

DEVOLUTION AND FISHERIES CO-MANAGEMENT

Robert S. Pomeroy¹

INTRODUCTION

Global-scale changes in the supply, demand, value, management and uses of fisheries resources could threaten progress towards sustainable food security in many parts of the developing world, but they could also stimulate improved management and use of the resources. In many developing countries, population pressure and limited alternative employment opportunities, together with the inability and reluctance of governments to take the necessary conservation and management decisions, have resulted in severely overfished coastal and inland resources and increased threats to the livelihoods of fishers.

A decrease in global fish production in the early 1990s brought about by overfishing and environmental degradation (pollution, habitat loss, coastal development) generated calls for improved management strategies and sustainable use of aquatic resource systems. Decision-makers and resource managers are searching for better ways of managing all fisheries, including the small-scale fisheries.

Despite intense fishing pressure and a decline in productivity, small-scale fisheries in the inland, estuarine and near-shore areas still play an important role in local food security in developing countries. They provide food, income and employment. In most societies, small-scale fishers are particularly hit by the problem of shrinking resource base as they have low social status, low incomes, poor living conditions and little political influence. They frequently compete for resource access with larger-scale fishers and other sectors of the economy. It is important to remember that small-scale fisheries are embedded in larger aquatic resource, social, economic and political systems and many of the solutions to improving standard of living lie outside the fisheries sector. The resources on which these people depend are still largely natural fish populations.

It is estimated that at least 50 million people in developing countries are directly involved in the harvesting, processing and marketing of fish and other aquatic products and worldwide fish production provides some 150 million people with employment. Approximately 1 billion people rely on fish as a major source of their food, income and/or livelihood (ICLARM 1999). The combined effects of increasing population growth and stabilization of fish supplies has led to a decline in the per capita availability of fish supplies for human consumption, while prices have continued to rise due to a widening gap between supply and demand. Capture fish production has not been able to keep pace with the demand for fish. Production of fish by capture fisheries reached its upper limits in 1989 and began a decline thereafter.

¹ Robert Pomeroy is Senior Associate for the Coastal and Marine Projects, Biological Resources Program at the World Resources Institute.

The United Nations Food and Agriculture Organization estimates that almost 70 percent of fish stocks for which data are available are fully exploited, overfished, or otherwise in urgent need of management (Garcia and Newton 1994). The world fishing fleet reflects an overcapacity of about 30-40 percent. Looming shortfalls have been compensated, though not adequately, by better than expected increases in aquaculture production, which now contributes roughly 20 percent of the total world production of fish.

Approximately 70 percent of the world production of food fish is now caught or produced in developing countries. In these countries the average per caput consumption of fish (9 kg) is about one-third of that in developed countries (27 kg), developed countries being net importers of food fish. Approximately 40 percent of the world's fish production is traded internationally (ICLARM 1999). Increasing international trade in fishery products is raising questions about the supply of food fish for poorer people in developing countries.

It has been predicted that natural stocks will likely be below current levels in the year 2020 or at best maintain their present levels. To prevent further depletion of fisheries resources, improved management is needed. Many current management arrangements have failed to coordinate and restrain the many users of fisheries resources. They have not kept pace with the technological ability to exploit the resource or with the driving incentives to exploit—economic returns, population growth, food, and employment. Management systems have focused on fisheries development and resource management, but have failed to address the issues of economic efficiency, equity and user conflict (Williams 1996). Increasing competition for and conflict over scarce resources will further stress fisheries management systems.

In the last decade approaches for management and governance of fisheries resources have undergone a significant transition. There has been a shift from traditional production and stock- and species-based management toward conservation and ecosystem based management. Privatization, rights-based management, community-based management and co-management are in some cases replacing open-access and centralized government management systems. It is increasingly recognized that resources can be better managed when fishers and other stakeholders are directly involved in management of the resources and use rights are allocated—either individually or collectively. Devolution of management authority and responsibility is bringing about shifts in local power elites and structures. These new approaches will require changes in the administrative levels of management and new laws and policies.

The purpose of this paper is to discuss the critical role of devolution in the strategy of fisheries co-management. Following this introductory section, the paper discusses the search and need for better fisheries management methods. An alternative management approach, fisheries co-management, will then be defined and analyzed in detail in section three. Two crucial issues in the discussion of co-management arrangements are property rights and collective action. Section four presents some

examples of co-management from Asia and the Caribbean. The establishment of conditions for co-management by governments will be discussed in the fifth section. Section six focuses on decentralization and co-management. The final section of the paper summarizes the opportunities and problems inherent in a program of devolution and co-management.

THE SEARCH FOR BETTER MANAGEMENT METHODS

Historically in most developing countries under colonial rule governance of coastal and marine resources was transferred from communities to local and national government bodies (Pomeroy 1995). In most colonies, centralized management agencies were established. They controlled the level of exploitation, modernized fishing methods, and ensured exports back to the colonial country. The centralized approach to management, which began centuries ago in some countries, continued under the neo-colonial regimes of newly independent nations as they consolidate power.

In the last 50 years shifting philosophies have affected the fisheries development process. The period after World War II was one of reconstruction of the world's fishing fleets. The 1960s witnessed the expansion of fishing activities with the opening up of new fishing grounds, new technologies and long-range fleets. During the 1970s, the expansion continued, but at the same time the recognition of resource depletion and the need for equity entered the debate. In the early 1980s, the United Nations Conference on the Law of the Sea extended the exclusive economic zones (EEZ) of coastal countries. This expansion entailed a redistribution of access to ocean resources and of use-rights. Throughout the 1980s and early 1990s, there was growing concern globally about resource overexploitation and environmental degradation, threats to biodiversity, and a call for sustainable development. In the 1990s several international initiatives including the UN Conference on Environment and Development, the International Convention of Biological Diversity, and the Code of Conduct for Responsible Fisheries challenged countries to encompass sustainable utilization of fisheries resources (Garcia 1994). One central element of these initiatives is the enhancement of users participation, going beyond of mere consultation and top-down information provision to participatory decision-making and interactive management.

Initially among Western-trained fisheries managers, the management of fisheries resources had long been based on the conventional wisdom that it is possible to manage fisheries successfully if three facts are kept in mind: (1) when left on their own fishers will overexploit stocks; (2) stocks are extremely unpredictable; and (3) to avoid disaster, managers must have effective hegemony over fishers (Berkes 1994). The centralized management approach has been dominated by the assumption that any fishery is characterized by open access features and intense pressure on the resource will eventually lead to overexploitation and the eventual dissipation of resource rents. This situation has been described as the "tragedy of the commons". This centralized approach overlooks traditional and customary knowledge and management systems in the belief that the state is the best guardian of society's interests. As a consequence tight government controls regulate fisheries. Over time these controls have become both complicated and costly.

In many instances, the national government has overestimated its ability to manage centrally fisheries resources. When existing community-level institutional arrangements for coastal fisheries management are undermined, as in the process of centralization or nationalization, the usual common-property resource management regimes have been replaced, in many cases, by open access regimes.

Given the often disappointing results of centralized natural resource management, this approach has been consequently criticized and has been considered as a primary cause for the overexploitation of fisheries resources, although in reality the fishers should share the blame with the managers and scientists. Professionals have replaced the resource users as resource managers. The fishers have done little to monitor and enforce themselves. The centralized management approach involves little effective consultation with the resource users and is often not suited to developing countries with limited financial means and expertise to manage fisheries resources in widely dispersed fishing grounds.

In the last decade, following concern for fisheries overexploitation and environmental degradation, there have been changes in the objectives and policies of fishery management systems. The objectives have shifted from maximizing annual catches and employment, sustaining stocks and short-term interests, to maximizing long-term welfare, sustaining ecosystems and addressing both short- and long-term interests. Policy changes have shifted from open and free access, sectoral fishery policy, command and control instruments, and top-down and risk prone approaches to limited entry, user rights and user fees, coastal zone intersectoral policy, macro-economic instruments, and participatory and precautionary approaches (Garcia 1994).

Especially command and control systems (the use of various harvest control regulations) are considered by many as outdated and inadequate to tackle the increasing problems of fisheries. In response to the failures of centralized fisheries management approaches, researchers, policymakers, as well as fisher communities themselves are developing a variety of alternative approaches to fill the management gap.

