes the notion that there are commonalities in successful CPR regimes that can be used by donors, development organizations, and governments to focus their efforts more constructively.

The Yanesha Forestry Cooperative (COFYAL) was created in May 1986 in an effort to manage sustainably some of the communal forests held by the Yanesha people of Peru (for information on the Yanesha see Santos-Granera, 1991 and Smith 1974). COFYAL was one component of the Central Selva Resource Management project (CSRM) located in the Palcazu valley of central Peru (for background information on the project and the cooperative see Stocks, 1990; Tosi, 1988 and Benavides and Pariona, 1995). The project was funded by the United States Agency for International Development (USAID) in conjunction with the Government of Peru and was implemented by Peruvian personnel with the assistance of foreign advisors. After USAID's departure in late 1988, the World Wildlife Fund (WWF) took over the funding of COFYAL through a Peruvian organization, the Foundation for Nature Conservation (FPCN).

2. EIGHT DESIGN PRINCIPLES FOR A SUCCESSFUL CPR REGIME[1]

Ostrom's (1990, p. 90) design principles were derived from a set of long-enduring CPR institutions that were self-organized and are self-governed. They apply to organizations managing resources that appropriators depend on for survival — irrigation allotments and fishing locations, for example. Ostrom's framework for analyzing these cases focuses primarily on internal variables, such as key attributes of the appropriators (Ostrom, 1990, p. 56). This focus is probably due to her choice of cases which all involve relatively isolated, autonomous communities.

In the case of COFYAL, the institution was established in a dynamic context, was only partially self-organized, and was developed to manage a resource not perceived as essential to the Yanesha's livelihood. While some of the specific variables important to this particular case may be unique to COFYAL, the more general issues — e.g., an indigenous group being rapidly assimilated into a regional economy, pressure on the resources from outside groups, governmental ambiguity, and donor involvement — are common to many resource management dilemmas around the world. Thus, if Ostrom's (1990, 1992) eight principles of successful CPRs listed in Table 1 are not relevant to this case, their relevancy to many modern resource management problems is called into question.

Clearly, given the complexity of this case, one must make an attempt to go beyond Ostrom's principles. Expanded versions of several of her design principles are proposed. It is hoped that this will provide a starting point for the modification of Ostrom's design principles to better reflect the variables that challenge CPR institutions established in dynamic settings, influenced by external actors, and vulnerable to considerable exogenous change.

(a) *Design Principle 1 — The resource and the users of the resource are clearly defined, and the appropriators are able to sustain legal claims as owners of the resource*

Both aspects of this design principle — clear definition of the resource and its users and legal claim to the resource — were met by COFYAL. Satisfying these two conditions was, for COFYAL, insufficient, however, to make the resource defensible from outsiders.

> For any appropriators to have a minimal interest in coordinating patterns of appropriation and provision, some set of appropriators must be able to exclude others from access and appropriation rights (Ostrom, 1990, p. 91).

For the cases Ostrom examined, clear definition and legal claims were apparently adequate to enable appropriators to exclude outsiders. For the Yanesha of the Palcazu valley, however, meeting these conditions was not adequate to ensure defensibility of the resource. Thus, to be relevant to the situation in which COFYAL was operating, this principle should be expanded to include a broader set of conditions for defensibility of the resource and secure resource tenure.

The boundaries of the Yanesha communities were clearly defined following the promulgation of Peru's

Table 1. *Original and expanded design principles for durable common pool resource institutions*

Ostrom's (1990, 1992) design principles	Met by COFYAL?	Authors' expansion of Ostrom's design principles	Met by COFYAL?
1 The resource and the users of the resource are clearly defined, and the appropriators are able to sustain legal claims as owners of the resource.*	YES	The resource itself and the users of the resource are clearly defined, and the appropriators are able to effectively defend the resource from outsiders.	NO
2 The appropriator organization devises a small set of simple rules related to access and use patterns agreed to by the appropriators which is congruent with local conditions and provision rules.*	NO	Appropriation and provision rules are congruent with the resource and with the cultural norms and social and economic patterns of interaction of the appropriators. The pace and scale of the institution are congruent with traditional decision-making processes.	NO
3 Most individuals affected by the operational rules of the appropriator organization can participate in modifying these rules.†	NO	–	
4 Monitors, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators or are the appropriators.†	N/A‡	–	
5 Appropriators who violate operational rules are likely to be assessed graduated sanctions by other appropriators, by officials accountable to these appropriators, or by both.†	N/A‡	–	
6 Appropriators and their officials have rapid access to low-cost, internally adaptive conflict resolution mechanisms to resolve disputes among appropriators or between appropriators and officials.*	NO	–	
7 The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.†	YES	The rights and ability of appropriators to devise their own institutions are not challenged by any other authorities, internal or external, that have the ability to undermine the institutions.	NO
8 For CPR institutions that are part of larger systems, appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises which reinforce the legitimacy of the institutions.*	NO	For CPR institutions that are part of larger systems, the main forces in the broader political economy do not hinder institutional development.	NO

*After Ostrom, 1990: 90–102.
†Synthesis of Ostrom, 1990: 90–102; 1992: 304–8.
‡N/A – Not applicable and/or insufficient data.

1974 Law of Native Communities. One of the conditions mandated by USAID for supporting the Palcazu Project was that the Peruvian government had to legally recognize all native communities which had not yet received title. Thus, by the time of the creation of COFYAL, all of the Yanesha communities had received title to their lands. This titling effort has been described as one of the major successes of the CSRM project (Stocks, 1988). Having legal title to their land was obviously a prerequisite to the Yanesha clearly defining the boundaries of their forests, as well as their legal right to defend these forests.

The appropriators with rights to profits from the cooperative were clearly established through formal agreements. Clear guidelines were set governing the extent of the cooperative's access to community lands and the proportion of profits to be distributed to community leaders (Stocks, personal communication). The way in which each community leader would distribute the funds within the communities was not formally defined, however. This did not seem to be much of an issue for the cooperative, however, as it was only able to distribute funds in one year, 1991 (Pariona, personal communication).

