

Mainstreaming fisheries co-management in the Asia-Pacific

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FOREWORD

This report provides a concise summary of the “fishery co-management” concept. It builds on the vast experience already gained in fishery co-management in the Asia-Pacific region that has been led, in the main, by projects supported by donors. It is argued that given the short-term success of many of these projects, and the adoption of decentralization policies in many countries in the region, it is timely to move fishery management more into mainstream, government-supported management processes (i.e. mainstream fisheries management).

Four pillars for successful mainstreaming of fisheries management are described: (i) enabling policy and legislation; (ii) empowering communities; (iii) linkages and institutions; and (iv) resources, both people and money. While recognising the differences among countries in the region, it is important to consider all of these concurrently and adopt an adaptive learning process whereby lessons learnt are shared and best practices promoted.

It is hoped that the foundations laid down by this report will assist governments and other major stakeholders to mainstream fishery co-management into national management regimes. This report formed the concept paper for the recent *Asia-Pacific Fishery Commission (APFIC) Regional Workshop on Mainstreaming Fishery Co-management* that developed an action plan that sets out collective action to be implemented by national governments, regional fishery bodies, resource users and non-government organizations. The report of the workshop can be found on the APFIC website: www.apfic.org.



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Executive summary

There is a long tradition of fisheries management in the Asia-Pacific region. Traditional (or customary) fishery management systems evolved over centuries in response to increasing population pressures and the need to resolve disputes over access and exploitation of fishery resources. The control of access to what were initially “common property” resources was originally the responsibility of local communities and customary fishery organizations but these systems broke down or are breaking down owing to modernisation. Fishery modernisation typically involves mechanization of fishing vessels (or fleets) and the adoption of new gears and technologies. This is accompanied by a shift to government-driven scientific/economic management of the resource (through legislation) and removal of traditional management mechanisms (this may only be a lack of formal recognition, although traditional or local management systems often persist in some form at the local level and can be the basis for the establishment of a co-management system). The logic for the transfer of management responsibility to government was driven by the model used in more temperate developed countries at that time and reinforced by the theory of the “tragedy of the commons”, which assumes that management of common property resources by individual “users” inevitably leads to their overexploitation.

Unfortunately, government-managed models of management have also proved to be largely unsuccessful in managing open access fishery resources both in countries where they originated and in countries where they were adopted. Over the last 20 years it has become increasingly apparent that management initiatives will not be effective if the resource users (communities and fishers) are not fully involved in the management process. Focus has therefore now shifted from scientific/economic management models to those of co-management that involve both governments and communities/resource users in sharing decision-making and planning, to varying degrees.

Recent experience with piloting co-management in many countries in the region has shown that it can be successful and that those exploiting the resources are capable of managing the fishery for specific purposes (this may not always focus on the resource and may be more directed towards conflict reduction etc.). However, there are also examples of situations where co-management initiatives were not sustained.

Four pillars are considered essential for successful co-management, these are: (i) an enabling policy legislative environment; (ii) empowerment of communities; (ii) effective linkages and institutions; and (iv) adequate resources – a fishery resource considered worth managing, and the people and finances to implement the system.

An enabling policy and legal framework is essential to ensure that governments have appropriate policy in place to support co-management. Whilst the state is entrusted with the management of the resource, it can assign responsibility to or recognize the competence of local communities/individuals for the management of fisheries. In so doing, local ownership improves compliance with locally agreed rules and greatly improves compliance with national legislation. An important feature of this is a robust enforcement mechanism and the existence of implementable sanctions to ensure compliance with the locally agreed rules. A critical step in the evolution of co-management is the government’s (either locally or nationally) demonstration of its willingness to change policy, involve communities in the preparation of policy/laws, define roles and responsibilities of organizations and devolve power to local agencies.

Communities (both small-scale fishing communities and large-scale industrial groups) involved in co-management must also be empowered in order to participate effectively and ensure sustained involvement. There must be genuine sharing of power between governments and resource users in policy development and decision-making. Often, other (non-fisheries) users of the resource such as farmers and the tourism industry will also need to be involved in some stages of the process. Governments and other agencies must recognize the competence of fisher organizations and allow them to make their own rules.

Effective co-management requires good linkages between participating stakeholders. The networks of stakeholders must be understood and encouraged to share information. It must also be recognized that in a co-management system success criteria may differ between stakeholders and that there may be differing priorities and emphasis on management objectives. Ecological well-being (or “state of the resource”) must be balanced with human well-being (i.e. the need for food or income) and this inevitably requires management trade-offs that must be recognized and addressed. Communication and dialogue between stakeholders such as researchers, government fishery agencies and fishers must also take place effectively and be part of a participatory process.

Lastly, it must be recognized that effective co-management requires the existence of a resource that is considered worth managing since it requires the input of resources (time, effort, finance) by those involved. The transaction costs for participation in meetings, monitoring, enforcement and management can be considerable and are often underestimated at the commencement of a co-management initiative. Governments and communities must recognize and commit to providing these resources, otherwise these initiatives cannot be sustained.

Our current state of knowledge shows that there are no simple formulae to ensure success in fisheries co-management initiatives. What works in one area may be inappropriate or fail in another for many different reasons.

1. Introduction

1.1 Fisheries management in Asia-Pacific

Fisheries management involving fishers and fishery resources is a historical practice in the Asia-Pacific region. In Japan, for example, the earliest legislation relating to management of coastal resources dates from AD 701, stating that these were “common use” and managed by local communities (Box 1).

Box 1 The history of fisheries management in Japan

Japan has one of the oldest and most successful fishery co-management regimes. The key points in the evolution of current fisheries institutions and management include:-

- The early feudal era (1603-1700): communities controlled adjacent coasts and were responsible for establishing rules for exploitation. The offshore areas were open access.
- Late feudal era (1700-1886): Fisheries became labour intensive and controlled by a few wealthy operators. Large scale operators exploited offshore areas.
- Modernisation (1868-1901): Government attempted to introduce top down management systems (and fails). Returned to customary arrangements with communities controlling adjacent coast.
- Meiji fisheries law (1901-1945): Fishing rights granted to local societies and individuals. Offshore licenses given to both individuals and representatives.
- Current fisheries law: Fishing rights granted to both cooperatives and associations to exploit coastal areas. Licenses granted to individuals for exploiting offshore areas.

