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## Community based management of small scale fisheries in Asia: Bridging the gap between fish supply and demand

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## ABSTRACT

Production from capture fisheries saw rapid, sustained growth from the 1950s through the 1970s, but by 1990s global capture fisheries has become stagnant, warranting a sustainable approach to its exploitation. With capture fisheries stalling and demand for fish growing, many countries turned towards developing the aquaculture sector to meet the supply gap. Over the decade, the expansion of aquaculture has led to a rapid growth in fish production. However, as aquaculture expands its production, its use of capture fisheries as food for farmed fish will increase, taking count that currently nearly one-third of the world's wild caught fish is consumed as fish feed. As aquaculture in the developing world continues to exhibit steady growth in production, sustainability of this trend is now open to question given the rapid degradation of the capture fisheries. Establishing community organizations for managing fisheries is a promising means of improving the resource condition, particularly for countries with large inland and seasonal floodplains. However, as the paper outlines, this arrangement should not reduce the role of the government, but emphasizes on delivering net benefits. Also it is necessary to set up legal framework for community based management as to ensure and sustain community participation in fisheries management.

## INTRODUCTION

The last 50 years have witnessed paradigmatic shifts in fisheries management, both in terms of balance between overall goals and balance in the distribution of authority and power (Siar et al. 2006; Jentoft and Mccay, 2003; Hanna, 2003). This was brought by the gradual shift of view from fish as an inexhaustible resource and the freedom to fish anywhere and anyhow in the 1950s to the realization of rapidly declining fishery resources in the 1970s to the concept of the world's oceans as "common heritage of mankind" in the 1980s. As views changed, fisheries management policies also shifted from favouring the state as the resource managers to market orientated management through Individual Transferable Quotas (ITQs), which sets the limit to individual fisher and fishing firms on the amount of fish that may be taken from the fishery in any one year.

However, in the context of Asian developing nations, this form of management never took off. This is due to the fact that in the Asian developing countries alone, almost 65 percent of the world's fishers, framed as the poorest of the poor, continue to depend on fish for food and livelihood survival. Most are small scale fishers who catch fish in near shore waters and inland water bodies and rely on labour intensive fishing technologies (The WorldFish Center 2005). The over populated fishing industry, coupled with poverty issues and open access characteristic of water bodies, made ITQ as an impossible management tool.

In many of these poor developing nations, their policy makers opted towards developing aquaculture and imposed legislative changes which focused on regulation and enforcement to control fishing efforts. However, this has failed to prevent over-exploitation of fisheries resources. Pomeroy and Viswanathan (2003) pointed out that most of the coastal and inland fisheries in Asia are still over-fished.

It is argued that the failure is because this form of management is very much still a centralized top-down approach, focusing on objectives relating to fish resources and based exclusively on formal biological science (Viswanathan et al. 2003) and mostly disregards the experiences of fishers (Degnbol 2003). As a result, the modern laws and regulations that have been put in place to manage fisheries, has not been well received by resource users, leading to the violation of these regulations by fishers whether they are industrial, medium scale or individuals fishing for their daily food and income and failure of the government to enforce the regulations due to a lack of resources (Kuperan and Sutinen 1998).

Subsequent recognition of the failures of exclusively government managed fisheries led some of the governments to explore co-management and community based management as options to improve fisheries management. However, a key constraint lies in creating institutional arrangements that can sustain community participation to ensure the benefits really reach the poorer sections of the community and that it is done in a sustainable manner.

This paper looks at the broader governance approach needed to sustain community participation in fisheries management, with an emphasis on developing Asian countries. This is seen through the role of the government in delivering net benefits and the need to set up legal frameworks for community based management.

## FISH SUPPLY AND DEMAND IN ASIA

The supply of and demand for fish have changed dramatically during the last three decades. Global demand for fish has risen rapidly with rising populations and increasing per capita income. The rise in demand has been met by a rapid growth in production and increased global trade. Asia is the leading contributor to this expansion accounting for over 63 percent of total fish production, and as much as 90 percent of all aquaculture output (FAO 2006).