These approaches are meant to deal with the perverse economic incentive system which arises largely from environmental as well as economic externalities, the last often ascribed to ill-defined property rights (Munro, Bingham, and Pikitch 1998). These strategies range from community-based management and co-management, meant to address the lack of participation and reduce conflicts that were the legacy of centralized management, to rights-based management and limited or controlled access techniques, which are meant to reduce excess competition, stimulate investment and provide incentives for greater economic efficiency. The first two approaches focus on the establishment of common property regimes, while the latter approaches, rather than focusing on allocating fishing areas to users, grant right of access, but not ownership, by the state, to a share of total allowable catch.

It is interesting to note that while for fisheries resources, government controls have been tightening in the recent past, in the case of other natural resources management had

been moving faster in the direction of devolution, deregulation, decentralization and co-management (Berkes 1994). This slowness in moving in new directions may be due in part to the complexity of natural and human ecosystems which exist in marine and coastal environments.

Fisheries management experts increasingly recognize that the underlying causes of fisheries resource overexploitation and environmental degradation relate to the social, economic, and institutional as well as political sphere. From an economic perspective, the causes of overfishing are generally found in the absence of well-defined property rights or other institutions that might provide exclusive control over harvesting, giving the user a long-term time horizon and providing incentives for sustainable use and conservation.

Over time fisheries managers and researchers also began to recognize that a fishery cannot be effectively managed without the cooperation of fishers and other stakeholders to make laws and regulations work. In most countries, the fishery sector is regulated by a great number of laws, rules and norms, many of which are quite specific and well intentioned. However, the effective capacity of many fisheries agencies to monitor what goes on in widely scattered, often isolated fishing grounds is distinctly limited. Without denying that the traditional community-based systems of fisheries management can sometimes be inequitable as well as ineffective, state interventions that have chosen to ignore them have seldom fared better. The promotion of nationalization and privatization as routine policy solutions has not solved the problem of resource overexploitation and, in many instances, has deprived large portions of the population of their livelihood (Bromley and Cernea 1989). Under these conditions, the devolution of fisheries management and allocation decisions to the local fisher and community level may be more effective than the management efforts which distant, understaffed and underfunded national government fisheries agencies can provide.

The conventional wisdom that fisheries resources which are held as communal property are subject to eventual overexploitation and degradation and that centralized management authority is needed to manage resources is challenged by a number of empirical studies (Pinkerton 1989; Jentoft 1989). Recent investigations on community-based fisheries management systems have shown that when left to their own devices, communities of fishers, under certain conditions, may use fisheries resources sustainably, efficiently and equitably (Pinkerton 1989; Pomeroy 1995).

Fishers, the real day-to-day managers, must be equal and active participants in resource management. An open dialogue must be maintained between all the stakeholders in resource management. Property rights to the resource must be assigned directly to its stakeholders—the coastal communities and resource users. A new management philosophy is warranted in which the fisher can once again become an active member of the resource management team, balancing rights and responsibilities, and working in a cooperative (rather than antagonistic) mode with the government.

In our view the primary concern of fisheries management, therefore, should address the relationship of fisheries resources to human welfare; and the conservation of the resources for use by future generations. That is, the main focus of fisheries management

should be people, not fish, per se. Policy interventions, if they are to bring about lasting solutions, must address these concerns.

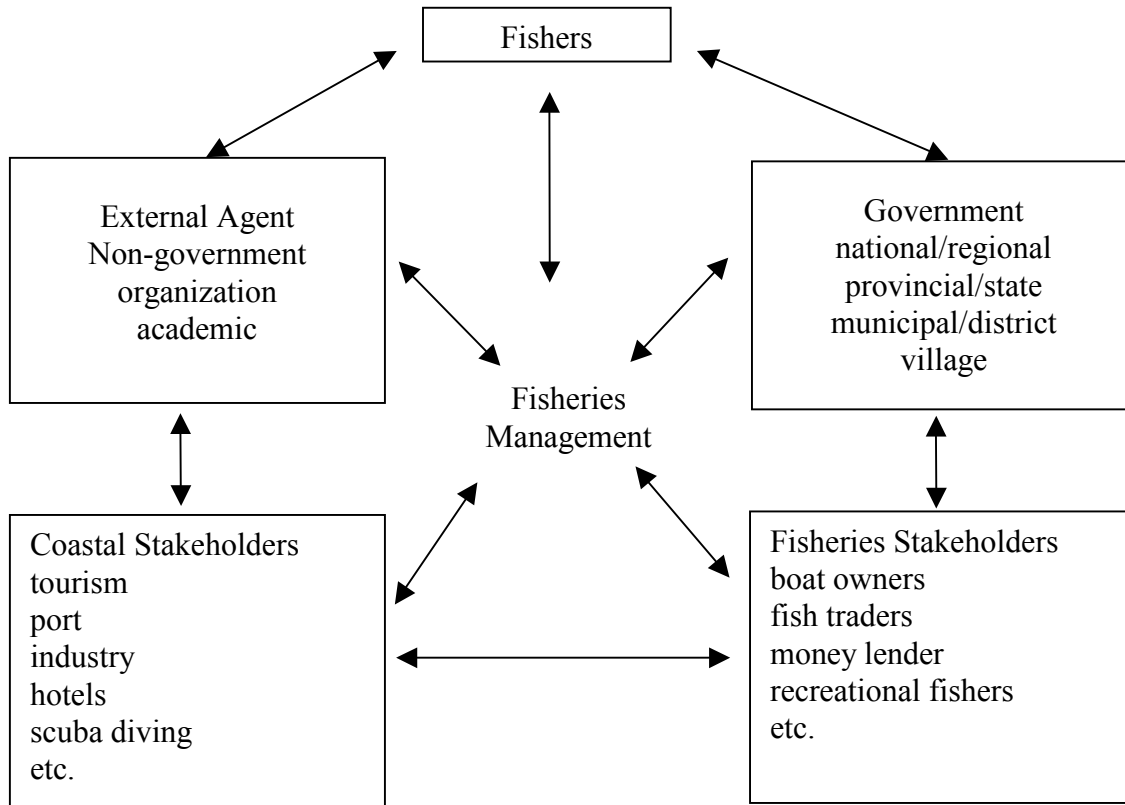
FISHERIES CO-MANAGEMENT

Fisheries co-management can be defined as a partnership arrangement in which government, the community of local resource users (fishers), external agents (non-governmental organizations, academic and research institutions), and other fisheries and coastal resource stakeholders (boat owners, fish traders, money lenders, tourism establishments, etc.) share the responsibility and authority for decision making over the management of a fishery (Figure 1).

In contrast to the often ineffective historical record of centralized fisheries management, co-management is intended to be a more dynamic partnership using the capacities and interests of the local fishers and community, complemented by the ability of the state to provide enabling legislation, enforcement and other assistance (Jentoft 1989; Pinkerton 1989; Berkes, George and Preston 1991; Berkes 1994). Such “co-management” includes shared governance structures between stakeholders in the resource and institutions of local collective governance of common property.

Co-management covers various partnership arrangements and degrees of power sharing and integration of local (informal, traditional, customary) and centralized government management systems. There is a hierarchy of co-management arrangements (Figure 2) from those in which the fishers are consulted by the government before regulations are introduced to those in which the fishers design, implement and enforce laws and regulations with advice from the government (Sen and Raakjaer-Nielsen 1996). Co-management entails a conscious and official distribution of responsibility, and the formal vesting of some authority. The stakeholders develop an agreement which specifies their respective rules, responsibilities and rights in

Figure 1: Fisheries co-management is a partnership

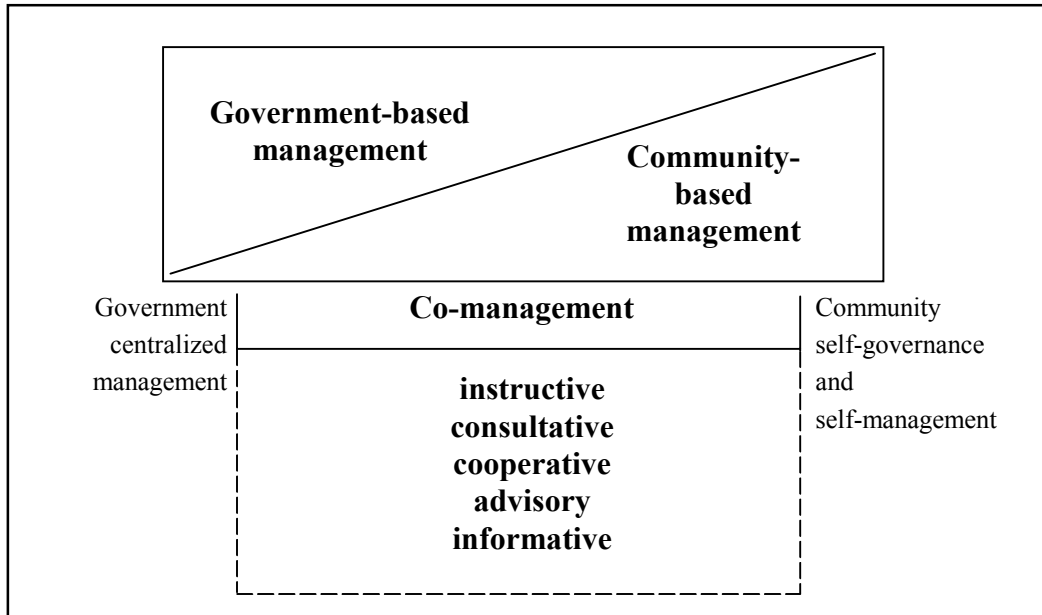


management. The amount of responsibility and/or authority held by the state or devolved to local institutions will differ depending upon country and site-specific conditions. Determining what kind and how much responsibility and/or authority should be allocated to the local levels is a political decision.