(Makino and Matsuda, 2005)

In Cambodia (Box 2), indigenous systems were used to manage the Tonle Sap legislation dividing the Tonle Sap into lots. Records from Kerala, India from the 12th century refer to fishing methods and the “arts and sciences” of fishing in what was considered a plentiful resource. Traditional institutional arrangements for defining access called “courts of the sea” (*kadakodi*) have also had “long histories” in that area (Kurien, 2001).

Box 2 The history of fisheries management in Cambodia (Tonle Sap)

In Cambodia, the resources of the Tonle Sap have been harvested to provide fish and forest products for many thousands of years. Seasonal migrations of lake dwellers were recorded as early as 1296. The key points during the evolution of the lake management systems include:-

- Khmer empire (Angkor) to AD 1500: Seasonal migration of lake dwellers occurred to exploit fisheries and forestry resources along with rain-fed agriculture.
- Colonisation (1859-1975): The lake was divided into fishing lots. These lots were auctioned to generate income for the government.
- 1975-1985: Management of fisheries resources neglected in favour of agriculture. Fishing lots operated on communist development principles.
- 1980-1999: Returned to auctioned “lot” system.
- 1999-present: Policy changed dividing up the lots and allowing management by local communities

(Evans *et al.*, 2004)

Extensive evidence exists of centuries-old community-based management systems in the Pacific islands (Johannes, 2002; MRAG, 2005), where traditional management systems have also been in place for many generations. Examples include *qoliqoli* (traditional fishing areas) in Fiji, village *fono* (council) rules in Samoa and what is referred to as the Samoan way (*Fa'a Samoa*), founded on custom, and the traditional form of community management initiated by the Island Councils in the Cook Islands known as the *Ra'ui*.

The earliest examples of fisheries management indicate that it emerged as a collective decision-making process at the community level. Allocation or access to resources tended to be more directed at reducing conflicts than management of the resource. As societies have changed, so have their abilities to cooperate and manage resources (Richerson *et al.*, 2002). How, when and where fisheries management emerged in different countries has depended on the historical and societal context of each particular situation. However, the emergence of fishery management institutions has nearly always been as a response to a crisis and the recognition that there was a problem with the exploitation of the resource (e.g. reduced stocks or need for revenue). In San Salvador Island in the Philippines, for example, there was no history of traditional fisheries management amongst the initial migrants prior to 1960, and the fishery was effectively an “open access” system. Increasing migration to the island coupled with destructive fishing practices led to severe degradation of the fishery resource that eventuated in the initiation of fisheries co-management through a marine conservation project (Katon *et al.*, 1997).

The adoption of western management concepts has also played a major part in changing fisheries management practices. These were introduced during the colonialization period or in the subsequent era of modernization/industrialization (Makino and Matsuda, 2005; MRAG, 2005). Colonial era fishery institutions were centralized to improve taxation or rent extraction from fisheries, but this was often coupled to an emphasis on management of the resource for future use. An important feature of the western management paradigm was the concept of “public trust”, where the government or State was considered to be responsible for the management of common resources such as forests, seas and rivers, on behalf of the owners of the resource – the people. During the postwar period many national and international agencies emerged with the mandate for management of fisheries resources, based on sectoral models derived from western countries (Tietenberg, 2002).

A key aspect in this paradigm was that a top-down government driven scientific/economic approach provides better management of resources than the seemingly chaotic/*ad hoc* local management approaches. However, this was also during a period where marine resources were considered impossible to overexploit. The theory of open access to the resource and the tragedy of the commons that predicted that unregulated access to a common resource would lead to its overexploitation came at a stage when fisheries had already developed to the point of unsustainability (Hardin, 1968). Even as late as the 1980s and 1990s (and in some countries even up to the present), governments and their policies were still pushing for increased capture fishery production and fishery development.

During this modernization period, large-scale industrial fishing and motorisation of small-scale fisheries was also encouraged and expanded rapidly. Competition for resources and market driven development occurred to such an extent that one of the main management issues became the conflict between artisanal small-scale fishers and larger-scale fishers/fishing enterprises. Other “non-fisheries” uses for the resource, such as agriculture and aquaculture, have led to further depletion of production (WorldFish Center, 2003).

It is now generally accepted that both the local traditionally managed and the top-down government-managed models of fisheries management have in many cases failed, resulting in a worldwide crisis in fisheries (although some notable exceptions have been documented, e.g. Cunningham and

Bostock, 2005). Increasing competition for fisheries resources has resulted in reduced yields and unsustainable fishing practices. Especially in developing countries, there is clear evidence to show that although the total catch from fisheries may have increased, the value and productivity of the resource has declined. In demersal fisheries, the trend has been to fish down the food chain targeting smaller “trash fish” species for production of animal feeds (Sugiyama *et al.*, 2005; Funge-Smith, Lindebo and Staples, in press). In pelagic fisheries, heavy fishing combined with fluctuating environmental conditions have often led to dramatic declines in catch. In many fisheries, both small-scale and large-scale, a common trend of a decline in catch per unit of effort has occurred.

As a result of these failures, there has been a recent trend for governments to move back to incorporating communities and resource users in the management of fisheries – a system now recognized as co-management. This acknowledges that both governments and stakeholders have a role to play. However, because of the large perceived costs involved and insufficient human capacity in many developing countries, co-management approaches have largely been undertaken as pilot level activities by donors and governments. Whilst there have been some localized successes, there have been problems with upscaling and all too frequently success has not been sustained after project funds have been removed. Whilst it is often necessary to develop approaches through pilot activities, this also emphasizes the need to work in a realistic environment with the resources actually available and to avoid creation of artificial (or “subsidized” systems) that cannot be sustained.