Thus, Ostrom's conditions for Design Principle 1 appear to have been met by COFYAL. These conditions, important because of their role in allowing appropriators to defend the CPR, are not adequate, however, for the situation facing the Yanesha's forest resources. The Palcazu Yanesha have a long history of insecure land tenure, encompassing several hundred years of exploitation and alienation from lands they held legally but were not able to defend from Franciscan missions or European and Mestizo colonists (Smith, 1974). In addition, at the time that COFYAL was developed, the Palcazu communities were facing increasing population pressure due to immigration from neighboring Yanesha communities (Santos-Granero, 1991). In 1981, the Yanesha communities of the Palcazu experienced an annual growth rate of 4.5% (Smith, 1982 cited in Benavides and Pariona, 1995). Finally, pressure from colonists coming to the valley increased in the early 1980s as a result of the new road (Benavides and Pariona, 1995). While some project staff felt that the Yanesha were able to resist land invasion as a result of this project (Stocks, 1988; Simeone, 1990), others have concluded that, even with formal title, the Yanesha would still have been unable successfully to defend their land against a significant influx of colonists. "There was no proposed mechanism to guarantee that the native community lands to be titled could be defended against invasions of loggers, traders, and colonists once the road came in," and the communities' attempts to resist illegal timber harvesting on their lands by road-building crews were not always successful (Bayley *et al.*, 1981, pp. 17, 19). Another USAID consultant has expressed some doubt that "the GOP will have either the resources or the will to control the spontaneous colonizations and lumbering of the area if project funds are not forthcoming" (Bayley *et al.*, 1981; B4). The Yanesha's past experiences combined with recent population pressures and threats of colonist invasion make it unlikely that formal land titling alone was enough to give the Yanesha adequate tenure security to give them the incentive to manage for long-term benefits.[2]

Tenure security is necessary for the development and survival of CPR institutions because appropriators have no incentive to invest in an institution to manage their resources if they believe those resources could be invaded by outsiders.

If a CPR can be destroyed by the actions of others, no matter what local appropriators do, even those who have constrained their harvesting from a CPR for many years will begin to heavily discount future returns (Ostrom 1990, p. 35).

This prediction seems to hold true for the Palcazu Yanesha, who, under these conditions, expressed a primary interest in the short-term profitability of the forests. While they were aware of, and concerned about, the ecological importance of the forests, particularly for watershed protection, the communities were more concerned with immediate cash returns from the resource (Stocks, personal communication). This emphasis on short-term profits may have been motivated by feelings of insecurity about their ability to protect their lands from colonists and other outsiders.

In a situation in which tenure security of the forests is uncertain as a result of past displacement and/or current pressures from outside groups, this design principle should be expanded to include tenure security of the resource, in addition to clearly defined boundaries and appropriator rights. In the case of the Palcazu Yanesha, land titling was a necessary but not sufficient condition for meeting this expanded principle. There is evidence from case histories of other community forestry projects in Latin America to suggest that this expansion may be relevant for other such institutions facing similar pressures on their forest resources (Forster and Stanfield, 1994).

Thus, the following expanded design principle is proposed:

> The resource itself and the users of the resource are clearly defined, and the appropriators are able to effectively protect the resource from outsiders.

(b) *Design Principle 2 — The appropriator organization devises a small set of simple rules related to access and use patterns agreed to by the appropriators which are congruent with local conditions and provision rules*

There are a number of conditions here, only some of which were met by COFYAL. This combined design principle focuses on the congruence between appropriation and provision rules and local conditions, and the simplicity of those rules. We propose to expand the principle to address more than appropriation and provision rules and to broaden the concept of "local condition" to encompass much wider physical, social and economic considerations. We base this change on an analysis of the appropriateness of COFYAL as an institution, and the strip shelterwood extractive system used by COFYAL. First, however, we will examine COFYAL from the point of view of the original design principle.

(i) *Analysis of the fit of Design Principle 2*

The first issue to consider is whether the appropriation rules were related to local conditions. Ostrom uses the term "local conditions" to refer to the attributes of the resource. For example, in situations where the resource is very scarce, one would expect to see more rigid use rules. Ostrom (1990, p. 92) uses the example of four Spanish *heurtas* (irrigation systems), in which, although "located in close proximity to one another, the specific rules for the various *huertas* differ rather substantially." In each case the rules are finely tuned to fit the characteristics of the resource supply. The strip shelterwood method was chosen by tropical forest scientists from the Tropical Science Center because they believed this method of extraction was appropriate, from an ecological perspective, for the Palcazu Valley.[3] The rules of extraction resulted from a blending of Western scientific and local traditional ecological knowledge of the valley forests (Lázaro, Pariona and Simeone, 1993). Using Ostrom's narrow interpretation of "local conditions," therefore, the institution seemed to meet this aspect of the design principle.

Another aspect of this design principle is congruence between the appropriation rules and provision rules; in other words, appropriators who contribute more to maintenance of the system should receive more benefits from the system (Ostrom, 1990, p. 92). This aspect was met through COFYAL and its relationship to the communities. The members of the cooperative who performed the administrative and technical functions of the strip shelterwood operation were salaried workers; they benefited the most from the institution. Community members who did not invest labor in the enterprise but who had a legal stake in the forests were to benefit from a distribution of the profits from the enterprise.

A third issue is whether the set of rules governing the management of COFYAL and distribution of resources among the communities was small and simple. The answer here is an unequivocal no. COFYAL was one part of the Central Selva Resource Management Project, funded by USAID and the government of Peru. The project was a part of the Special Project Pichis-Palcazu, funded by several international agencies in addition to the Peruvian Government. Thus the institution faced not one set of simple rules, but several sets of complex and, sometimes contradictory, expectations and rules. Governance of the project was unclear to the USAID project staff working directly with COFYAL (Tosi, 1988, p. 4); it was probably even more confusing to the Yanesha community members who were less closely involved in its operations.

A fourth issue is whether the rule system was "agreed to by the appropriators." The process by which project staff worked with communities to define and design the institution for forest management utilized traditional decision-making structures, principally informal town meetings. One could argue that this process should have resulted in a system that was acceptable to all community members. Conflicts between COFYAL and the Federation of Yanesha Native Communities (FECONAYA) indicate, however, that some members of the communities did not support all the rules, particularly the income distribution rules (Stocks, 1988). In addition, many of the rules of COFYAL were set to comply with established Peruvian cooperative law. This legitimized COFYAL as a cooperative, but removed some of the Yanesha's autonomy to run the operation as they saw fit.

(ii) *Analysis of COFYAL as an institution*

Ostrom defines the parameters that must be congruent very narrowly. To explain some of the most significant problems with COFYAL, we must expand the discussion of congruence between appropriation and provision rules and local conditions beyond the nature of the resource and ask whether the institution itself was appropriate to the social customs, relationships and norms of the communities involved. This broader question was not an issue for the cases Ostrom used to develop design principles because the nine CPR regimes used were self-organized; one would not expect that self-organized appropriator institutions would develop that were inappropriate to the social settings in which they emerged. Donor-initiated projects, however, always run the risk of devising solutions to resource management problems that are inappropriate to local conditions in any number of ways; indeed, there is a large literature on development projects that have failed for just those reasons.

COFYAL was not congruent with Yanesha society in at least four ways. First, a multicommunity institution was incongruent with the social organization of these communities, which have no communal economic associations (Stocks, personal communication). The cooperative structure was chosen "because this structure resembles the Yanesha's traditional way to decide communal issues" (Lázaro, Pariona and Simeone, 1993, p. 49). But while the Yanesha have a history of gathering at the community level for religious and social reasons, they have little or no history of communal organization for economic reasons. Economic transactions occur primarily at the kin-based level, not the community level, in these Yanesha communities (Smith, 1974; Stocks, 1988). The Yanesha have no tradition of dividing labor for maintenance of communally owned resources (Stocks, personal communication). The development of COFYAL was therefore an attempt to create an enduring resource management institution among several communities which had no history of economic organization either within or among themselves.