Needs and demands within the small-scale fisheries sector also differ across regions and no single management solution can be appropriate for all cases. Thus co-management should be seen as a process of resource management, adjusting and maturing to changing conditions over time and involving aspects of decentralization, social empowerment, power sharing and democratization. Co-management is not a regulatory technique but a flexible management strategy in which a forum or structure for action on participation, rule making, conflict management, power sharing, leadership, dialogue, decision-making, knowledge generation and sharing, learning, and development among resource users, stakeholders and government is provided and maintained. Partnerships are pursued, strengthened and redefined at different times during the co-management process depending on the existing policy and legal environment, the political support of government for community-based actions and initiatives, and the capacities of community organizations to become government partners. The co-management process may include the formation or recognition of

formal and/or informal organizations of resource users and stakeholders. This is one of the reasons why the establishment and successful operation of fisheries co-management can be a complex, costly and multiyear effort (Rivera 1997; Pomeroy et al. 1999).

Figure 2. A hierarchy of co-management arrangements (after Berkes 1994)



Co-management involves various degrees of delegation of management responsibility and authority between the local-level (resource user, stakeholder, community) and the state-level (national, provincial, municipal, village government). Co-management is a middle course between state-level concerns in fisheries management for efficiency and equity, and local-level concerns for self-governance, self-regulation and active participation. Co-management can serve as a mechanism for both fisheries management and for community and economic development by promoting participation of fishers and the community in actively solving problems and addressing needs and in social development.

A central part of co-management is a formal agreement between two or more parties. The agreement typically describes the objective to be achieved by the co-management arrangement, the parties to the agreement, and defines the rights, authorities and responsibilities of all the parties. The agreements should be flexible to adjust to changing needs and maturity of the arrangements.

In some cases, co-management may be simply a formal recognition of informal and customary community-based system of fisheries management which already exists. The theme of co-management is that self-involvement in the management of the

resource will lead to a stronger commitment to comply with the management strategy and sustainable resource use.

Co-management also provides for local collective governance of common property. Capture fisheries resources are common pool resources. As a class, they have two characteristics: (a) the difficulty of exclusion, that is control of access to the resource; and (b) subtractability, that is, extraction of the resource by one user detracts from the availability to others. Solutions to the commons problem necessarily involve some form of access control and some form of institutional design (rules) to regulate use and to minimize the problem of subtractability. With the allocation of property rights both the costs and benefits of any management action will be borne by the same individual or group, providing incentives to conserve. If it is not possible to vest property rights to capture fisheries resources on an individual basis, it is possible to establish common property regimes and to vest property rights in a specific group of people on a collective basis.

The four property rights regimes (Bromley 1992): state property, communal property, private property and open access, are ideal, analytical types; they do not exist in the real world. Rather, resources tend to be held in overlapping combinations of these four regimes. Co-management is a governance arrangement between pure state property and pure communal property regimes. Strictly speaking, pure communal property systems are always embedded in state institutional systems. It should be noted, however, that while state law can reinforce or strengthen communal property, it might not always do so. Community-based resource management (CBRM) is a central element of co-management. The advantages of CBRM systems have been well-documented in various parts of the world. The better known of these initiatives have been in irrigation and social forestry but similar approaches are being applied in upland agriculture and wildlife. Community-based fisheries management (CBFM) tends to be more difficult due to the complexity of fisheries and aquatic resource systems, the social and cultural structures of fishing communities, and the independent nature of fishers.

While there are many similarities between the concepts of co-management and CBRM, there are differences in the focus of each strategy. These differences center on the level of participation of government and the stage in which the government becomes involved in the process. CBRM is people-centered and community-focused, while co-management focuses more on a partnership arrangement between government, resource users, and the local community. There is also a difference in the way the process of resource management is organized, with co-management having a broader scope and scale than CBRM. Co-management includes a major and active role for the government. Government serves a number of important functions including provision of supporting policies and legislation such as decentralization of management power and authority, the fostering of participation and dialogue, legitimization of community rights, initiatives and interventions, enforcement, addressing problems beyond the scope of the community, coordination at various levels, and financial and technical assistance, among others. Government provides legitimacy and accountability to CBRM through

co-management. Government must establish commensurate rights and conditions and devolve some of their own powers for both co-management and CBRM to be effective resource management strategies. Only government can legally establish and defend user rights and security of tenure at the community level. Co-management often addresses issues beyond the community level, at regional and national levels, and of multiple stakeholders, and allows these issues to be brought more effectively into the domain of the community. CBRM practitioners sometimes view government in an external role which is only brought into the project at a later stage or as needed. This often leads to misunderstandings and lack of full support from the government. Co-management strategies involve government agencies and resource managers as well as the community and stakeholders from the very beginning. This way, trust among participants is more likely to arise. Based on the above discussion on co-management and CBRM and on the literature on co-management, it is possible to develop two categories of co-management: (1) community-centered co-management and (2) stakeholder-centered co-management.

When CBRM is considered an integral part of co-management, it can be called community-centered co-management. Community-based co-management includes both the characteristics of CBRM and co-management, i.e., people-centered, community-oriented, resource-based, and partnership-based. Thus community-centered co-management has the community as its focus, but recognizes that to sustain such action, a horizontal and vertical link is necessary. Successful co-management and meaningful partnerships can only occur when the community is empowered and organized. This category of co-management will be more complex, costly and time-consuming to implement than just CBRM due to the need to develop partnerships early in the process and to maintain them over time. Examples of community-centered co-management can be seen in countries all over the world including Asia (Pomeroy and Pido 1995; Pomeroy 1995), Africa (Normann et al. 1998), and the Caribbean (Brown and Pomeroy 1999). Community-centered co-management seems to be more common in developing countries due to the need for overall community and economic development and social empowerment and not just resource management.

A variation of community-centered co-management can be called traditional or customary co-management. Traditional or customary community-based management systems are or were utilized to manage coastal fisheries in various countries around the world. Existing examples in Asia and the Pacific have been documented over a wide discontinuous geographical range (Ruddle 1994). Many of these systems play a valuable role in fisheries management and have a future usefulness both locally and nationally. Ruddle (1994) points out that,

In many locations, legal issues are among the principal constraints on the viability or future usefulness of traditional marine management systems. Thus, if the

contemporary usefulness of such systems has been formally recognized by government, they will require support by appropriate amendments to national laws, and lower order governments, such as provinces/states, with the explicit and easily understood recognition of customary law and community-based management rights as local corporate entities, accompanied by procedures for establishing the recognition of these rights.

Traditional or customary co-management is a formal government recognition of the informal system. Co-management can serve as a mechanism to legally recognize and protect these traditional and customary systems and to specify authority and responsibility between the community and government. Thus, traditional or customary co-management is a formal and legal recognition by government of these local systems and a definition of shared powers and authority.

Stakeholder-centered co-management can best be characterized as government-industry partnership through involvement of user groups in making resource management decisions. The focus of this category of co-management is representation of fishers and other stakeholders through various organizational arrangements in management. Unlike community-centered co-management, there is little or no attention given to broader issues of community development and social empowerment of fishers. Examples of stakeholder-centered co-management can be seen in many developed countries in Europe and North America (Jentoft and McCay 1995; Nielsen and Vedsmand 1995; Hanna 1995; McCay and Jentoft 1996). Stakeholder-centered co-management seems to be more common in developed countries where the emphasis is to get the resource users participating in the resource management process.