The introduction of decentralized policies in many countries has provided the opportunity to “mainstream¹” co-management away from local, pilot-scale activities and the potential for national programmes with full-scale involvement across broad geographic areas (Pomeroy and Berkes, 1997; WorldFish Center, 2003).

1.2 What do we mean by co-management?

Co-management is the sharing of decision-making and responsibility for the management of resources between the community (local fishers) and government centralized management.

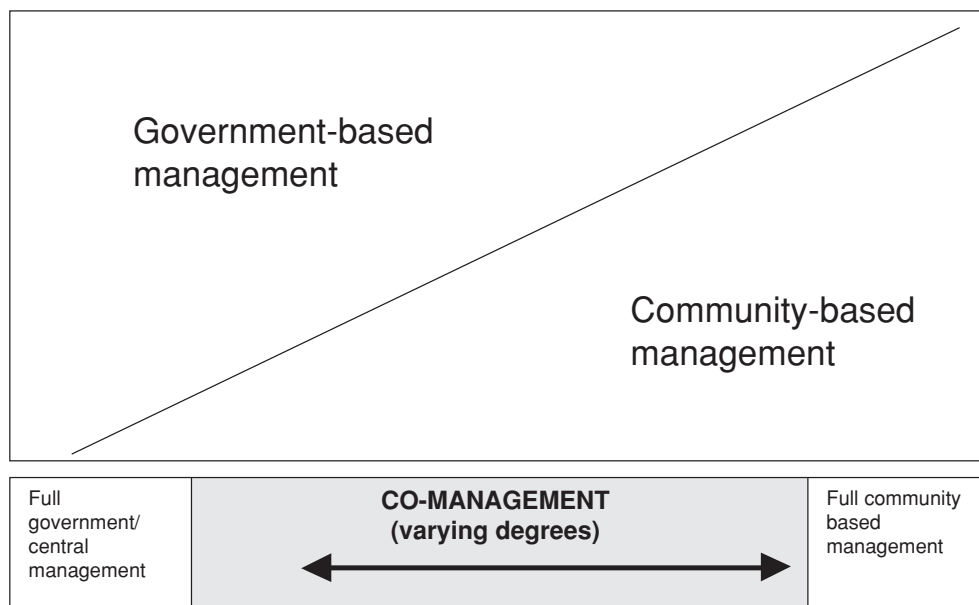


Figure 1. The relationship between co-management, community-based management and government-based management (adapted from Pomeroy and Berkes, 1997)

¹ In the sense that co-management moves from pilot projects to becoming the main form of fisheries management in a country

Co-management describes the spectrum of shared management between the extremes of full community-based management (with full devolution of responsibility to communities/fishers) through to government-based management (with full responsibility controlled by government) (Figure 1). In this review, the terms “community-based management” and “government-based management” refer to the two extreme ends of the spectrum, recognizing that these extremes rarely exist in reality and that typically there is some form of intervening arrangement. The term co-management therefore represents the varying degrees of involvement/interaction of government and fishers between these two extremes.

Although the principles for co-management are essentially the same within large-scale industrial fisheries and in small-scale artisanal fisheries, the policies and modalities for implementing them may differ. Co-management is not just a concept that involves the rural poor and local communities, but must incorporate all types of fishing and impacts on the resources. Having good stewardship of coastal resources by local communities that are then exploited by larger vessels from other localities is counterproductive and will inevitably lead to the breakdown of the system.

1.3 Who are the major players in co-management?

Governments, as major players in co-management, must be involved at all levels – national, “district” and local. The main government player is often the Ministry responsible for fisheries (often part of a larger Ministry of Agriculture) with links from the Minister – Ministry – Department – District office etc. as well as other relevant Ministries, such as the Environment Ministry. The other major players are, of course, the fishery stakeholders, especially those involved in the harvesting of the fish. Other partners working with fishery stakeholders such as Civil Society Organizations (e.g. NGOs, fisher’s organizations and federations) also play an important role. Co-management may also involve other users of the fisheries resource or environment (such as the tourism/industry). In many industrialized countries there have been attempts to involve large-scale fishers in management, through organizations representing their interests being involved in dialogue with governments. In countries with significant artisanal or small-scale fisheries, there are a greater number of organizations which may in turn increase the complexity of the co-management system.

The typical major players who have a stake in decision-making on matters that relate to fisheries resources are shown diagrammatically in Figure 2. This has been further elaborated during the recent Asia-Pacific Fishery Commission (APFIC) workshop on “Mainstreaming fishery co-management” (FAO, 2005).

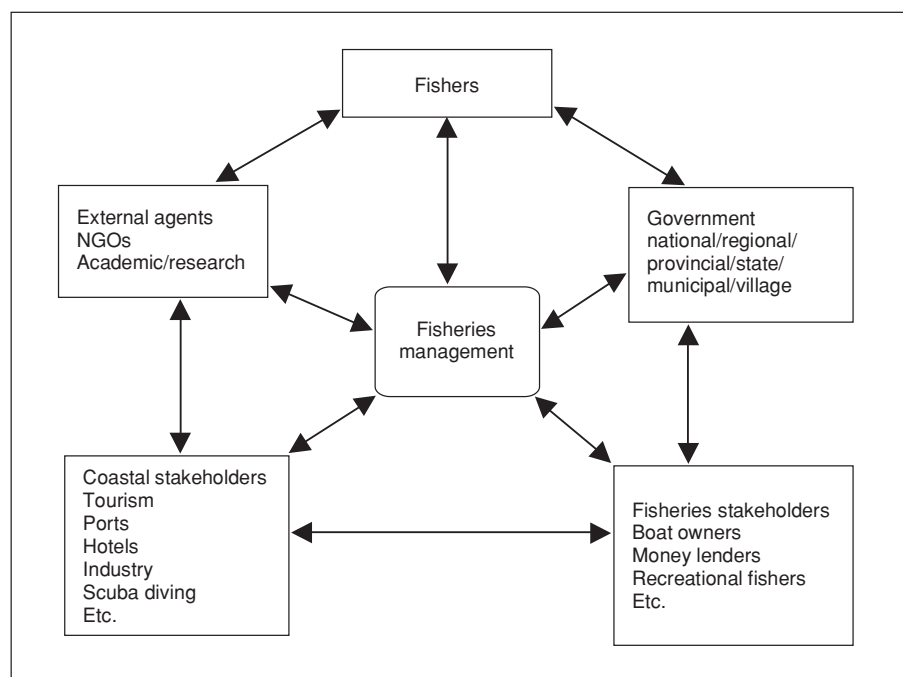


Figure 2. Key players in co-management (Pomeroy and Berkes, 1997)