Second, the new native communities lacked strong social bonds. The ability to predict the behavior of others is seen as critical to the success of durable CPR regimes. CPR regimes tend to develop among communities that are small and stable, and that are easy to monitor. A CPR institution is more likely to be successful in a community in which the members feel confident that most other members will honor the appropriation rules. While the four Yanesha communities participating in forest extraction through COFYAL shared ethnicity, they were recently formed, artificial congregations of kin-groups with little history of cooperation. The native communities that were titled as a result of the CSRM project were "totally artificial constructions" that did not match historical social units, and "each community had its own lands and own interests with little cooperation on any but the political level" (Stocks, personal communication). Thus, the assumption that a multi-community cooperative institution made sense in this situation was perhaps unfounded.

Third, the organizational structure of COFYAL and its business relationship with the communities were incongruent with social norms. Yanesha society is characterized by social bonds of family ties, gift giving and reciprocity. "By generating a perpetual cycle of exchanges, the gift economy binds all members of a local community through their reciprocal obligations to one another" (Smith, 1995, p. 2). When asked for something, Yanesha will often give it because they are at once being generous, raising their status in the community and creating a bond of reciprocity. The Yanesha are also an egalitarian society with little experience of, or respect for, hierarchical forms of management (Smith, personal communication). These aspects of their culture were incongruent with the hierarchical, profit-motivated aspects of the cooperative and resulted in numerous problems (Pariona, personal communication). For example, COFYAL staff would be asked by community members for loans from cooperative funds or the use of cooperative equipment and the staff would find it difficult to refuse. COFYAL had to be run efficiently to be economically viable, but was operating subject to the cultural traditions of the Yanesha which, at times, worked against its smooth functioning.

Finally, and related to the issue of congruence between the institution and local norms, is the issue of leadership within COFYAL. The importance of leadership to the development of a CPR institution has not received much attention in the literature, perhaps due to the fact that, for most enduring CPR regimes, it is difficult to determine how the institutions evolved and whether leadership played an important role. In the case of COFYAL, cooperative employees, particularly management staff, were selected by the Forestry Development Unit staff based on their demonstrated skill and progress during training. Thus, we must consider whether these leaders are the same ones who would have emerged had the community self-organized to create a CPR institution, and what effect the leadership had on the viability of the institution. One impact of project-selected leadership was evident. The long-time manager of COFYAL, Manuel Lázaro, was actually a Campa (Ashaninka) Indian, not a Yanesha, and this served to heighten resentment toward the leaders of the cooperative (Pariona, personal communication).

(iii) *Analysis of the extractive system used by COFYAL*

The concept of "local conditions" must also be expanded to include the geographic constraints and socioeconomic context of the Palcazu valley, which posed a number of problems for the extraction system chosen. There are many ways in which the technology employed by COFYAL was not appropriate for the Yanesha, which are detailed in a number of accounts and official documents describing the project (see, for example, Stocks, 1988; CASA, 1994; Benavides and Pariona, 1995). If the appropriateness of the strip shelterwood system is examined in a broader sense, within the physical and economic context of the Palcazu valley, one finds considerable evidence to suggest a lack of congruence, particularly with respect to issues of market dependence and pace and scale of operations.

The tropical forests of the Palcazu valley are highly diverse, often containing hundreds of species per several hectares. This condition created a challenge for the cooperative, which aimed to use all these species in a productive manner. In order to take advantage of as much of the harvest as possible, COFYAL established processing facilities which included a sawmill, a carpentry shop, "a bank of PresCaps for preserving small-dimension roundwood" (Hartshorn and Pariona, 1993, p. 159), and a kiln for charcoal production. Although some preliminary market studies were undertaken to assess the economic viability of the cooperative, their results turned out to be overly optimistic. In the mid-1980s, there was a market for only a handful of the most valuable timber species. In addition, while sales of charcoal were unexpectedly brisk, projected markets for poles never developed. COFYAL only made a profit one year (Pariona, personal communication), and then only as a result of the sale of scarce, high-quality timber abroad. For this harvesting system to have been economically viable in the Palcazu, COFYAL had to have consistent access to stable and diverse markets of forest products. These markets were not present and were never developed. This was one of the primary reasons for the failure of the cooperative. Thus, this extractive system was probably not congruent with "local conditions," as we have defined the term, particularly with respect to market constraints.

The strip shelterwood system and the structure of the cooperative required to maintain it resulted in a scale of operations that was incongruent with local capacity. The system required reliable access to imported equipment and materials and extensive training of personnel who were already busy in a wide variety of activities. Not only was a large amount of equipment imported, but the PresCap system required a steady supply of preserving chemicals which could only be obtained abroad. The fact that so much had to be imported is probably a sign of instability, but the point here is that the system was large scale from the beginning.

Relative to the small-scale kin groups in which the Yanesha were accustomed to working, COFYAL was a major enterprise requiring many diverse sets of skills. While the Yanesha were extremely knowledgeable about the forests, much of the harvesting and processing system was alien to them, for example, using oxen as draft animals, the wood-processing equipment, and Western accounting systems. In addition, the Yanesha were already fully employed in their subsistence activities, a fact overlooked by project designers. Some of the project staff proposed that cooperative workers be only part-time, but this was unacceptable to one of the funding organizations (Simeone, personal communication). There were difficulties with COFYAL employees neglecting their traditional subsistence and family duties, adding to the work burden of women in families with COFYAL workers (Lázaro, Pariona and Simeone, 1993).

The pace of the development of COFYAL, directly related to the scale, was also incongruent with local conditions. Project staff did not give sufficient attention to the pace of development in Yanesha society (Simeone, 1990). To project personnel, the project might have seemed very slow at times. But relative to the pace the Yanesha were used to in a (previously) remote valley living largely subsistence lifestyles, the pace of the project was perhaps too rapid. The Yanesha had little time to become accustomed to the new ways and adapt to the encroaching market economy. A forest management consultant on the project recently summed up the approach taken as follows: "we began at the end, we didn't start at the beginning" (Simeone, personal communication).

The pace of change was particularly incongruent given the state of economic transition, even chaos, facing the communities at the time of the project. Before being introduced to a cash economy in the late 19th century, exchange among the Yanesha, like many indigenous Amazonian groups, was structured by a "gift economy" (Smith, 1995). The modern market economy, which emphasizes the accumulation of wealth, rather than wealth sharing, as a means of gaining status, is fundamentally at odds with the gift economy. The contradiction between the two leaves societies such as the Yanesha confused about which situations warrant market economy behavior and which should be governed by gift exchange principles (Smith, 1995). The Yanesha communities that worked with project staff to develop a communal forest management system not only had no tradition of economic intra- or multi-community institutions or cooperation, they were also in a state of transition characterized by great confusion about social norms. Thus, the transactions costs for communal management of their forests, even as subsidized by donors, were probably very high, with community members not sure what behavior to expect from each other.