The potential advantages of co-management include efficiency and equity. Co-management can be more economical in terms of administration and enforcement than centralized systems. It involves self-management where the fishers take responsibility for a number of managerial functions. It allows the community to develop a management strategy which meets its own particular needs and conditions and is more legitimate in their eyes. Fishers or local communities are able to devise and administer regulatory instruments that are more appropriate to local conditions than externally imposed regulations. This form of self-management provides the fishers with a sense of ownership over the resource it gives them a powerful incentive not to heavily discount future returns from the fishery resource and thus to view the resource as a long term asset. Fishers are given an incentive to respect and support the rules because they complement cultural values, are self-imposed, and because they are seen as individually and mutually beneficial. Since the community is involved in the formulation and implementation of management measures, a higher degree of acceptability and compliance can be expected. Co-management makes maximum use of indigenous knowledge and expertise to provide information on the resource base and to complement scientific information for management. Its strategies can minimize social conflict and maintain or improve social cohesion in the community.

Co-management may not be suitable for every fishing community. Many communities may not be willing to or capable of taking on the responsibility of co-management. A long history of dependency on government may take years to reverse. Leadership may not be available within the community to initiate or sustain the co-management efforts. For many individuals and communities, the incentive(s)—economic, social and/or political—to engage in co-management may not be present. The risk involved in changing fisheries management strategies may be too high for some communities and fishers. The costs for individuals to participate in co-management strategies (time, money) may outweigh the expected benefits. Sufficient political will may not exist among the local resource stakeholders or in the government to actually manage the fisheries in a responsible and sustainable manner. Actions by user groups outside the immediate community may undermine or destroy the management activities undertaken by the community. Particular resource characteristics, such as fish migratory patterns, may not make it possible for the community to manage the resource. There is no guarantee that a local community will organize itself into an effective governing institution.

The delegation of significant authority to manage the fisheries may be one of the most difficult tasks in establishing co-management systems. While governments may be willing to call for more community involvement, they must also establish commensurate rights and authorities and devolve some of their own powers. The issue of devolution will be addressed in detail in a subsequent section of the paper.

PROPERTY RIGHTS IN FISHERIES CO-MANAGEMENT

At the root of co-management is the issue of property rights. As mentioned earlier, co-management addresses institutions of local governance of common property. Property rights play a central role in the management of fisheries resources. Property rights provide authority and shape the incentives for resource users to invest in management and conserve the resource. Before examining the role of property rights in current co-management and community-based management arrangements, it is important to understand the role of property rights in traditional community-based fisheries management systems. These systems have mechanisms of collective decision-making, conflict management and regulation, and specify fishing rights and tenurial relationships of small-scale fishers to the resource (Ruddle 1994). While many of these systems have been weakened or disappeared due partly to institutional restructuring under colonial administrations, technological modernization, the rise of the nation-state, incursion from outsiders into the community, socio-economic stratification and concentration of power and wealth within coastal communities, a number have survived due to their ability to deal with allocation problems, to control access, and to enforce rules and sanctions.

Traditional management systems in the Asia-Pacific region are based on property rights and associated regimes which reflect local culture, economic conditions, and structures of power and social organization. Many of these systems seem not to be based primarily on conservation of the resource, although that is one objective, but on relationships between property and social organizations in the community. As Ruddle (1994) states, "In these traditional community-based systems of marine resource management an individual's sea rights depend on his or her social status within a corporate community, which ranges from villages through clans, sub-clans, and lineage, to the family. Resource territories and user groups are defined." Under these systems marine resources do not have the characteristics of open access, and coastal marine areas have property status comparable to that of common property regimes in which access to a territory is limited to a defined group.

The systems vary by area but resource control and management is usually vested in traditional authorities, such as secular leaders, religious leaders or specialists, which vary according to social organization. Rights to exploit fisheries are given to members of the fishing community as members of a social group. These rights may be exclusive, primary (entitled via inheritance), or secondary (more restrictive than primary). They may be granted to outsiders, may be transferable, and may be further classified into rights of occupation and use (Ruddle 1994).

Operational rules are specified to govern the systems, identify fishing areas, and define internal and external access. There are also rules to govern fishing behavior, gear usage and allocation issues, and conservation. Routine decision-making, the implementation and enforcement of decisions, monitoring of the fishery, and sanctions are undertaken by members of the local community. Four types of sanctions may be used including social, economic, supernatural, and physical punishment (Ruddle 1994).

The literature on fisheries in the Caribbean is replete with accounts of traditional systems predating colonialism. The characteristics of these systems include exclusive use rights (Berkes and Shaw 1986), boundary demarcations (O'Marde 1994), and self-regulatory mechanisms (Finlay 1993, 1995), conflict management mechanisms, rules governing resource allocation, and elements of equity (Wilkins 1983; Mitchell and Gold 1982).

The majority of coastal fisheries in developing countries are in effect de facto open access. While laws and regulations are on the books, the ability to enforce these laws and regulations is practically non-existent due to the fact that fisheries department and enforcement agencies do not have sufficient resources. In addition, the political will is often not in place to enforce these laws and regulations due to the influence of power elites. While in general the coastal fisheries resources can be considered to be open access, in some cases property rights exist. In many cases licenses are provided for the placement of fixed fishing gears such as fish corrals and of fish aggregating devices. This essentially privatizes an area for the individual owner of the fishing gear. Licenses are also provided to aquaculturists for the culture of various marine organisms as

seagrass on lines on the sea bottom, fish cages in the water column, clams on intertidal bottoms, and oysters on stakes in the intertidal zone.

Some relatively sedentary fish species can be managed by controlling parts of the water bottom and column. For these species, regulations restricting fishing opportunities resemble property rights used on adjacent terrestrial areas. The term 'territorial use rights in fisheries' (TURFs) describes this old and useful approach (Christy 1982).

The most elaborate modern system of property rights as a tool for managing marine fish populations evolved in Japan (Lim et al. 1995). While the historical roots for these programs go back to feudal times, a large and sophisticated bureaucracy evolved after the Second World War in order to manage the resources. The Japanese system places the stamp of national law on allocation decisions made at the local level, usually by a fishers' cooperative. While there have been many attempts to do so, the Japanese system is not easily transferred to other cultures.

Traditional community-based fisheries management systems make extensive use of customary property rights. For example, beach seine fishers in the Eastern Caribbean, especially in the islands of Grenada, St. Vincent and the Grenadines, St. Lucia and Dominica, have communal property rights systems for allocating fishing areas amongst themselves. Such systems of community-based management are strikingly similar among the islands. These self-regulating, sea-use management systems in most cases involve territorial use rights in fisheries (TURFs). The TURF may be defined as a system in which the community of beach seine users allocate the fishing opportunity at designated fishing sites on a time specific basis. The TURF system may be characterized as: site-specific in that the fishing opportunity is usable only at specific sites; gear-specific in that a single type of gear, either threaded or monofilament seine is allowed to operate in the TURF; time-specific in that either specific real time or specific time limiting conditions for use of the fishing opportunity are provided for; but species nonspecific in that no limit is placed on the type of fish species that may be harvested. Territoriality is largely recognized by the resource using communities, through a number of unwritten conventions, mores, norms and rules for allocating space, developed over time in situ (Brown and Pomeroy 1999).

These informal systems of resource use and management have evolved over the decades and demonstrate wide acceptance, legitimacy and effectiveness within individual communities. They clearly describe a package of community-based property rights, which are shaped by a number of factors, including physical conditions of the fishing zone (especially those maintaining territoriality), the nature of the target fish stock with its availability, abundance and species diversity, appropriate technology in terms of simplicity and optimal size, and socioeconomic and cultural dimensions of the community.

A concern among several researchers is that the revitalization of community-based management and co-management systems will undermine traditional, customary and informal systems of fisheries management which exist in a community. Often, new management systems are developed and implemented on “top” of these traditional, customary and informal systems without recognition of their existence and they are lost or their function is diminished. Project staff implementing new management systems will need to be educated on how to recognize and understand the operation of these systems so that they can be integrated in project plans and proposed management strategies. Many traditional systems are threatened by modernization, political decisions and integration into market economies. No tradition has ever been static, and change can occur without tradition being lost. Credible and well-functioning systems are resilient and can be integrated with a new system or strengthened through a co-management arrangement. A case in point is the *sasi* system in the Maluku Islands of eastern Indonesia. Based on traditional law, the *adat* regulations, *sasi* rules regulate the use of natural resources, both terrestrial and marine. Marine resources under *sasi laut* are subject to rules concerning the opening and closing of the fishery, fishing techniques, access rights, and division of the harvest. Acknowledgment and enforcement of the regulations is undertaken by local traditional leaders. The *sasi* system has disappeared in many areas, but in others it continues to be a functioning, equitable and efficient management strategy. There is action being taken to rebuild this institution in the form of co-management by formally legitimizing the system and devolving management authority to the local traditional leaders. Government would provide enforcement support when needed. The current political and economic problems in Indonesia have stalled this activity but interest still exists (Harkes 1999).