1.4 Roles and responsibilities of major players

The roles and responsibilities of the major players, as identified above, are often not clearly defined or understood by the players themselves. As part of the co-management process, it is essential that the major players sit down regularly and define their and other's roles and responsibilities. As a guide, the Asia-Pacific Fishery Commission (APFIC) Workshop on "Mainstreaming fishery co-management" (FAO, 2005) developed roles and responsibilities for seven groups of major players (Table 1).

Table 1. Co-management players: roles and responsibilities

Players	Role and responsibilities
<p>GOVERNMENT AND ITS INSTITUTIONS</p> <ul style="list-style-type: none"> - Central/national/federal - Provincial/regional/state/local 	<p><i>At the national level:</i></p> <ul style="list-style-type: none"> - Provide an enabling environment through the specification of policy and legislation - Technical support/advice/human resource development - Empowerment, incentives, equity - Facilitate a participatory process/partnership - Ensure linkages - Standard-setting - Quality control, trade and market support <p><i>At the local level:</i></p> <ul style="list-style-type: none"> - Execute policy; implement management plan and measures; issue local administrative rules, regulations and ordinances; coordinate with other sectors; local project planning
<p>FISHER INSTITUTIONS</p> <ul style="list-style-type: none"> - Communities - Groups - Organizations etc. 	<ul style="list-style-type: none"> - Local planning and implementation - Custodian/stewardship over resources - Sustainable exploitation of resources - Formulation/observance of local rules and regulations - Conservation and resource enhancement - Participation in objective-setting and planning - Facilitate participatory process/partnership - Involvement in national/regional processes
<p>INDIVIDUAL FISHERS (not included above)</p> <ul style="list-style-type: none"> - Individuals - Groups outside formal systems - Migrants - Etc. 	<ul style="list-style-type: none"> - Stakeholders in that they use the resources and are expected to follow management interventions, - Maybe "outside" formal arrangements but still need to be considered/involved
<p>PRIVATE SECTOR</p> <ul style="list-style-type: none"> - Small-scale entrepreneurs - Larger-scale/industrial 	<ul style="list-style-type: none"> - Involvement in terms of upstream and downstream linkages

Table 1. (continued)

Players	Role and responsibilities
FACILITATORS AND SUPPORT GROUPS – IGOs and international agencies – NGOs-international, local – Trade unions – Advocacy groups	– Financial support and pilot implementation of projects – Capacity building – Advocacy – Linkages – Extension and pilots – Standard-setting
MEDIA	– Means of awareness, information flows/exchange

At the national level, the role of government was seen as one of providing an enabling environment through broad specification of policy and legislation, and the provision of technical support, advice and human capacity development. These policies are then to be implemented at the local level through management plans, local administrative rules, regulations and ordinances. It was also felt the central government had a major role to play in supporting empowerment of the resource users, promoting equity and providing incentives to implement policies.

The role that fisher communities, groups and organizations play was also highlighted. As a major partner they are also responsible for participating in local planning and implementation (especially the setting of management objectives), formulating and observing local rules and regulations and be able to represent their institutions at the national/regional level. The role of individual fishers (not included in the role of fisher institutions), the private sector, facilitators and support groups, media and academic/research/training institutes are also laid out in Table 1.

The table also gives a good guide on the skills and human capacity needed by each of the major players. It is important to note the number of roles that require good interpersonal skills and conflict resolution abilities, as well as the more traditional skills and experiences often associated with training in the more government-based fishery management regimes in the past.

2. The four pillars for successful co-management

There is extensive documentation covering the lessons learnt in trying to implement co-management (Katon *et al.*, 1997; Kalikoskia *et al.*, 2002; Pomeroy and Berkes, 1997; WorldFish Center, 2003; Stern *et al.*, 2002). Katon *et al.*, (1997), for example, identified thirteen characteristics of successful co-management institutional arrangements (Box 3).

An analysis of these lessons learnt shows that the problems faced by those implementing co-management programmes are usually variants of the “generic” problems that face all types of common resource management, although manifestations of these are often very specific to cultural and socio-economic contexts on particular cases (Stern *et al.*, 2002).

These issues and lessons learnt can be categorized under four main pillars for the successful co-management of fisheries:

- 1) An enabling policy and legal framework;
- 2) The participation and empowerment of communities (and other users);
- 3) Effective linkages and institutions; and
- 4) Resources – a resource worth managing and the people and money to do it.

Box 3 Thirteen characteristics of successful co-management institutions

1. Existence of a resource availability problem.
2. Specification and enforcement of property rights.
3. Influence of fishers on project planning and participation by those affected.
4. Supportive local leadership and cooperation among fishers.
5. Knowledge of project objectives.
6. Positive attitude toward rules.
7. Presence of legal and policy support.
8. Community cooperation.
9. Job satisfaction of fishers.
10. Dependence on fishing as the most important source of total household income.
11. Tangible benefits from co-management arrangements.
12. Built-in monitoring and evaluation schemes.
13. Reinforced incentives to collaborate.

Public acclaim for achievements in fisheries management is instrumental in reinforcing the commitment of the fishing community and the municipal government to sustain project initiatives and enforce fishery rules.

(Katon *et al.*, 1997)

There are many examples both globally and within Asia where one or two of these pillars are in place. However, it is difficult to find examples where all four are firmly “mainstreamed” into the country’s economy and social structure. In Asia, Japan is possibly a unique example where all four exist. The challenge for other countries is to address the issues under all four pillars and commit to a functional form of co-management.