During the 1950s and 1960s, capture fish production in Asia increased by an average of 6 percent per annum but this declined to 3 percent during the 1970s and 1990s (FAO 2006). In contrast to the declining growth in capture

fisheries, aquaculture in the region has been growing rapidly, by about 10 percent per year during the 1950s and 1960s to 9 percent during the 1970s and 1980s and over 11 percent since 1990s (FAO 2006). In Asia alone, aquaculture production growth boomed from 5.1 percent of total fish production in 1950 to 46 percent in 2003. It is easily one of the fastest growing food-producing sectors in the region, with production tripling from 11.8 million tonnes in 1990 to 40.1 million tonnes in 2003 (FAO 2006). The steady growth of aquaculture production has been billed as a means of taking up the production slack in capture fisheries for many of the developing Asian countries.

The last two decades have also witnessed substantial increases in per capita annual consumption of fish from all sources in various Asian countries (Dey et al. 2005). Globally, the annual average per capita fish consumption in developing countries has nearly doubled the level since early 1970s. In contrast, in developed countries it remained almost stagnant at 23.5 kg (Dey et al. 2005) since 1985. Given the high population growth in developing countries, especially in Asia, the increase in per capita annual fish consumption in these countries is worth noting. Dey et al. (2005) pointed out that fish consumption varies widely between economic groups. As income increases, the per capita annual fish consumption will also consistently increase. Projections for demand indicate rising aggregate consumption for all major developing Asian countries (The WorldFish Center 2005).

However, the continuing rise in the global population and demand, including export demand, coupled with a stagnation of production in global capture fisheries has given rise to concerns that fish production will be unable to meet future global demands. In 2005, it was estimated that about half of the marine capture fishery resources were fully exploited and the other one-quarter were either over-exploited, depleted or recovering from depletion and thus had no possibility for further expansion in the short or medium term (FAO, 2007) and will require time to recover. The continuous expansion from aquaculture is expected to fill the supply gap.

Despite the growing production of both low and high value aquaculture, there are concerns with this burgeoning industry. Among the issues, is that the rapid expansion of the aquaculture sector is placing pressure on capture fisheries. Primarily, this is seen through its increasing demand for captured-fish as feed. High value aquaculture that produces carnivorous fish and crustaceans has strong demand for these feed inputs (Delgado et al. 2003). Since, the relationship between capture fisheries and aquaculture is an interdependency relation to certain extent, restoring the capture fisheries resource base is a necessity.

One of the ways to do this is through improved fisheries policies and management systems.

## FISHERS AND FISHERIES

Fish producers are classified into capture fishers and aquaculture farmers. The former refers to persons who harvest from natural fish stocks, whether marine or inland, under open (or nominally restricted) access rights. The latter refers to persons who culture fish either in freshwater or brackish water ponds and cages, which are operated with full private ownership/rights. A grey area is culture-based inland fisheries, in which the natural productivity of the aquatic ecosystem is utilized, though fishers need to acquire access rights (to community tanks, ponds and reservoirs). In this system, fingerlings are stocked in communal ponds and fish harvesting is done collectively or individually.

An estimated 41 million people (FAO 2007) depend on fisheries for livelihood, in which capture fisheries account for 72 percent of the labour force. Fishing households involved in capture fisheries are found to be poorer and less educated than their counterparts in the aquaculture sector (The WorldFish Center 2005), with earnings as low as UD\$1 per day (Table 1).

Table 1: Average household income of aquaculture farmers and capture fishers.

Unit: US\$/year					
Country	Aquaculture Farmers			Capture Fishers	
	Freshwater	Brackishwater	Marinewater	Inland	Marine
Bangladesh	2,112	14,257	na	500	2,100 - 7,200
China	4,960	1,695 - 6,170	1,695 - 6,170	500 - 1,600	350 - 5,200
India	1,580	6,000	na	500 - 800	500 - 1,200
Indonesia	447 - 2,027	2,136 - 7,350	9,431	67 - 650	1,541 - 4,058
Malaysia	898	18,376	na	na	-
Philippines	na	5,892	na	na	7,090
Srilanka	2,907	-	na	1,128	1,128 - 3,000
Thailand	1178	37,485	4,836	400 - 920	2,242 - 11,800
Vietnam	120 - 1,230	2,500	na	na	1,500 - 5,000

Source: The WorldFish Center, 2005.