The specification, legitimization and enforcement of property rights have been one of the critical conditions for success of co-management and community-based management projects. A review of community-based management projects in the Philippines found that when user rights are specified and secure, there is a change in the behavior and attitude of the fisher towards conservation and a much greater chance that the material intervention of the project will be maintained. In addition, the review showed that government support through legislation, funding and enforcement is crucial to sustaining the intervention. In most cases, local property right institutions require active collaboration with government to enforce user rights (Pomeroy et al. 1996). In the Philippines, for example, early efforts in establishing marine reserves as part of the community-based management effort failed due in large part to the difficulties in obtaining government approval for local ordinances to establish and operate the reserves. Without the ordinance, the organized fishers were not able to legally defend their rights over the reserve from outsiders. At the time, all local ordinances had to be approved by the Secretary of Agriculture in Manila. It was not until the passage of the Local Government Code of 1991 that local ordinances could be approved at the municipal level. The Local Government Code allowed for more active collaboration of local governments with fisher organizations to enforce local user rights.

A concern in the establishment of common property regimes is how to decide who has the access right. It is often easy to identify the full-time fishers, but there are often large numbers of part-time or seasonal fishers who have traditionally had access to the fishery to supplement their income and food. Upland farmers, for example, may fish on a seasonal basis to feed their family. These are legitimate users and need to be included in the management process. In the case of inland water bodies in Bangladesh, for example, these part-time fishers were excluded from the management process. This caused a problem within the community. A compromise was reached where part-time fishers were given access to the water body to fish for family use only.

In the next sections several specific examples from Asia and the Caribbean will be used to illustrate the importance of property rights.

THE SOUFRIERE MARINE MANAGEMENT AREA PROJECT, ST. LUCIA

Economic expansion and diversification on a national scale generated a spillover effect in a sub-region of St. Lucia, whose simple economy was hitherto based particularly on artisan fishing. The Soufriere coastal region in the southwest of the country is situated on a narrow submarine reef, which is considered as one of the most diverse and productive coral reefs in the country.

The problem of multi-user conflict over sea space arose when the tourism and related transportation and recreational industries sought a footing in the area, which earlier had been the exclusive domain of mainly beach seine and trap fishers. The local fishers considered the area as communal property over which they had exclusive territorial rights. The intrusion of outsiders was therefore enough to galvanize them to organize and defend their communal territorial rights.

As a result of the intensification of the pressure on the resource, evidence of habitat and resource degradation was emerging. The government's first response in 1986 was to declare some areas as Fishing Priority Areas and Marine Reserves, but this failed to settle the issue. The next attempt, in 1992, was to embark on a complex, extensive and intensive mix of public awareness building and consultation processes, involving all the stakeholders, in a bid to seek solutions to the problem; solutions to which all participants would have contributed and could therefore identify with. The leading organizers of this participatory search for solutions were the Fisheries Department, the Caribbean Natural Resources Institute (CANARI), an NGO, and the Soufriere Regional Development Foundation. Preliminary agreement reached in 1993 among all the stakeholders was a system of space allocation and zoning, including redefined fishery priority areas, marine reserves, multiple use areas, recreational areas, and areas for specific tourism-related activities. This has resulted in the return to the fishing community of the exclusive use rights to the resources, albeit over a smaller area than previously.

The final agreement of this participatory planning and negotiation process was reached in 1995 with the establishment of a general management body, the Soufriere Development Foundation. This body is made up of representatives from all major stakeholders and makes decisions about rules in the area. The legal backing for this co-management arrangement comes from the St. Lucia Fisheries Act which allows for the establishment of local fisheries management areas, under an organized body, considered to represent the interests of the fishers (Brown and Pomeroy 1999).

INLAND OPEN-WATER FISHERIES MANAGEMENT IN BANGLADESH

In pre-colonial Bangladesh, fisheries were managed by the local community as common property with complex systems of tenure. Following colonization, the British pressed for maximizing state revenues and gave zamindars (feudal lords) proprietary rights of use, management, and exclusion over water bodies within their estates. A nominal tax was collected from fishers in exchange for use rights (Ahmed et al. 1997).

In 1950 the zamindar system was eliminated and the government, through the Ministry of Lands (MOL), acquired authority and proprietary rights over the water bodies. The MOL managed the water bodies by leasing fishing rights for 1-3 years to the highest bidder, a private or corporate entity, who thereby acquired exclusive rights to determine fishing access to the water body. The leaseholders usually allow as many fishers and collect as much rent as possible during the tenure of their lease. Through this system, traditional fishers lost significant use rights. Hindu fishers lost access to the water bodies since Bengali Muslim fishers have better access to local power brokers.

In an attempt to deal with this inequitable situation, the New Fisheries Management Policy (NFMP) was initiated in 1986. Through a system, administered by the Department of Fisheries (DOF), of annual gear-specific licensing, access and withdrawal rights, water bodies were reserved for the poor "genuine" fishers who depend on full-time fishing for their livelihood. Licensees were expected to obey and enforce rules and regulations. Gear-specific licensing was intended to ease the pressure on fisheries by regulating harvest. Limiting use rights to genuine fishers was meant to ensure that they got a greater share of fishing income (Ahmed et al. 1997).

Following the NFMP, a number of programs and projects were initiated by the Department of Fisheries, the National Fishermen Association and several NGOs to manage the fisheries. Over 1000 water bodies are now managed through a range of co-management arrangements. One example is the Oxbow Lakes Project II, which was executed by the DOF and the NGO Bangladesh Rural Advancement Committee (BRAC) in five districts around Jessore. An oxbow lake (baor) is an old cut-off river bend, usually in the shape of a horseshoe or ox-bow. Users are organized in Lake Management Groups (LMG) and manage the resource themselves. Each LMG consists of a Lake Fishing Team (LFT) and a Fish Farming Group (FFG). The fishers use rights of the baors are leased by the DOF to the LMG of each baor. The LFT and the FFG share the baor lease fee, pro rata to the area occupied by ponds and open water. Fishers

are provided easy access to credit. Since there was no tradition of collective action among fishers organizing efforts and capability-building efforts were undertaken by the project staff.

The LFT fishers receive an equity share of the day's catch, thereby ensuring active participation of all LFT members. Only licensed fishers are allowed to fish in the baor and poaching has been effectively reduced because all villages around the baor are represented in the LFT and FFG. Rules are established by the LMG through a participatory process in monthly general meetings. No leader is allowed to have a successive term (Middencorp et al. 1996).

By providing long-term security of tenure to the resource, equity of access to the baor improved, and fish yields and incomes increased steadily. By giving the people who actually fish a stake in the fish yield, they will invest time and money in maximizing the yield over the long-term.

MANGROVE REHABILITATION AND COASTAL RESOURCE MANAGEMENT PROJECT IN COGTONG BAY, BOHOL, PHILIPPINES.

Cogtong Bay is located in the eastern coast of Bohol in the central region of the Philippines. Mangroves fringe the coastline. The degradation of the Bay began in the 1960s when large areas were clear-cut to make room for fishponds. In the 1970s, commercial mangrove harvesting was initiated. By the mid-1970s, the fishers around the bay began to experience declining fish catch. The open access nature of the resource and lack of vigilant law enforcement fostered illegal fishing practices. The situation was aggravated by the fragmentation of resource management functions among national government agencies and unclear jurisdiction over coastal resources management. The shift from subsistence village economies to market-driven economies for certain coastal products opened new linkages to outside markets which intensified resource use.

Recognizing the importance of the fishery, and at the insistence of local fishers, the Municipal Councils of the two municipalities bordering Cogtong Bay began to increase efforts to conserve the fishery resources. A marine park was established in 1978 where only subsistence fishers were allowed to fish with selected gear. In the 1980s, both Councils passed further legislation that restricted illegal fishing methods. However, the Bay had already become a haven for illegal fishers and mangrove harvesters. On their own the Municipal Councils could not fully deter violators.