2.1 Enabling policy and legal framework

Policy provides the overall framework for managing the sector through the specification of goals and objectives, and in many cases the related strategies and actions to achieve these goals. Legislation is the formalization of these policies into the legal system of the country, and enshrining them in law.

At its broadest level, legislation must recognize and support the authority of the State as the agency responsible for fishery management. This is known as the “public trust doctrine” which is based in common law in many western countries and empowers the State as the agency responsible for common property resources of a nation. Examples of this include air pollution, water resources, fisheries, forestry and minerals (Tietenberg, 2002).

This authority allows the State to assign rights to individuals or groups. This forms the basis for laws and regulations that relate to many aspects of a fishery using a range of fishery management interventions (the manager’s tool box) including the allocation of uses and users (permits and quotas), enforcing the laws and regulations and the promotion of management plans and objectives.

Co-management must be backed up with ways and means (incentives and deterrents) to implement policies and laws. For small-scale fisheries, success of co-management depends on the ability of users at a local level to devise rules for access to and maintenance of the resource. Importantly,

a sanction must be effective (and understood as so) to prevent rule-breaking behaviour. For an example see Box 4.

Box 4 One of the key characteristics of successful co-management in San Salvador, Philippines was the presence of legal and policy support with vigorous enforcement

In the case of San Salvador, the Masinloc municipal government filled this role. Eventually, the government-organized marine guards (*Bantay Dagat*) and village police (*Barangay Tanod*) also assisted in patrolling the coastal waters of San Salvador. Co-management efforts resulted in an actual imposition of sanctions against violators of fishery-related laws, higher rule compliance, and reduced incidence of community conflicts. Over time, other supportive policies and legislation came into existence, both from the national and municipal governments.

In 1991, the enactment into a national law of the Local Government Code (LGC) formalized the devolution of powers and responsibilities for coastal resource management to local governments, which created a favourable environment for co-management to prosper. Among other provisions, the LGC also supported the active participation of non-government organizations in community development. In 1993, the national government declared Masinloc Bay as a protected seascape. This resulted in the formulation of a management plan and the zoning of the bay into various management zones in 1996. It also reinforced the status of the San Salvador sanctuary as a protected area.

At the local level, the Municipal Council of Masinloc enacted its Basic Fishery Ordinance in 1995, which affirmed the extent of its municipal waters, declared as unlawful any commercial fishing within its waters such as air bubble fishing (*pa-aling*), *muro-ami*, and Danish seine (*hulbot-hulbot*), and required the issuance of permits and licenses for the capture, use or culture of fishery and aquatic resources, among others.

(Katon *et al.*, 1997)

For large-scale fisheries, the same principle of stakeholder ownership of rules and regulations apply. Experience has shown that Monitoring Control and Surveillance (MCS) schemes based on enforcement and a “big stick” approach are very difficult to apply, especially in remote areas where “cheating” is relatively easy and is generally not punishable.

Experience has shown that following key factors in relation to national policies and institutions are important in successful co-management of fisheries:

1. Willingness of governments to initiate legislative and policy change: In most circumstances, the change from a top down/centralised approach to a co-management approach requires changes in laws and the development of new laws. This can take considerable time and needs strong political leadership.
2. Coherent policy and legislation that are mutually supportive: Are required to create the enabling environment for co-management. For example, see Box 2 Tonle Sap. This must apply to both small-scale and large-scale fisheries and should be closely linked to any decentralization policies of the country.
3. Authority and roles: It is essential to define clearly the role and function of government, Civil Society Organizations (CSOs) and private sector organizations, along with clear specification of the boundaries of co-management areas. In addition, the clear assignment of property rights (ownership) is considered vital. Without clear property/access rights, investment in development of resources will be difficult.

4. Shift responsibility for decision-making and action away from a central agency: In order for co-management to succeed, administration needs to be deconcentrated, clear delegation given to local players and some power must be devolved from central government to agencies or individuals involved in co-management. Privatization may be an appropriate way to transfer certain government functions to individuals and corporations.

2.2 Empowering communities

In keeping with our focus on both large-scale and small-scale fisheries communities, we refer here to communities as a set of people (or agents in a more abstract sense) with some shared element. For small-scale fisheries, a community is a group of people that live in the same area. For large-scale fisheries it is the fishing industry group, normally based on a type of fishing (e.g. the trawl industry, the tuna industry). In some cases, they will be organized (e.g. trawler boat owner association, fishers federation etc.) but need to become partners with government in fisheries management.

Based on the enabling legislative and policy environment, power and authority need to be actually devolved to user groups. Further, the government must support the emergence of local organizations and their empowerment. Under co-management regimes local co-management organizations must, for example, be free to develop and to hold meetings when they want, and to be able to question and comment on government policy. Government officials must be accessible to the fishers and be willing to listen and learn. The fisher's organizations must be allowed to form their own institutions (rather than take part in government sponsored ones) and develop their own rules, subject to any legislation or policy specifying the extent to which such rules can be developed in the face of other national government policies and legislation.

In order to empower communities successfully, participation and participatory approaches can be used to actively involve people and communities in identifying problems, formulating plans and implementing decisions. These approaches are often seen as a set of principles for generating insights about people and the communities in which they live. Participation for empowerment must be seen as a process. The process of continued, active stakeholder involvement in activities will result in sustainability of impact, a greater sense of ownership and agreement of the processes to achieve an objective, better targeting, accountability and equity.

Ownership of any rule or regulation is essential if any degree of compliance is going to be achieved, and for that community empowerment is essential. Communities may require the backing of government to settle some conflicts and dispute and, importantly, have access to an arbitrator.

Experience in several projects carried out in a number of countries has shown that for empowerment to be effective it must be carried out holistically. A narrow approach to empowerment with a single aim to get better fisheries management is not a practical option. Talking about conservation of resources in situations where communities are wholly dependent on fishing in order to feed their families and raise enough income to survive is counter-productive. Instead, they need to be empowered to the extent that they are in a position to analyse their situation, look for alternatives and initiate preparatory actions to address some of their immediate concerns before tackling issues of resource use. These include helping them out of their current state of hopelessness, uncertainty, social deprivation, inner conflicts, sense of insecurity and isolation, dependency etc. Their concerns are multifold and as such a broad-spectrum or holistic approach is needed for their empowerment covering wide-ranging areas from organizing the communities to strengthening their organizations and facilitating various community development activities covering sanitation and drinking water, primary health care, primary education, disaster preparedness, microfinance and also natural resource management which are directed and implemented by their organizations.