Thus, a revised design principle that accommodates these issues might read as follows:

> Appropriation and provision rules are congruent with the resource, market conditions, and with the cultural norms and social and economic patterns of interaction of the appropriators. The pace and scale of the institution are congruent with traditional decision-making processes.

(c) *Design Principle 3 — Most individuals affected by the operational rules can participate in modifying these rules*

The ability of appropriators to modify the rules of a CPR regime is critical because in settings that are complex and change over time, "it would be almost impossible to 'get the operational rules right' on the first try, or even after several tries" (Ostrom, 1990, p. 58). Adapting rules to changing conditions is easier if the costs of doing so are low, and these costs are lower if the individuals affected by the rules can participate in modifying them (Ostrom, 1990, p. 93). COFYAL largely failed to meet this design principle, which may have been a significant factor in its dissolution.

COFYAL can be viewed as having two sets of rule structures, one internal and one external. The internal rule structure can be further divided into formal rules of operation, which were developed with project assistance, and working relationships and relationships between the cooperative and the communities which were guided by informal social norms. The formal rules of operation were shaped largely by legal guidelines for the management of cooperatives in

Peru. Distribution rules for cooperative profits were decided through consensus among COFYAL members, who decided to distribute a certain percentage of earnings to the communities (Stocks, personal communication). Cooperative working relationships, and relationships between the cooperative and the communities, were influenced strongly by Yanesha social norms.

At the same time, COFYAL was governed by external rule systems because of its status as a recipient of donor funds from USAID and the World Wildlife Fund (WWF). Thus, the collective-choice arrangements were complex, with widely differing roles for project staff, COFYAL members and leaders, and community members and leaders. Thus, this design principle was only met to a very limited degree, the complexity of the institutional structure precluding otherwise.

Members and employees of COFYAL were able to adapt the operational procedures of the cooperative to evolving circumstances. The day-to-day operation of the cooperative appears to have been highly flexible, perhaps too flexible. By some accounts COFYAL was hindered by the lack of a functional hierarchy and an absence of strict operational procedures (Pariona, personal communication). With respect to the extraction method and the distribution of benefits, however, the rules were less flexible. The relationship between COFYAL and the communities was outlined in a formal agreement, which included the percentage of profits to be shared with the communities. There were no formal mechanisms in place for COFYAL or community members to register a complaint about COFYAL's progress or make adjustments to the extraction system or distribution rules. In addition, the scale of the extraction technology, noted above, and its enthusiastic endorsement by project foresters, made it unlikely that the members of COFYAL or the communities could have successfully implemented a change in the method of extraction.

There were no clear methods for community members to change the rules if they felt that forest management through COFYAL was not working to their satisfaction, or if factors affecting the profitability of the cooperative (e.g., guerrilla activity, slow road-building progress) changed. There were no mechanisms in place for community members to have input in changing the extraction system or distribution rules. As mentioned, tension grew between some of the communities and the cooperative when COFYAL failed to earn profits which were to be distributed to the communities as payment for the use of their forests (Benavides and Pariona, 1995). As a result of this factor and other management-related problems described above, community members eventually abandoned the forest management scheme and resumed private sales of timber to logging companies in 1993 (Pariona, personal communication).

Another consequence of nonparticipatory collective choice arrangements within the forest management regime was an absence of a feeling of ownership. While the cooperative was managed by Yanesha (although the general manager was a Campa), its accountability to and dependence on project managers and funds resulted in an institution that was not self-governed. "For a lot of Yanesha, even after [it] was up and running . . . [COFYAL was] thought of as . . . a coop thing, a project thing — not our thing" (Stocks, personal communication). While the goal of the project was for the cooperative to eventually be completely owned and governed by the Yanesha, the institution dissolved before reaching autonomy in any real sense.[4] A feeling of "being needed," that one has an important role to play in solving a social problem, is important to inspiring individuals to participate (Kaplan, 1990). Many Yanesha felt that the cooperative was the project's not theirs to manage, which probably made them much less committed to its survival (Pariona, personal communication).

Finally, it is important to point out that the typical project time frame of donor agencies, usually five years or so, and the pressure for implementing organizations and project staff to demonstrate "results" within that time frame, make fulfilling this condition particularly problematic for donor-supported CPR institutions. Case studies of durable CPR regimes indicate that "getting the rules rights" happens slowly, over long-periods (Ostrom, 1990). While USAID and other lending agencies are beginning to plan longer term sustainable development projects (ENRIC, 1994), these agencies also need to refocus their evaluation criteria to reflect how well projects lay the groundwork for sociocultural, as well as environmental and economic, sustainability. For many agencies it is far easier (and it appears "normal") to spend vast amounts of money on physical items than to invest effectively and profitably in organization building . . . [yet] the investments in physical infrastructure alone may be wasted, if the incremental expenditures for developing social organizations and human capital are not made (Cernea, 1993, p. 25).

(d) *Design Principle 4 — Monitors, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators or are the appropriators*

The importance of this design principle is clear when one examines self-governed CPR regimes where the primary perceived threat is from other appropriators. With the creation of COFYAL as a management institution, however, the four Yanesha communities stopped selling timber from their lands to outside buyers (Stocks, 1988). There was strong communal resolve to act responsibly as long as there was an expectation of deriving income from COFYAL's activities. There is no evidence of a system of monitoring each other's behavior, and the Yanesha's resolve lasted a few years until various factors combined to erode expectations of deriving benefits.

The importance of this design principle is less clear when, as in the case of COFYAL, the primary threat comes from external elements. Based on the limited available information, despite a threat from colonists and loggers, there were no formal mechanisms of forest monitoring. Formal monitoring did not seem to be very important to the maintenance of the CPR regime. The Yanesha probably monitored timber harvesting informally, however, through their everyday use of the forest and through awareness of who was selling timber and to whom. In fact, the Yanesha were well aware of encroachment into their forests, especially along the road, and dealt with these threats directly (Stocks, personal communication).

Because COFYAL had obligations to the communities, most importantly in the form of cash payments, the question rises as to the need for monitoring of COYFAL's accounting system by the communities. COFYAL set up a book-keeping system whereby the accountant was to maintain a record for each community detailing the volume of timber extracted and the amount sold (Benavides and Pariona, 1995). It is unclear who, if anyone, in the communities was responsible for reviewing the books and identifying any apparent discrepancies. Monitoring was made particularly difficult due to the general lack of experience with timber processing which made it unlikely that community members knew what to expect. In addition, the presence of project staff may have served to minimize the need for external monitoring. There is no evidence that the communities questioned the ability of COFYAL to successfully manage their forest stands, or its honesty in distributing benefits, despite their limited ability to judge the progress of the operation. Monitoring, whether of themselves, outsiders or COFYAL, did not seem to play a significant role in the maintenance or dissolution of the cooperative.