In 1989, a major project was initiated to promote sustainable coastal resource management. A local NGO, working in partnership with the Department of Environment and Natural Resources (DENR), and with funding from USAID, adopted a co-management approach to address the problem of resource degradation and poverty in coastal villages surrounding the Bay. The co-management strategy recognized that the coastal residents are the day-to-day managers of the coastal resources. The project sought to transform the resource users into both resource users and managers. The

project had four components: (1) community organizing, (2) mangrove rehabilitation, (3) coastal management, and (4) mariculture. Central to project implementation was the provision of secure mangrove tenurial rights to local fishers. Working with the DENR, the individual fishers were issued 25-year certificates of stewardship contracts (CSC) to manage and use the mangrove in designated areas. Within the boundaries of the CSC, the mangrove stewards can restrict access and withdrawal. CSC holders have the right to peacefully possess and cultivate the land and enjoy the fruits. They are entitled to harvest the mangroves, provided they replant the trees. Non-CSC holders are not allowed to cut mangrove trees in the CSC-covered areas. As a result of security of tenure, the holders of the CSC are now reforesting the mangrove areas and protecting them from illegal cutters, long after the project was completed in 1991. Mangrove cover has increased and consequently also fish yields (Katon et al. 1998).

THE MARINE CONSERVATION PROJECT OF SAN SALVADOR, MASINLOC, ZAMBALES, PHILIPPINES.

San Salvador Island community resides in a 380-hectare village that forms part of Masinloc municipality in the province of Zambales, Philippines. It is located on the western coast of Luzon, about 250 km from Metro Manila. Until the late 1960s, the prevalence of abundant marine resources, socioeconomic homogeneity of village residents, and a subsistence village economy enabled the residents to live together with minimal resource use conflicts. In the 1970s, the scenario began to change due to three major events: 1) influx of migrants from the central Philippines who brought with them destructive fishing methods; 2) integration of the village economy into the international market for aquarium fish; and 3) pronounced shift to destructive fishing operations such as blast fishing, aquarium fish collection using sodium cyanide, and use of fine mesh nets that indiscriminately caught large and small fish alike. Together, these events led to the progressive devastation of San Salvador's fishing grounds.

The effects of fishery depletion and destruction of coral reefs began to be felt in the 1980s. Open access to the resource, rapid decline in fish stocks, and existence of unscrupulous village residents contributed to worsening resource conditions. The highly centralized national government of the Philippines at that time was too distant to control the situation, while the San Salvador fishers themselves were too fragmented to embark on any collective action to avert resource degradation. Village fishers reported that their average fish catch per unit effort dwindled from 20 kilos in the 1960s to 1-3 kilos in 1988. Many reef fishes, such as groupers, snappers and damselfish, became scarce. A pre-project coral reef assessment in 1988 indicated an average of 23 percent living coral cover for the entire island (Christie et al. 1994).

External change agents were instrumental in improving resource management measures. A local NGO initiated a community-based management project which included the establishment of a marine sanctuary that featured a biological intervention (i.e., marine sanctuary and reserve) and a governance intervention (i.e., establishment of

rights and rules for fisheries management). In addition, it encouraged the formation and strengthening of local groups responsible for marine resource management and income-generating projects. Central to the achievement of the project's goal was the community organizing process. Despite the absence of a tradition of collective action in fisheries management and the existence of heterogeneous village residents, the project succeeded in mobilizing the residents to take collective action on resource management problems.

In 1989, the core group members spearheaded a campaign to support the 127-hectare marine sanctuary and reserve of San Salvador. Together with external agents, they also drafted a local ordinance that banned fishing within the sanctuary and allowed only non-destructive fishing methods in the marine reserve. Only hook and line, bamboo traps, gill nets (3 cm or larger), spear fishing without compressor, and traditional gleaning were allowed in the reserve. In response, the Masinloc Municipal Council passed an ordinance in July 1989 that helped provide legitimacy to the San Salvador marine sanctuary and reserve at the local level. The passage of the Local Government Code in 1991 allowed for a formal legitimization of the sanctuary in 1992. The core group members were active in monitoring illegal fishing activities and in guarding the sanctuary with the assistance of village fishers. The participation of other resource users was seen in their attendance at village consultations, endorsement of appropriate measures and local ordinances, adherence to legitimate rules, and adoption of non-destructive fishing technologies, among others.

While these activities were not conceived as a co-management project, the Masinloc municipal government, which has political jurisdiction over San Salvador, was drawn into the picture in several ways: 1) passage of enabling legislation (Municipal Ordinance 30-89) in July 1989, which provided a legal basis for sanctuary management and for apprehending rule violators; 2) mediation of conflicts between village-based resource users as well as between local and outside resource users; 3) provision of a motorized boat, hand-held radios, and fuel for patrolling the coastal waters in response to the request of San Salvador residents; 4) formal creation of a patrol team in 1993 to enforce fishery laws, known as the Bantay Dagat; and 5) provision of a political environment that allowed the pursuit of community-based initiatives. The NGO turned over the project in 1993 to the village-based fishers' organization it helped establish, known as the Samahang Pangkaunlaran ng San Salvador (SPSS).

Co-management became increasingly visible in the post-project phase. The Village Council and the Municipal Council have taken a more active role in sustaining project initiatives by providing funds, personnel and strengthened enabling legislation for resource management. Led by the Masinloc municipal government, law enforcement is now a collective responsibility of the government-deployed Bantay Dagat, fishers' organization, and the village police.

Comparing biological changes over time, the overall condition of living coral cover improved from an average of 23 percent for the whole island in 1988 to 57 percent in

1998. Moreover, fish species richness improved from 126 species belonging to 19 families in 1988 to 138 species belonging to 28 families in 1998 (Katon et al. 1997).

CO-MANAGEMENT AND COLLECTIVE ACTION

Property rights address resource ownership and management. They define the required mechanisms and the structures to optimize resource use and conservation, along with the means and procedures for enforcement. Without state-legitimated property rights, resource users will find difficulty in enforcing their claim over the resource against outsiders. The San Salvador experience shows that local initiatives require active collaboration with the government in enforcing user rights. When property rights are clearly specified, legitimate, and enforced, as with the marine reserve and sanctuary, there is a much greater chance that the intervention will be maintained.

One fundamental debate in co-management is whether resource users can be entrusted to manage their resources (Berkes 1989). Unless governments and decision-makers who implement government policies can be convinced of the desire and the ability of users to manage themselves, not much progress can be made in co-management. It is often pointed out that government resource managers are reluctant to share authority. However, it would be a mistake to interpret this solely as a self-serving motive to hang onto political power. Many managers have well-considered reasons to be skeptical about local-level management. To convince managers that local-level management is possible, part of the responsibility falls on the resource users themselves. The ability for self-management, in turn, partially depends on the ability of the local community to control the resources in question.

Managers' reasons for skepticism include the lack of appropriate knowledge on the part of the fishers, and the ability of fishers to organize themselves to manage for long-term sustainability. Each of these points opens up its own debate. Even in countries with high standards of education, it is true that fishers tend to have lower levels of education than the general population. But the relevant knowledge held by fishers in many areas of the world may be extremely detailed and relevant for resource management (Johannes 1981; Freeman et al. 1991; Berkes et al. 1995). Indeed, it is the complementarity between such local knowledge and scientific knowledge that makes co-management stronger than either community-based management or centralized management.

Experience from the Philippines, the country with the greatest number of fisheries community-based management and co-management projects in the world, has shown that fishers have difficulty in organizing themselves for collective action. Among other things, theory of collective action states that when a group of individuals is highly dependent on a resource and when the availability of that resource is uncertain or limited, especially if the resource problem is repeatedly experienced, the group will develop collective institutional arrangements to deal with the problem. In reviewing the Philippine projects, it was found that fishers often recognize that a problem exists, they

will discuss the situation among themselves, and they will discuss possible solutions to the problem, but very few groups of fishers will take action to either formally organize themselves or to develop institutional arrangements (rights and rules). Our review found that in less than 20 percent of the cases did the fishers take action on their own initiative to organize and develop institutional arrangements (Pomeroy et al. 1999). Leadership seems to be the limiting factor for fishers to take collective action. Either no individual is willing to step forward to lead, there is no one in the community with enough credibility among the fishers to lead, or divisions within the community or group of resource users will not allow for a leader to emerge. If enough initiative exists among the fishers they may approach a supportive politician and ask for assistance or they may contact an external change agent, such as a non-governmental organization (NGO), academic or research institution, to assist in community organizing and development of institutional arrangements.