It is only when human well-being has improved sufficiently that any progress to improve ecological well-being can be tackled. A good example of this type of approach is an FAO/UNDP coastal community empowerment project being carried out in southern Bangladesh. Through the formation of village organizations (both women's and men's organizations), the project assisted in improving basic cleanliness, provision of multipurpose village resource centre cum school buildings, salary of teachers, training of health focal points, training of village-based natural resource conservation/management activists, training in safety at sea and the initiation of savings. Most of these provisions have been made on matching support basis. Subsequently, it was possible to form a network of village organizations at subdistrict and district levels. It was through these organizations that decisions to increase mesh size and remove destructive gears such as shrimp fry catching nets was possible. The communities also built up enough confidence and capability to interact better with both local and central government. A key to this success was the grassroots level involvement of local fishery officers from the Department of Fisheries as well as project staff.

Water bodies are typically multiple user resources, which further complicates co-management in fisheries. When other users are included in water resource management or environmental management decision-making (such as other fisher groups, tourism, industry and agriculture), agreement on management priorities becomes complex and it is necessary to facilitate processes to reach consensus.

For example, recent government support to co-management in the Tonle Sap shows how the government followed up policy change with commitment to develop fishers groups. Some key steps in the empowerment of these communities were: (i) organization/mobilization of people; (ii) development of associations; (iii) inclusive involvement of people (ensure marginalized groups are involved); (iv) human capacity building; (v) delegation of responsibility; and (vi) participatory planning. This management system aims to achieve a balance between the needs of forestry, fisheries and agriculture (Box 2) (Evans *et al.*, 2004).

2.3 Linkages and institutions

As shown in Figure 3, the network of stakeholders is complex, both in terms of vertical linkages (national to local), horizontal linkages (between different users of the natural resources) and in terms of geographic coverage. Communication and information exchange throughout the network is critical for success. But what information is needed by the different players and in what form? Much more work is needed to determine what the information needs are and how to manage this huge amount of information.

Institutional arrangements, both in terms of how the players will be organized and the rules and regulations governing their activities must be set up and understood by all. For example, in many cases decentralisation of management also allows a limited decentralisation of fiscal authority giving the management agency the authority to collect revenue/recover costs towards a management of the fishery. The local management agency may have the right to employ enforcement officers or to pursue offenders through the courts. This becomes more complex where a fisher's group is responsible for patrolling, since a decision must be made as to whether they are empowered to apprehend fishers that are contravening local regulations and whether this applies to only their members or members of the public.

In order to facilitate dialogue and communication, success in co-management must be defined. Success criteria, priorities and management objectives vary between stakeholders, a diversity that must be understood and respected. A key question that must be answered by the players in a co-management system is "what is co-management trying to achieve?". These different objectives might relate to economic, biological/resource, social or environmental ideals and cultural norms. For example, management may be undertaken to maximise economic return from a fishery or it may be