(e) *Design Principle 5 — Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to these appropriators, or by both*

There are data on only two instances of "rule" violations: (i) a staff member of COFYAL who sold timber outside the cooperative; and (ii) a village *jefe* (leader) who resisted ceding communal land to COFYAL because he was selling timber from the communal forests. These cases seemed to have been dealt with according to the circumstances: the staff member was removed from his position of leadership, and the *jefe* was overruled (Hartshorn and Pariona, 1993; Stocks, personal communication). There is no evidence of any formal system of sanctions, graduated or otherwise.

Graduated sanctions are common in long-enduring CPR institutions because they allow flexibility in the system. A person who is normally a rule follower but who is in dire need of a resource and therefore cheats can be treated leniently compared to a repeat offender who shows little allegiance to the rule structure of the institution. This flexibility seems to strengthen the CPR management institution in the long run. Whether the issue of sanctions was dealt with within Yanesha social norms or whether it was seen as an unimportant institutional element is difficult to determine from the information available. Regardless, it appears that COFYAL's sanctioning system, or lack thereof, was not a major factor in its institutional weakness.

(f) *Design Principle 6 — Appropriators and their officials have rapid access to low-cost, internally adaptive conflict resolution mechanisms to resolve disputes among appropriators or between appropriators and officials*

There are three points to be made regarding conflict-resolution mechanisms. First, although the Yanesha communities have internal mechanisms for conflict resolution, these community arenas were never utilized to deal with conflicts internal to COFYAL. Second, the absence of a low-cost mechanism for resolving some of the disagreements between project staff, COFYAL members, and community members probably undermined the viability of the institution. Third, the presence of external stakeholders made conflict resolution very complicated.

The Yanesha, like many indigenous groups in Amazonia, are characterized by an egalitarian social structure. Community issues are dealt with at community meetings which can be lengthy and complicated. Problems are resolved in a consensual manner, topics being open for discussion as long as someone has something to say (Stocks, personal communication). This system of governance and dispute resolution has worked for the Yanesha for centuries, and certainly can be considered an adaptive mechanism. This forum, however, did not seem to be used to resolve problems related to COFYAL. One can only speculate on the reasons for this — possibly because the community felt that COFYAL belonged to the project, or the presence of different power relationships between COFYAL leaders, project staff, and community members — but what is clear is that this mechanism failed to meet the requirements for a low-cost arena in which CPR institution conflicts could be resolved.

The rules governing the management of COFYAL also failed to provide a low-cost, easily accessed conflict resolution arena. Unfortunately, little is known about the internal decision-making process of the cooperative. One situation on which there is information involves the provision rules of the COFYAL employees. The cooperative's employees were facing difficulties maintaining their subsistence farming and household duties because of the time demands of COFYAL. This problem was eventually resolved by rearranging schedules. So there was resolution of some of the conflicts that rose within COFYAL. These processes were not rapid, however, and, although low in cost monetarily, they involved substantial transactions costs in time and effort (Stocks, personal communication). As in the case of collective-choice arrangements, the general state of confusion of Yanesha social and economic institutions at the time of the project probably served to complicate this aspect of CPR management.

Conflict resolution was also complicated by the fact that the cooperative was accountable to external, as well as internal, stakeholders: project staff, CSRM officials, USAID personnel in Lima and Washington, DC, and later, the FPCN and WWF. Project staff were actively involved in COFYAL's management at different times and in different ways. It is impossible to assess how non-Yanesha contributors affected conflict resolution processes and outcomes. COFYAL itself never had the opportunity to mature, and it is therefore likely that conflict resolution mechanisms were similarly in flux.

(g) *Design Principle 7 — The rights of appropriators to devise their own institutions are not challenged by external governmental authorities*

If we consider COFYAL to have been "devised by" the appropriators themselves, this design principle was certainly met by the project. In fact, the government, along with USAID and project personnel, actively fostered the creation of COFYAL. But in analyzing the autonomy of the Yanesha — the authority of the appropriators to devise the institution themselves — the extent to which the cooperative met this design principle is called into question. In assessing this issue one must examine the actors — both external and internal to the Yanesha — who had an impact on the cooperative during its formative stage. It is proposed that this design principle be expanded two ways, externally and internally. Externally, not only the government's policies, but the role of USAID and project personnel in designing the institution must be addressed. An internal authority, FECONAYA, which clearly questioned the validity of COFYAL and had an impact on its viability, must also be accommodated.

Ostrom (1990, p. 101) argues that

> . . . if external governmental officials presume that only they have the authority to set the rules, then it will be very difficult for local appropriators to sustain a rule-governed CPR over the long run.

The same argument seems to hold true for other external agents. To be more relevant to donor-supported CPR institutions, this design principle should consider whether other external agents or organizations with a stake in the CPR recognize the rights of the appropriators to develop and define the characteristics and rules of the institution themselves, rather than having the appropriation rules prescribed in a project paper.

In the case of COFYAL, the decision to form a multi-community cooperative to manage the forest was reached through a project-facilitated process that utilized some traditional decision-making structures of the Yanesha, such as community meetings (Stocks, personal communication). Although the application of the strip shelterwood system to the Yanesha forests was based on a combination of project technical expertise and local ecological and topographic knowledge, however, the project paper had predetermined the use of the strip shelterwood extraction system. The lack of ownership community members felt toward the cooperative indicates that the level of autonomy given the Yanesha was not adequate (Pariona, personal communication). While it is difficult to determine just how significant the question of who devised the institution was for its durability, it was certainly important enough to point to a need to expand this design principle to include all external authorities, not solely governmental ones.

A second way in which the design principle should be expanded to accommodate the complex social setting in which COFYAL emerged is to consider internal authorities that might question the authority of the appropriators to devise a CPR institution. Ostrom's design principle does not fully consider the potential influence of relationships between an appropriator organization and other local organizations. FECONAYA, the Federation of Yanesha Native Communities, was hostile to the idea of the cooperative because of its general antipathy toward the CSRM project (Stocks, 1988). This resentment stemmed from the original colonization focus of the project as designed by the Peruvian government and early project activities that were poorly implemented.

> Project personnel had strong resentments toward . . . FECONAYA, and tended to characterize the Amuesha as backward and lazy, while the Amuesha had many complaints about project promises unkept (Stocks, 1988, p. 6).

FECONAYA viewed the development of COFYAL as a project activity and therefore resented the power and resources it held. As mentioned, the organization tried, unsuccessfully, to influence the provision rules by persuading cooperative leaders to distribute profits to FECONAYA, but COFYAL leaders decided instead to funnel a share of its profits to the leaders of each community. While COFYAL was able to emerge without giving in to the demands of FECONAYA, the tension between the two institutions continued to be a source of problems (Stocks, personal communication) and may have contributed to the failure of the cooperative. Thus, to be relevant to situations such as this, in which an appropriator organization may be at odds, or in competition, with another local organization, this design principle should also be expanded to include internal governmental and social institutions as well as external authorities.

In conclusion, both internal and external governmental and nongovernmental authorities may undermine modern CPR institutions, as evidenced by the experience of COFYAL. An expanded design principle might read:

> The rights and ability of appropriators to devise their own institutions are not challenged by any other authorities, internal or external, that have the ability to undermine the institution.