A second factor required by fishers to take collective action is that an incentive, whether economic, social and/or political, must be present, recognized and agreed upon by the fishers. The incentive must exist at both the individual and group levels. There must be an inherent strategic benefit and advantage to engage in the new arrangement. The incentive cannot be imposed from outside but must be internally generated. A review of projects in the Philippines found that project failure occurred most frequently when fishers did not perceive the same incentive for change as did the project implementers. Positive cultural attitudes toward efficacy of collective action were consistently related to perceptions of positive change resulting from the project (Pomeroy et al. 1996). Information and education has proven to be an important intervention in assisting fishers to take collective action and cannot be divorced from the organizing work. Fisher-to-fisher transfer of knowledge and experience, from fishers who have benefited from collective action to those contemplating collective action, is a useful education method.

Since fisheries resource systems do not come in one size, neither should their governance arrangements. The appropriate scale for organizing fishers for collective action seems to be somewhere between the individual household level and the whole village level. The term "community"-based management is most often used, but the question of what is the "community" to be organized is central to collective action. Among NGO practitioners and researchers in Asia, the term community, for organizing purposes, is defined as any group of resource users with common interests. In the Philippines, while projects are often implemented at the spatial scale of a village, organizing efforts are undertaken with a sub-group of the village. This may be a group of fishers using a similar fishing gear, a group that fishes in the same area, or all the fishers in the village. An organizing effort is usually undertaken with a minimum size of five fishers but no more than 50 fishers. Administration becomes difficult in larger groups. There may be multiple groups in a village or nested institutions which protect

the interests of the larger community while allowing for flexible management arrangements for the smaller groups. These may be further organized into a federation. In the inland open waters of Bangladesh, Lake Fishing Teams are organized based on the number of fishers who generally operate from one boat. Each team is represented on a Lake Management Group which makes overall decisions about lake management.

Fishers' ability to organize for collective action has a number of prerequisites, essentially involving the question of local institutions, defined here as the set of rules actually used (rules-in-use) by a group of individuals to organize their activities (Ostrom 1990; North 1990). Not all groups of fishers have appropriate local institutions; in such cases, any co-management initiative will necessarily start with institution-building. But institution-building is a long-term and costly process. Community organizing can take from three to five years before a self-sufficient organization is in place, on the basis of cases in the Philippines (Carlos and Pomeroy 1996), and five to ten years on the basis of a case in St. Lucia, West Indies (Smith and Berkes 1993). In the coastal fishery of Alanya on the Mediterranean coast of Turkey, locally designed rules for resource allocation and conflict reduction, by means of rotating and taking turns at fishing sites, developed over a period of ten to fifteen years in the absence of government support or any other external intervention for institution-building (Berkes 1986).

Such experiences indicate that there often is a readiness and willingness on behalf of some groups of resource users to take responsibility for management. Thus, a key question for co-management is what management functions are best handled at the local or communal level, as opposed to the national government level. Pinkerton (1989) identified seven resource management functions that may be enhanced by the joint action of users and government resource managers at the local level: (1) data gathering, (2) logistical decisions such as who can harvest and when, (3) allocation decisions, (4) protection of resource from environmental damage, (5) enforcement of regulations, (6) enhancement of long-term planning, and (7) more inclusive decision-making. No single formula exists to implement a co-management arrangement to cover these functions. The answer depends on country-specific and site-specific conditions, and is ultimately a political decision.

The benefits sought by all actors in co-management are more appropriate, more efficient, and more equitable management. These benefits become concrete when considered in association with the following processes and goals: (1) co-management for community-based economic and social development, (2) co-management to decentralize resource management decisions, and (3) co-management as a mechanism for reducing conflict through a process of participatory democracy. Resource users have the benefit of participating in management decisions that affect their welfare; government has the benefit of reduced challenge to its authority (Pinkerton 1989; Jentoft 1989).

THE ESTABLISHMENT OF CONDITIONS FOR CO-MANAGEMENT

Increasingly, government policies and programs stress the need for greater resource user participation and the development of local organizations to handle some aspect of resource management. In the area of fisheries, this trend is international in scope and can be observed in a number of countries in the Americas, Europe and Asia (Jentoft and McCay 1995; Pomeroy 1995; Sen and Raakjaer-Nielsen 1996). A review of the international experience shows that policies favoring co-management are a necessary but not sufficient condition for successful co-management. There are only two well-documented cases of long-standing marine fishery co-management arrangements that work, in Norway (Jentoft 1985, 1989) and in Japan (Ruddle 1987; Lim et al. 1995), and both of them have a legal basis. This suggests that it may be insufficient for governments simply to call for more community involvement and fisher participation; they must also establish commensurate legal rights and authorities and devolve some of their powers. The delegation of authority and power sharing to manage the fisheries may be one of the most difficult tasks in establishing co-management. Government must not only foster conditions for fisher participation but sustain it.

As a first step, government must recognize local institutions as legitimate actors in the governance of fisheries resources. At a minimum, government must not challenge fishers' rights to hold meetings to discuss problems and solutions and to develop organizations and institutional arrangements (rights and rules) for management. Fishers must feel safe to openly meet at their own initiative and discuss problems and solutions in public forums. They must not feel threatened if they criticize existing government policies and management methods. As a second step, fishers must be given access to government and government officials to express their concerns and ideas. Fishers should feel that government officials will listen to them. As a third step, fishers should be given the right to develop their own organizations and to form networks and coalitions for cooperation and coordination. Too often there has been the formation of government-sponsored organizations which are officially recognized but ineffective since they do not represent the fishers, but these may be the only type of organization a government may allow. Fishers must be free to develop organizations on their own initiative that meet their needs.

Fishers often develop their own rules for management in addition to those created by government. For example, fishers may establish rules defining who has access to a fishing ground and what fishing gear can be used. The fishers may be able to enforce the rules as long as there is at least a minimal recognition of the legitimacy of these rules by the government. This can be formal, as through a municipal ordinance, or informal, as through police patrols to back-stop the local enforcement arrangements. If government does not recognize the legitimacy of the rules, then it will be difficult for the fishers to maintain the rules in the long run (Ostrom 1994). Thus, the role of government in establishing conditions for co-management is the creation of legitimacy

and accountability for the local organization and institutional arrangements. The government, through legislative and policy instruments, defines power sharing and decision-making arrangements. Only government can legally establish and defend user rights and security of tenure. One means of establishing these conditions is through decentralization.

DECENTRALIZATION AND CO-MANAGEMENT

Decentralization refers to the systematic and rational dispersal of power, authority and responsibility from the central government to lower or local level institutions—to states or provinces in the case of federal countries, for example, and then further down to regional and local governments, or even to community associations. The approach of decentralization is for the center to delegate some measure of its power to the lower levels or smaller units in the government system. Increasing local autonomy is a focal point in the decentralization process. Generally, power and authority are transferred or withdrawn by laws enacted in the center.

In many countries, government programs and projects stress the development of local organizations and autonomy to handle some aspect of fisheries management. Seldom, however, is adequate attention given to the establishment of administrative and policy structures that define the legal status, rights and authorities essential for the effective performance of local organizations. Many attempts at decentralization have not delivered a real sharing of resource management power.

Initiatives in community-based resource management in Asia, for example, have been popular throughout most of this century under different names. However, as Korten (1986) explains, none of these approaches to stimulating local initiatives provided a fundamental challenge to the idea that the government does development for the people, who are expected to respond with grateful acceptance of whatever guidance and assistance government chooses to offer. None challenged the nature of the government's role or the appropriateness of the structures and procedures through which government conducts its business. None confronted basic issues of local social structures and resource control.

If new fisheries co-management initiatives are to be successful, these basic issues of government policy to establish supportive legislation, rights and authority structures must be recognized. The devolution of fishery management authority from the central government to local level governments and organizations is an issue that is not easily resolved. Legislation and policy for co-management are embedded in a broader network of laws, policies and administrative procedures, at both national and local government levels. Consequently they will be difficult to change. Government administrative and institutional structures, and fisheries laws and policies will, in most cases, require restructuring to support these initiatives.

In some cases, it may be more feasible and desirable to draw up completely new legislation, rather than to modify existing acts. A case in point is the establishment of

Mafia Island Marine Park in Tanzania. The idea of a marine protected area developed in the course of an environmental assessment process regarding petroleum exploration. Local fishers were involved in the assessment process to provide information on resources. Initially, a reserve was set up to protect fishery resources; by 1991 it had evolved into a locally managed marine park. But it became obvious soon that the needs of the local people could not be met under the existing fisheries legislation. New legislation was developed with support from international conservation organizations and the FAO, and the Tanzania Marine Parks and Reserves Act came into being in 1994. This act provided for the formal inclusion of village council representatives on the technical committee for the Mafia Island Marine Park for co-management and for the sharing of benefits (Ngoile, IUCN, personal communication).