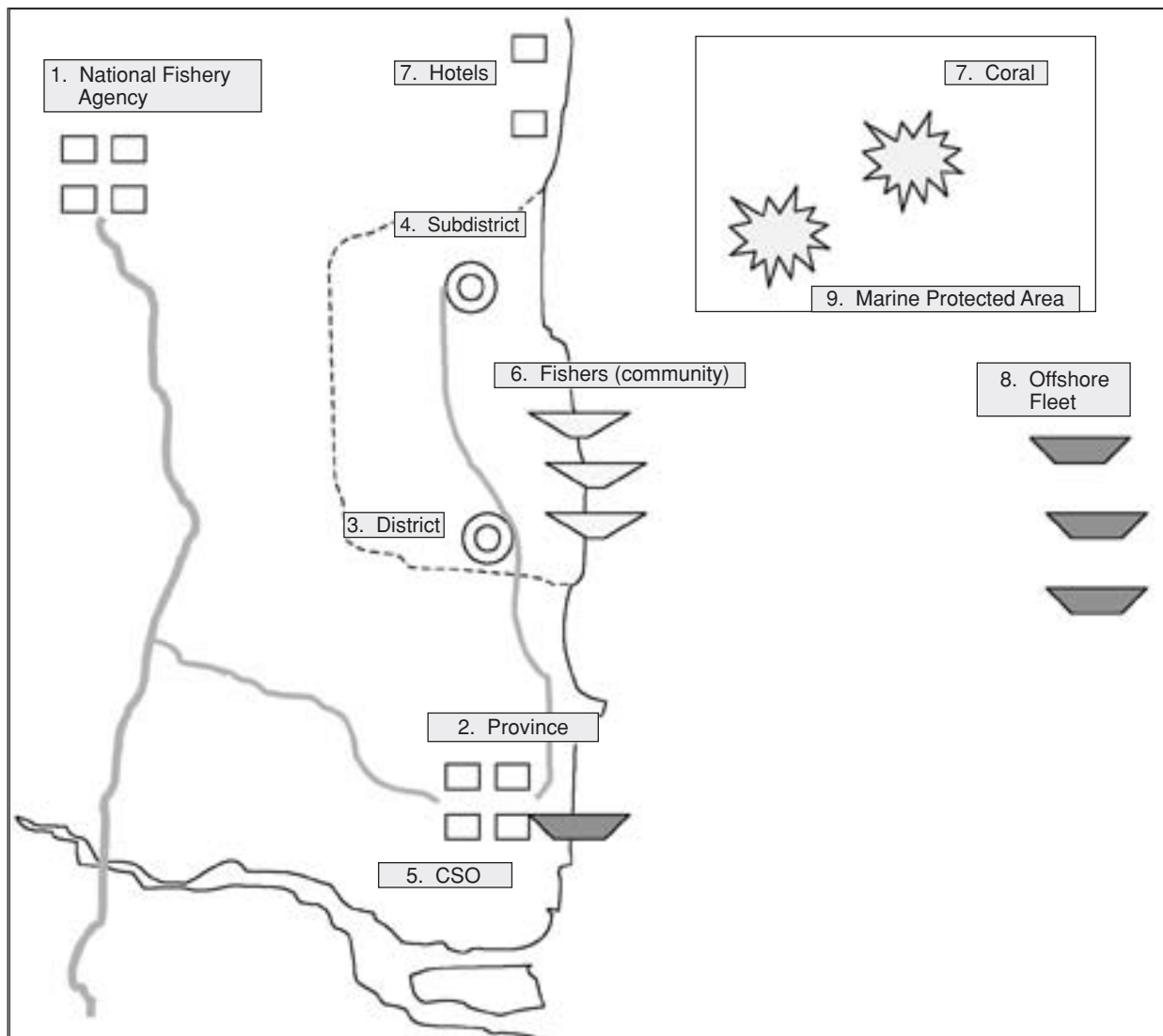


Figure 3. Typical network of relationships between players in a co-management arrangement:
1) National/central (often in national capital), 2) Province, 3) District, 4) Subdistrict,
5) Civil Society Organizations (NGOs/CBOs), 6) Fishing communities, 7) Other stakeholders
(e.g. tourism), 8) the offshore fleet, 9) Marine Protected Area.

to allow it to act as a social safety net (providing economically low value fish) for the poor. Reducing overexploitation of resources is often a main objective, but whilst this is important, it is not the only issue for resource users. Livelihoods and well-being are also important. Trade-offs may have to be made between efficiency, sustainability and equity. Models for co-management must take into account the many different values and ideas that stakeholders have about the desired outcomes. In other words, fisheries management must strive to promote the contribution that a fishery makes to sustainable development by balancing the ecological well-being with the human well-being of the dependent communities in a way that promotes the best balance for long-term sustainability.

A key issue for successful (and sustained) co-management in small-scale fisheries is compliance with locally agreed rules and regulations relating to access to the resource. A possible reason why coastal community-based management has been so difficult to achieve/sustain (apart from the “pilot nature” of project interventions) is that the resource can be mobile and is dispersed over a large unenclosed area. Many pilot co-management initiatives deliberately choose locations that have a degree of enclosure such as bays, or that are geographically identifiable such as reefs or rock

Table 2. Description of the elements of a co-management system

Level	Description	Functions	Other agencies/groups (indirectly) involved	Skills/capacity development required
National Agency Responsible Fisheries	<ul style="list-style-type: none"> – Fishery Department – National advisory committee on co-management 	<ul style="list-style-type: none"> – Review and amend legislation if necessary – Review and amend policy if necessary – Link with RFOs/donors/(I)NGOS – Links with other government department – Direct co-management research activities required – Budget allocation – MOU/Agreements between related agencies 	<ul style="list-style-type: none"> – National fishers federation – Ministry of Natural Resources and Environment – Ministry of Investment and Planning – Ministry of Finance – National Rural Development Agency – National Law and Enforcement Agency – Bureau of local government – Coordinate on financial support – Fishery research institutions 	<ul style="list-style-type: none"> – National level advisory committee – Basic concepts of co-management – national workshop (once off activity); literature esp. on success stories – Needs of the grassroots level; awareness of local issues
Provincial/State Advisory Committee	<ul style="list-style-type: none"> – Provincial fisheries department – Provincial co-management unit/committee 	<ul style="list-style-type: none"> – Approval of mgt plans coming up – Guidance on developing mgt plans going down – Monitoring and evaluation of co-mgt 	<ul style="list-style-type: none"> – Other provincial departments (part of provincial co-management committee) 	<ul style="list-style-type: none"> – Concepts on co-management – Legal aspects of management – Planning & monitoring – Local issues – Conflict resolution – Training of trainers

Table 2. (continued)

Level	Description	Functions	Other agencies/groups (indirectly) involved	Skills/capacity development required
Middle-level interface	<ul style="list-style-type: none"> - Subdistrict/district level; - possibly multi-sectoral; "co-management organization" 	<ul style="list-style-type: none"> - Development of district mgt plans - Implementation of district mgt plans - Request specific advice 	<ul style="list-style-type: none"> - Enforcement staff - Local government administration - NGOs 	<ul style="list-style-type: none"> - Concepts of co-management - Awareness of local issues - Conflict resolution - Organization & training of users - Training of local district committees - PRA, institutional strengthening, formulation of management plans, group mobilization/dynamics, social savings, livelihoods <p>Note: Approach as LEARNING (learning by doing, exchange visits etc.)</p>
Aggregations/ Federations of villages/communities	<ul style="list-style-type: none"> - Federations of village groups - (e.g. waterbody level; "community-based") - District Community (Fishery) organizations - District level representatives of users 	<ul style="list-style-type: none"> - Represent members at meetings with middle-level interface 		<ul style="list-style-type: none"> - Concepts of co-management - Awareness of local issues - Self-organization for representation of members - Conflict resolution and mediation
Local level/ communities	<ul style="list-style-type: none"> - Village level groups ("community-based") - Possibly with occupational or gender subgroups 	<ul style="list-style-type: none"> - Development of local mgt plans - Implementation of community mgt plans 	<ul style="list-style-type: none"> - NGO/co-management facilitating organization 	<ul style="list-style-type: none"> - Users - Local level association – needs training; same as that of district level <p>Note: Should be seen as LEARNING (learning by doing, exchange visits etc.)</p>

outcrops, since this facilitates the definition of boundaries and therefore access. Unfortunately, this may constrain subsequent up-scaling to areas that lack such clear boundaries, particularly straight stretches of coastline and open waters. Without involvement of other users of the fishery resource (typically the larger industrial-scale fishing operations), any local consensus may not be effective. In many circumstances, a network of committees will be required with representatives of different stakeholders involved at different levels.