(h) *Design Principle 8 — For CPR institutions that are part of larger systems, appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises which reinforce the legitimacy of the institutions*

In this design principle Ostrom mainly addresses complex, physically interconnected, appropriation systems, and only briefly touches on the larger political context. An example is a Philippine irrigation system which has rule structures for tertiary canals nested within a broader set of rules for secondary canals. In the case of COFYAL, the issue was not its functioning within a larger appropriation system but its functioning within a larger political economy. The context of non-isolated, market dependent CPR regimes is of great importance, especially when considering what role outside actors can play in institutional development and strengthening. Indeed, key elements of COFYAL's development and dissolution were external factors. It is felt, therefore, that it is appropriate to broaden this design principle to include the larger political economy — the context of CPR institutional development. Within this is included the issue of exogenous change, which Ostrom discusses in another context (Ostrom, 1992, p. 302).

COFYAL was affected continuously by external actors. Because it was an element of a "development" project, COFYAL was dependent on, and influenced by, PEPP (the Peruvian arm of the project), USAID, WWF, the FPCN (the domestic, nongovernmental organization through which WWF funneled support), and the Peruvian government. In addition, because of recent Yanesha history and the geographical location of the Palcazu Valley, COFYAL was affected by FECONAYA, the valley's large mestizo community, and the Shining Path guerrilla movement's activities. The issue in this type of circumstance seems to be whether the larger political economy can foster the creation of durable CPR institutions and, if so, under what conditions. A detailed look at how these actors influenced COFYAL will help us understand the political economy that affected this CPR institution.

Because PEPP was the primary implementing institution, PEPP personnel had a large impact on COFYAL. From the beginning, there was resentment toward the forestry component stemming from a belief by most PEPP personnel that the Project should be focused on agriculture and colonization. This attitude was heightened by the general view which the Peruvian staff held toward the Indians — they were seen as lazy and backward (Stocks, 1988). PEPP controlled the use of project equipment as well as the disbursement of funds for the forestry component's activities. At times, COFYAL's operation was significantly hampered by this relationship, especially during the procurement phase for the sawmill (Stocks, 1988). Because the extraction system required large amounts of imported equipment and supplies, PEPP had significant leverage over COFYAL's progress. Clearly, this condition did not foster COFYAL's development, as PEPP was often slow and uncooperative.

From the beginning of the project, USAID was a significant determining factor in the political economy of the Palcazu Valley. From the scale and content of the project design to the choice of consultants to the disbursement regulations for project monies, USAID strongly influenced project development. The initial absence of a social component in project design, the short time-frame of USAID projects (five years), its preference for large-scale endeavors and its sensitivity to insurgent activity, all had negative impacts on COFYAL. On the other hand, the leverage USAID had over PEPP was instrumental in getting COFYAL started and equipped and its personnel trained. As mentioned, USAID was also instrumental in the native communities acquiring title to their lands, a major benefit of the project and a crucial step in the process of fostering communal management of the Yanesha's forests.

After USAID pulled out in 1988 due to the presence of the Shining Path, the World Wildlife Fund began supporting COFYAL through the FPCN. WWF required regular reports from COFYAL and, when these reports stopped coming in 1993, WWF withdrew its support. The primary reason for this eventual breakdown, according to project personnel, was the imposition by the FPCN of a new, non-indigenous manager of the cooperative (Pariona, personal communication). Thus COFYAL dissolved shortly after the removal of its indigenous management. WWF and the FPCN were both part of the larger context of COFYAL's development and dissolution.

The Peruvian government's priorities were important to the political context within which the Project evolved. The major point of interest with regard to the GOP was that there was a change of administration in 1985. The new Garcia administration was less interested in Amazonian development and its personnel less experienced in the management of government agencies. This caused delays in project implementation and a shift in priorities.

In the late 1980s, the Shining Path entered the valley. Their activities included threatening and kidnapping wealthy mestizos and, in some cases, violence (Pariona, personal communication). Although apparently not affecting the Yanesha directly, their presence drove away USAID and affected local markets. Both these factors impacted COFYAL.

The politics and economy of the Palcazu valley were thoroughly dominated by relatively wealthy mestizos of European descent. Over the years, the mestizos had come to own most of the good valley bottom land. The cattle industry, the primary source of cash in the valley, was controlled by them, as were most of the businesses which imported goods from Lima. Many Yanesha were entrenched in a system of debt peonage with the wealthier landowners, working as day laborers or taking care of the landowners' cattle.

Finally, the dependence of COFYAL on market conditions left it very vulnerable. "Rapid trade liberalization and other sudden policy changes can potentially overwhelm existent tenure regimes and sustainable management systems" in Latin America (Forster and Stanfield, 1994, p. vii). The marketing plan for COFYAL did not provide any "buffering" for such changes affecting the profitability of its products. Some of the anticipated markets never even materialized, hindering the ability of COFYAL to make a profit (Lázaro, Parione and Simeone, 1993).

The complex and dynamic nature of the political economy of the valley clearly had a strong impact on COFYAL in many ways. Although this case might be more complicated than most, evidence from other indigenous forest management projects in Latin America corroborates the need to examine the larger political economy of any situation when contemplating or implementing some sort of intervention (Forster and Stanfield, 1994). A redefined design principle dealing with the political economy of an area must necessarily be somewhat broad in scope, as the processes of fostering CPR institutional development in complex circumstances must be situation specific. It is proposed that the design principle be restated:

> For CPR institutions that are part of larger systems, the main forces in the broader political economy don't hinder institutional development.

3. RECOMMENDATIONS

We chose to analyze this case because, in addition to being strongly influenced by external factors, COFYAL was not self-organized. COFYAL was characteristic of many forest management enterprises involving indigenous peoples in that it was developed as part of a donor-initiated project. In addition to expanding Ostrom's eight principles based on evidence from this case, we will examine the implications of the expanded design principles for external organizations interested in assisting the development of indigenous communal forestry enterprises.

Before expanding the analysis one must first ask whether there is any role for external actors in the development of indigenous communal enterprises. An assessment of the situation facing the Yanesha preproject indicates that there was an important role for outsiders to play. Because of the complex forest exploitation situation facing the Yanesha prior to the CSRM project, and their lack of control over it, it is unlikely the Yanesha would have been able to improve their situation — or protect their forests — without outside intervention. The financial clout of USAID was critical in forcing the government of Peru to officially recognize and legally title all Yanesha communities in the project area to help protect them from colonist invasion (Hartshorn, personal communication). In addition, prior to the project the Yanesha had already expressed a desire to process logs themselves but did not have access to the capital needed to buy a sawmill. Thus, external assistance was needed both to help protect the Yanesha's forest resources from outsiders and to subsidize the transformation costs of developing the system for resource extraction. In addition, the change of emphasis in the target groups of the CSRM project from colonists and large landholders to the Yanesha was due at least in part to the work of US and British indigenous rights organizations publicizing the plight of the Yanesha (Stocks, personal communication). The experiences of other community forest enterprises in Latin America (see Forster and Stanfield, 1994) and the case in Sri Lanka described by Ostrom (1990) indicate that there is a role for outsiders in other similar situations.