As the Tanzania case illustrates, the actual form of co-management will depend upon the type of government and the political will for decentralization. In general, co-management is consistent with the aims of democratization and empowerment. In the first place, the goals of co-management include the greater participation of fishers in the fisheries management process, more self-reliance of local level institutions, and a more responsive decision-making process. The ultimate goal of decentralization is greater participation and efficiency by getting people at lower levels more involved in the decision-making processes and procedures that affect them. One assumption of decentralization is that the deployment of power and resources to the community will enhance community and economic development. Thus, the promise of decentralization is greater democratization and development of local communities. In this assumption, an important concern is the significance of intervening variables such as leadership, skills of fishers, resources, and capabilities of local institutions.

In detailing the specifics of the decentralization strategy, questions of implementation become crucial points of debate. What powers and functions, for instance, can be properly entrusted to local institutions and which institutions—local government or user group? What are those that should be left to the central government? How is the sharing of resources to be administered? What should be the role of non-government organizations and people's organizations (an organized group of individuals with similar interests)? What is the proper and appropriate mix of government and private sector participation? Will decentralization occur only for the fisheries bureaucracy, or will it be a government-wide initiative? This collection of issues impinges on decentralization strategies and drives the political debate associated with decentralization.

DISCUSSION

International experience suggests that fisheries co-management does not come about automatically but requires some impetus. Most commonly, it is the recognition of a resource management problem that triggers co-management. Problem recognition

may be related to resource deterioration (as in the case of the Philippines and the Tanzanian marine protected area), conflicts between stakeholders (e.g. Norway's Lofoten cod fishery and Philippines coastal fisheries), conflicts between management agencies and local fishers (e.g. Canada's Atlantic coast fishery), and governance problems in general (e.g. Philippines, the United States Fishery Conservation and Management Act, and northern aboriginal land claims in Canada). In this regard, the experience with fisheries co-management is similar to the international experience with the co-management of protected areas (McNeely 1995; Borrini-Feyerabend 1996), forests (Lynch and Talbott 1995), wildlife (Martin 1986), and other resources.

In each case, governments have turned to co-management as a means of responding to a management crisis, and sometimes to a management opportunity, as in the case of resource rehabilitation projects and perhaps also in some land claims agreements. Decentralization is a pre-condition that can enable co-management. Various types of decentralization can be used by governments to establish conditions conducive to co-management. The strategies of co-management not only respond to management crises, they also offer the promise of increased democratization, and empowerment and development of regional and local communities. The goals of both co-management and decentralization are the mobilization and strengthening of people's participation in government and more equitable distribution of power and resources to local-level groups of people and communities (de Guzman 1991).

The form and process of decentralization and co-management can be seen as a focus for user participation in management. Decentralization in a governmental context may proceed in the logical sequence of: (1) organizational and physical deconcentration; (2) administrative delegation; (3) political devolution; and (4) popular privatization (Gasper 1991). These modes of decentralization may occur separately or in a cumulative package. Thus, decentralization can be seen as a continuum ranging from deconcentration to privatization where increasingly more power and authority is delegated to local-level. Similarly co-management can also be viewed as a continuum based on the role(s) played by government and resource users (Berkes 1994; Pomeroy and Williams 1994; Sen and Raakjaer-Nielsen 1996). In both decentralization and co-management, the central government acts to delegate power and authority to local-level institutions.

The form of decentralization will depend, like the form of co-management, on country-specific conditions. There is no one "best" form of decentralization to support co-management, as there is no one "best" form of co-management. Decentralization can occur as a broad administrative mandate of which fisheries is included, as in the case of the Philippines, or it may occur for specific management functions, as is the case in Japan and Tanzania. Both co-management and decentralization should be viewed as an evolving process that adjusts and matures over time.

The co-management process, however, is laced with potential roadblocks and pitfalls. Politicians and government agency administrators may be reluctant to relinquish their authority or portions of it. Local power and authority may fall into the

hands of leaders and groups who are not committed to its basic values and goals. An important concern for the success of both decentralization and co-management are variables such as leadership, skills, resources, and capabilities of local-level organizations and institutions. When government and user groups work together and reinforce each other the results can be improved management. However, the decentralization process can also represent shifts in leadership and power bases at the community level which can lead to social, political and economic fragmentation in the community and further resource overexploitation and degradation.

The process of developing a co-management system will likely involve the restructuring of national laws and policies, as well as national fisheries agencies and bureaucracies. Existing national laws and policies usually do not include specific reference to such functions of co-management as the security of local-level tenure and property rights over coastal resources, people's participation, and the recognition and incorporation of local traditional/informal/folk management systems. New laws and policies may need to be developed and/or existing laws and policies amended or reinterpreted to authorize and legitimize these functions of co-management. Both the Philippines and Thailand, for example, are undertaking such a process (Pomeroy 1995). New laws and policies may need to be reviewed to identify compatibility with laws and policies in other sectors and with overall administrative procedures. National fisheries agencies and bureaucracies may require restructuring to take on the new responsibilities and functions required by co-management and decentralization. Issues of coordination, communication and role definition must be addressed. Government agencies must be shielded from short-term political pressures to change or dilute goals of the power-sharing arrangements under co-management.

The role of the government in co-management is to provide enabling legislation to authorize and legitimize the right to organize and to make and enforce institutional arrangements at the local level. In the case of protected marine area co-management in Tanzania, for example, a series of enabling legislation was passed in the 1970s and the 1980s in support of decentralization. Although it is generally thought that the Tanzanian experiment in self-reliance and local democracy did not live up to its potential (Chambers 1985), this legislation nevertheless enabled districts and villages to manage their own affairs, and served as the basis of new legislation for marine parks and co-management.

In addition to its role in providing enabling legislation, the government may act to address problems and issues beyond the scope of local arrangements, and to provide assistance and services (administrative, technical and financial) to support the sustainability of the local organizations and institutional arrangements. More specifically, the role of government includes overseeing local arrangements and dealing with abuses of local authority, conflict management, appeal mechanisms, backstopping local monitoring and enforcement mechanisms, and applying regulatory standards.

Government may also serve a coordinating role by maintaining a forum or formal administrative structure where the various parties can interact. Within a co-management system, government and fishers jointly develop an agreement on the objectives of co-management including the aims, the form, and the means. A clear understanding of the long-term goals of power-sharing is established in which the differing interests and needs of government and fishers are reconciled.

The decision on what fisheries management functions should be undertaken at what level is best handled jointly by local-level organizations and government, whether national or local, and the outcome will be location specific. The decision will be based on the capabilities of local-level organizations to handle certain management functions and the level of user participation. Some fisheries management functions may be beyond the capabilities or scope of the resource users and should be handled by the government. For example, while data collection may be conducted by the resource users, high-level data analysis will require equipment and expertise that is most often available from the government. The government should retain responsibility for the provision of an overall policy framework for conservation and management. Multi-jurisdictional and multi-user coordination in management may best be handled by an institution which is external to the community. Similarly, management of resources on a large-scale ecosystem basis may best be managed by an external institution. For example enforcement and adjudication of violators of local regulations, once identified by the resource users, may best be handled by the government though the police or military. The government can act as an arbitrator of last resort in the management of conflict and guarantee equality of advocacy in disputes.

It may be more appropriate to phase-in management functions over time as local-level organizations gain more experience and capability, rather than give them a defined set of functions. The phasing in will also depend on the form of both co-management and decentralization, but adaptive management or 'learning-by-doing' in the evolution of co-management, and feedback learning in general, is likely to be critically important (Lee 1993).

Ultimately, whatever form of decentralization arrangement for co-management is chosen, the process is political, involving mobilization of interests and struggle for power. Co-management will not work everywhere in a country. However, co-management should be viewed as an alternative to the centralized management system which in many cases has shown not to work effectively. Governments may want to consider developing a general policy within the existing legal and policy framework of the country which allows for the existence of co-management in areas and communities which are capable of taking on the responsibility and authority for management. Laws and policies may then be developed under a framework of decentralization which legitimizes and authorizes co-management. During the whole process careful attention needs to be paid to what is happening on the "ground". Experience shows that interests at both the national and lower levels will work against decentralization of authority when it means a decrease in their own power. There is no blueprint formula for either

co-management or decentralization. Each country will need to develop a strategy based on its own needs and conditions. Several decades of experience in different countries provide some directions for developing a co-management strategy based on decentralization. Decentralization and devolution of power are a necessary, but not sufficient condition for co-management to occur. Through decentralization, government must establish conditions for the specification, legitimization and enforcement of property rights and fishers' rights to organize and develop rules for management. This has been found to be crucial for the success of co-management throughout the world.

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