2.4 Resources – people and money

Understanding the economics of fishery co-management is critical to its success. Management of any fishery (whether community-based, co-managed or government-managed) will require inputs in terms of resources. In the central government model of fisheries management, these resources included financing for research, monitoring, compliance and surveillance (enforcement) and maintaining local, national and international institutions (these could be community-based such as associations, trader associations or national such as fishery departments and police and include human capital, or international organizations such as FAO and APFIC). An important aspect of sustaining stakeholder interest in being part of a co-management arrangement is that the resource that is to be co-managed is actually worth managing. This means that the value of the resource to the stakeholders is sufficient to justify the investment of time and financial resources that is required under a co-management system. This is an important consideration, since there may be local interest to manage a fishery resource and the willingness to invest time and effort to do so, but the commercial value of the fishery and the opportunity of cost recovery is so low that the government does not find it viable to support.

The top-down management systems which have come into prevalence since the 1950's traditionally attempt to recover cost through: taxation or levies on the produce (either on landing or during processing); quotas (either for access to an area, for species, gear, time); or general taxation. Financial aspects of fisheries are gaining increasing recognition, and there have been recent moves towards greater "market discipline" in the sector as a way of contributing towards a transition to responsible fisheries, as evidenced by recent focus on issues such as: withdrawal of subsidies; strengthening of use rights; substitution of grants with loans; and cost-recovery programmes and greater emphasis on capture of resource rents. In this context there has been concern that the resource rent/revenue recovered from co-management schemes does not cover the management costs. For example, in the United Kingdom it is estimated that 20 percent of the gross value of the fishery is spent on monitoring alone. The fishing industry has in this case received special status because of its perceived social importance to communities.

However, for co-management to work, the investment in time, resources and capacity building to ensure successful co-management cannot be underestimated. In cases where a network of committees is established to cover both the hierarchy from national to local and the different stakeholders, costs both in terms of travel, as well as time away from the source of people's income and livelihoods, can be very demanding and few incentives for participation exist, especially when the participants lose out in any allocation or negotiation.

According to Kuperan and Pomeroy (1998) transaction costs can be classified as: (i) information costs (costs associated with acquiring knowledge of resources and organizations); (ii) collective fisheries decision-making costs (costs involved in setting up meetings, agreeing on policies and rules, communicating decisions and coordinating stakeholders); and (iii) collective operational costs (compliance costs, resource maintenance and resource distribution costs). Makino and Matsuda (2005) calculated these costs in one district (prefecture) in Japan. They showed that the total costs corresponded to about 27 percent of the total annual fisheries production, 70 percent being paid by

the government and 30 percent by fishers. They pointed out that in this system, however, compliance costs were very low and the largest share of the government's cost goes to information costs. It would be interesting to compare this with the top-down central approach which has large enforcement budgets and large research budgets, with researchers often not doing work that is especially relevant to better management.

Although the costs may appear high, these have to be related to the benefits. The benefits themselves are in terms of lessened conflicts, increased social cohesion, more independent communities, not to mention the large economic and social gains that are possible to recoup from healthy fishery resources, as well as increased nutrition and health. The cost of not investing in co-management is potentially enormous, and with current trends in Asian fisheries both the economic and social impact of collapsed fisheries could cost governments many times more than strategic intervention taken now.

3. Mainstreaming co-management

3.1 Benefits of co-management

Although co-management has been picked up to some or other extent in most APFIC countries, there has been very little advocacy for introduction of the approach as a national initiative. Community empowerment has been demonstrated time and time again (e.g. Pomeroy *et al.*, 1997) to be a very positive social change and in some cases has resulted in improved natural resource management. What are the benefits and why attempt to do it, knowing that it is a complex process that takes time and resources. There are, of course, many benefits, but perhaps the largest incentives come from thinking about the consequences if it is not attempted.

The rapid changes in the fisheries in Asia-Pacific over the last 20 years certainly suggest that as we "fish down the food chain" there are fewer links in the chain that would provide direct human food. The social implications of this type of decline are enormous. If the "safety net" function of small-scale fisheries is removed, where will the millions of people move to and what will they do? They will probably be forced to move to urban areas, aggravating the already large problems in the region's mega-cities. As a poverty reduction strategy, fisheries co-management has enormous potential and there is a clear need for greater advocacy of the approach.

One of the apparent perceptions that needs to be overcome is that co-management is a challenge to government authority and that this ought to be resisted. Experience to date, however, has shown that when governments do devolve authority they benefit by achieving better results in terms of ecological, social and economic outcomes. Under co-management, resource users will get the benefit of participating in management decisions that affect their welfare and governments will benefit by being more effective and efficient, and potentially damaging conflicts, poverty and resource degradation can be avoided, or at least mitigated.

3.2 Key issues

In considering mainstreaming of co-management there are some key issues which must be addressed:

- 1) How do we get governments to buy-in to co-management in a sector that appears to be a minor player in terms of GDP and able to cope with its own poverty and problems?
- 3) What should be the roles and responsibilities of all the major players in co-management?
- 4) What powers and functions can be entrusted to local institutions?

- 5) What is the role and relationship of governments with non-government organizations and civil society organizations?
- 6) How do we empower large numbers of communities over large areas to be legitimate players in fisheries management?
- 7) What are the most appropriate roles for organizations at different scales of co-management and can these be effectively linked across those scales?
- 8) How do we build the necessary human capacity at all levels, but especially at intermediate district/subdistrict levels?
- 9) What are sustainable financial models of co-management, and can these be generalized at all?
- 10) To what extent can/should co-management be supported by donors, and what form should this support take so as to maximize the potential for sustainability once interventions have finished?
- 11) Should co-management initiatives be focusing more on non-fisheries specific skills required, rather than sectoral specific knowledge, e.g. a greater focus on communications and conflict management skills rather than, for example, stock assessment?
- 12) How can communication and participatory research be used to support co-management when we have imperfect knowledge of the resources?
- 13) How can co-management institutions be designed to have enough flexibility to adapt to change (for example, when new resource users arrive, priorities for resource users change or new incentives appear)?

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