Having determined a need for external assistance in many indigenous resource management dilemmas, one must then ask what the most appropriate role of outside agents would be in the development and maintenance of a CPR institution. The experience of COFYAL provides evidence that indigenous CPR regimes that are not self-organized, in which a significant portion of the institutional rules are designed by external actors, are unlikely to meet the eight design principles associated with durability.[5] This case suggests that a more effective role for donors in this situation would be to facilitate the capacity of the communities to self-organize, and to assist with the creation of an enabling environment, rather than to predetermine a specific management regime or extractive technology.

The general principle that emerges, then, is that CPR appropriators in more complex settings needing external assistance should seek to mimic as much as possible the development of self-organized, self-governing institutions. Fortunately, there are ways in which external actors can facilitate, rather than prescribe, the development of self-organized, self-governed appropriator organizations. Ostrom (1990), when analyzing a donor-initiated project in Sri Lanka, identified the process of change as being a key element; the external team "chose to facilitate the problem-solving capabilities of local farmers and officials," (p. 172) rather than imposing an institution. Development literature provides further evidence for the value of a more "enabling" approach to participatory development, in which donor organizations support the provision, training and support of internal change agents (Burkey, 1993).

Northern donor agencies, however, particularly bilateral donors such as USAID, have not traditionally channeled aid directly to local resource "appropriators." Rather, "development assistance is treated as something that, in its standard mode, takes place 'government to government'" (Murray, 1986, p. 197). While this trend has been modified somewhat by increasing levels of donor assistance to both Northern and Southern NGOs (Meyer, 1992), Northern donors remain much more likely to fund large-scale government-sponsored projects than they are to directly support local organizations. Moreover, as we have seen with the PEPP project, national government projects are not often interested in facilitating the self-organization of resource user groups; they are much more likely to support large-scale resource use schemes that will channel revenue to the state. As support to grassroots organizations, or NGOs that work at the grassroots level, becomes a more common and acceptable way to channel bilateral aid, the ability of donors to more effectively support the development of CPR appropriator organizations will be enhanced.

Acknowledging that external involvement is an inherently difficult and imprecise process, we now return to the CPR literature for guidelines for external change agents seeking to assist with the development of institutions for collective action. In addition to developing design principles for durable common-pool resource regimes, Ostrom (1992) has discussed variables that are associated with the emergence of self-organized CPR regimes (see Table 2). Some of these variables, small boundaries and few appropriators, for example, would be difficult for external agents to change. A number of these variables, however, can and have been influenced by outside agents interested in promoting sustainable resource management. Based on COFYAL, four variables that seem particularly open to positive external influence are: "asset structure" (*B2*), "existing organization" (*C4*), "ownership status" (*C5*), and "degree of centralization" (*C6*). A brief analysis of these four variables could help to clarify the potential role of external actors as enabling agents.

(a) *Asset structure*

A group of appropriators is more likely to develop a CPR institution if they are confident that the benefits to be gained from collective action are greater than the opportunity costs and the social and economic costs of organizing. Thus, external agents could seek to help reduce the costs and increase the benefits of self-organizing. The experience of COFYAL indicates that for the regime to be durable, the perceived cost/benefit ratio must be advantageous over the long run, not just in the start-up phase.

Ostrom (1992, p. 300) argues that heavy dependence of the appropriators on the resource can affect the benefit/cost relationship associated with developing an appropriator organization. With a less direct dependence on the resource, appropriators have less incentive to invest in communal management regimes — benefits would be less likely to exceed transaction costs. The four communities of Yanesha whose forests were to be managed by COFYAL did not depend directly on the forest resources for subsistence. One way in which external agents could increase the benefits of collective action would be to help the community gain access to value-added approaches to extraction, which was, in fact, a strategy taken by the CSRM project. The Yanesha "were aware that they sold the trees for too little and that the loggers were taking them and that they could make more money if they could saw them up themselves" (Stocks, personal communication). The promise of greater benefits, combined with the project subsidy of the high capital transformation costs, was successful in creating high enough benefits and low enough costs to get the Yanesha communities to invest in designing and developing a communal forest management institution.

Unfortunately, the initially high benefit/cost ratio of COFYAL changed over time because of both high social transaction costs and the failure of the coop to generate expected profits. The lesson from COFYAL for other donors may be that getting the benefit/cost ratio to a level that will foster the emergence of a CPR organization may indeed facilitate the institution's development, however, if that ratio changes over time, the institution may not be able to endure. Two things may be important to consider here: whether expectations of the benefits from collective management are realistic; and whether the appropriators will be able to sustain the social costs of maintaining the institution.

Table 2. *Variables associated with the emergence of appropriator organizations*

A. Variables related to the resource
1. *Size*. The boundaries of the CPR are sufficiently small, given the transportation and communication technology available, that appropriators can develop accurate knowledge of external boundaries and internal microenvironments.
2. *Clear-cut boundaries*. The boundaries of the CPR are sufficiently distinct that appropriators can develop accurate knowledge of external boundaries.
2. *Indicators of CPR conditions*. Reliable indicators of the condition of the CPR can be obtained as a result of regular use.

B. Variables related to the relationship between demand and supply
1. *Scarcity*. The amount of resource-units extracted from the CPR is sufficiently high that users are aware that their withdrawal patterns are interdependent.
2. *Asset structure*. The legal claims that some members of a group can sustain are sufficiently large that they are motivated to pay a major share of the initial organizational costs of creating or restructuring an organization.

C. Variables related to the appropriators
1. *Size*. The number of appropriators is sufficiently small that the costs of communication and decision making are relatively low.
2. *Residence*. Appropriators permanently reside near or "in" the CPR.
3. *Degree of homogeneity*. Appropriators are not strongly divided by:
   (a) natural boundaries
   (b) different, conflictual use patterns
   (c) different perceptions of the risks of long-term extraction from the CPR
   (d) cultural antagonisms
   (e) substantially different exposures to risk (as upstream differ from downstream users).
4. *Existing organization*. The appropriators have some prior experience with at least minimal levels of organization through:
   (a) the presence of a general purpose organizational structure, such as a village council or a cooperative organization
   (b) the presence of a specialized organizational structure related to this resource without prior management responsibilities, such as a boating club
   (c) the presence of nearby organizations that have helped others to solve similar CPR management problems.
5. *Ownership status*. The rights that appropriators have to access, use, and potentially, to the exclusive of others, are sustainable and certain.
6. *Degree of centralization*. The appropriators are not prevented from exercising local initiative by a centralized government.

Source: Ostrom (1992), p. 299.

(b) *Appropriators have some prior experience with cooperative association*

The emergence of an appropriator organization is more likely when "the appropriators have some prior experience with at least minimal levels of organization" (Ostrom, 1992, p. 299) through village associations or organizations specifically related to the CPR. The only multi-community structure among the Yanesha when COFYAL was developed was FECONAYA, which was not capable of organizing communal management of resources (Stocks, personal communication). Within the 11 communities in the project area, the Yanesha had no tradition of cooperation on economic issues or management of resources above the level of kin-based groups. Thus, the structure of COFYAL was "totally alien" to the Yanesha (Stocks, personal communication). Many other indigenous communities, as well as most recently, colonized areas in Latin American tropical forests, face similar constraints to organize — little if any history of working together to resolve CPR dilemmas, and often times little history of any form of economic or political organization (Forster and Stanfield, 1994).

If a self-organized appropriator organization is more likely to emerge when some organizational structures are already in place, the change agent approach could be used to facilitate social interaction and the development of general organizational structures, as was done in Gal Oya, Sri Lanka, before a community attempts to develop an appropriator organization. By focusing on building trust and reciprocity before addressing the CPR issue, change agents in Gal Oya were able to facilitate the development of social organization that made the emergence of a self-organizing institution possible (Ostrom, 1990).

Resource use rules must be clearly defined, and appropriators must be able to anticipate the behavior of others, for a CPR regime to be durable (Ostrom, 1990). The Yanesha are similar to other indigenous Amazonian groups in that there exists a high level of confusion and ambiguity over resource use rights — partially as a result of their attempt to integrate the traditional gift-based economy with market interactions (Smith, 1995). Smith suggests that donors should begin by working with the domestic unit that is the basis of economic activity for these groups.

> As the economic units grow more successful at managing their collective enterprises, the possibilities may open up either to integrate these into a single larger enterprise, or to develop greater complementarity and specialization so that while each economic unit/enterprise maintains its autonomy, it fulfils an important function within a broader economic process (Smith, 1995, p. 22).

Thus, change agents may need to begin at the domestic level and slowly help these units, if appropriate, merge to form community level relationships that may eventually lead to a CPR institution.

(c) *Ownership status*

The Yanesha communities' desire to develop a better resource management system came out of both an understanding of the impact of their own actions, and also the recognition that the resource was under threat from external actors. Facing internal and external threats to the resource, it is reasonable to assume that appropriators would only decide to invest in a CPR institution if they felt that it would address those problems. In COFYAL's situation, it was therefore critical that the project helped to secure the resource for the Yanesha, which it did by requiring that the lands were titled. Again, however, this action seemed to be sufficient to get the organization started, but not to keep it going. Threats from outsiders — colonists, Shining Path guerrillas, road crews — continued to plague the Yanesha, even after they had official title of their lands. As discussed in our analysis of Design Principle 1, the defensibility, or secure tenure, of the resource could not be guaranteed through titling alone. Securing the resource of the appropriators is a need that external change agents may be able to address in some situations but not in others. In the case of COFYAL, suppressing the guerrilla activity in the Palcazu Valley was certainly not a strategy that a USAID-funded project could pursue. External organizations should seek to facilitate secure resource tenure for the appropriators to the extent possible. If secure tenure does not seem to be feasible, however, a CPR institution may not be the best way to manage the resource. If the resource can be destroyed by outsiders, independent of the actions of the appropriators, high discount rates will result (Ostrom, 1990, p. 35), which will likely lead to overuse of the resource.

(d) *Degree of centralization*

As we pointed out in our discussions of Design Principles 7 and 8, there are a host of factors that can influence appropriators' ability to exercise local initiative. Although it is unlikely that, in the absence of USAID involvement, the Yanesha would have been prevented from organizing outright, given the political economy of the region, and the attitude of PEPP personnel, it is equally unlikely that the Yanesha would have been able to exercise local initiative in any meaningful way. USAID pressure, influenced by the loud voices of a number of international indigenous rights and environmental groups, resulted in 14 Yanesha communities receiving land title, clearly helping to redirect the priorities of the government toward fostering local initiative, at least temporarily. International support from nongovernmental organizations or bilateral or multilateral donors can also help local groups organize by applying pressure to governmental authorities to grant tenure and political rights to these groups.

4. CONCLUSION

This analysis suggests that CPR design principles should be explored in greater depth and expanded if they are to be prescriptive for complex donor-supported community resources management projects in the developing world. This case, along with the experiences of other community forestry enterprises in Latin America, suggests that donor-driven projects often fail to analyze in sufficient depth the factors outlined by the design principles, particularly the issues of institutional and technological appropriateness and the impact of the larger political economy. The experience of COFYAL also supports the argument that external assistance can aid in the development of self-organized, self-governing appropriator organizations, provided the design principles given in Table 1 are attended to and that the assisting individuals or organizations assume a facilitator role that ensures self-organization of the CPR institution, rather than imposing a precrafted system from without. We recognize that meeting these conditions is extremely difficult, however, and may not prove to be sufficient, in some situations, even if met.

The recommendations above are based on a single case study analyzed within the framework of design principles and variables for CPR institutional development and management that are preliminary. In addition, there are some potentially relevant topics which the CPR literature fails to address or which we felt to be beyond the scope of this paper.[6] Further research is needed to test these expended principles and to help determine appropriate areas and mechanisms of intervention for external actors.

NOTES

1. From Ostrom (1990, 1992).

2. The involvement of foreign interests in the CSRM project may have also contributed to a feeling of insecurity among the Yanesha about the future of their forests. Development planners in Haiti found that "the fear of expropriation [of reforestation project trees] is particularly frequent when foreigners are leading the tree-planting effort" (Murray, 1986, p. 203).

3. One forestry advisor, however, has questioned the viability of a communal forest management scheme altogether, given the climatic and topographic constraints of the Palcazu Valley (Simeone, personal communication).

4. In addition, the minimal transformation costs incurred by the Yanesha as a result of project subsidization also helped undermine the "ownership" element of institutional membership. The forestry component of the Central Selva Project had an initial budget allocation of over five million dollars (loan of $4,895,000 and grant of $910,000) (USAID, 1982). COFYAL was fully funded by the project — all equipment, all technical assistance and ongoing subsidization was provided by project funds. The communities did not have any motivation to "own" the coop or to put in any extra effort as long as external agents were paying the bills and salaries. As a result, the Yanesha, especially those not involved in the coop, viewed COFYAL as a part of the project, not as "theirs" (Pariona, personal communication).

5. The experience of COFYAL suggests it is particularly difficult to meet expanded design principles two and eight and Ostrom's Design Principles 3 and 6 (see Table 1).

6. For example, one factor not addressed by any of the principles above is that of the "substitutability" of the resource. Contact with outsiders has resulted in the development of a need for cash to purchase items such as kerosene, clothing, radios, and machetes (CASA, 1994 cited in Benavides and Pariona, 1995). Because they do not need the forest products, but rather the cash they generate, this resource may be substituted for a higher value cash crop. A project study demonstrated that the strip shelterwood method was projected to be slightly less profitable than would be arabica coffee production (Hartshorn and Pariona, 1993), and the communities are well aware that they could earn a great deal more from coca production if they cleared the forest (Simeone, personal communication). The CPR framework used to analyze this case does not address this important issue.

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