The relatively low socioeconomic profile results from the large number of fishers' dependant on the sub-sector and the dwindling catch. Most of the world's fish stocks are about 30 percent of the levels that existed a decade ago. Silvestre et al. (2003) indicated that fishers' daily catch has reduced

compared to few years back. Studies also indicate that the large number of coastal fishers involved in capture fisheries are more vulnerable to risk as most do not have any landed property, in addition to being exposed to catastrophic natural disasters such as the tsunami.

Clearly, there is an urgent need for do-able actions and workable policies to restore the state of capture fisheries, not only to meet the global demand for fish but to ensure a sustainable and improved livelihood for the huge number of poor relying on fish and fisheries. Considering that millions of poor people from the developing countries continue to depend on fisheries for their livelihood and food security -- rebuilding and improving the resource condition through sound and effective implementation of fisheries management definitely merits serious consideration. This daunting task is considered more serious in the developing countries of Asia given the sheer size of fisher population involved in fisheries and their complete reliance on the development of the sector for their livelihoods.

## CO-MANAGEMENT TO COMMUNITY BASED MANAGEMENT: THE WORLDFISH EXPERIENCE

In the late 80's, the WorldFish Center initiated a number of co-management experiments and pilot activities<sup>1</sup>. The activities centered on studying the delegation of management responsibility and authority between local-level (informal and customary) institutions and the state-level (national, provincial and municipal) institutions. Co-management fitted in as 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.

Ostrom (1990) pointed out that co-management is very advanced in that most of the vertical linkages between the fishing communities and local and senior levels of government needs to be institutionalized, so that the system is fully "nested" at all levels of governance. That is, decisions made at one level interact with other levels so that there is both policy stability at higher levels of governance and also capacity to innovate at lower levels (Pinkerton, 2003). Hence, at one point, for co-management arrangements to be sustained, it will be important to form formal functioning institutions at the grass-root level. Community members representing these "formalized"

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<sup>1</sup> One of the largest project implemented by the WorldFish Center, with the Institute for Fisheries Management and Coastal Community Development (IFM) and national research partners in Asia and Africa is the the Worldwide Collaborative Research Project on Fisheries Co-management (Fisheries Co-management, Phase 1 and Phase II, 1994-2003). The project documented the results and impacts of fisheries co-management by assessing the processes and models implemented at the national government and community levels in 17 countries, including Bangladesh. Phase I documented comparative case studies on co-management arrangements in different socio-political and cultural contexts. Phase II focused on the benefits, strengths, and weaknesses of the co-management approach in terms of sustainability, efficiency, and equity.

institutions will be more confident and assertive in establishing communication with the existing institutions at higher levels of governance.

In 1996, the Center began piloting community participation using institutional approaches under the Community Based Fisheries Management (CBFM) project in Bangladesh. While co-management centered on partnership arrangements between centralized government management systems and local institutions (informal, traditional, customary), CBFM looked at establishing formal institutional arrangements at the community level first with the help of local NGOs, supported by governmental agencies. This led to the establishment of fisher-led, community-led and women-led community based organizations to manage fisheries.

While there are many similarities between the concepts of co-management and CBFM, there are differences in the focus of each strategy. These differences centre on the level of participation of government, and on when the government becomes involved in the process. CBFM focuses on establishing and empowering local level institutions through community-focused approaches, with minor support from the government throughout the establishment and empowerment process. While co-management focuses not only on these issues but involves the process of establishing partnership arrangement between government and the local community and resource users, hence making CBFM a central element of any co-management arrangements.

## COMMUNITY PARTICIPATION: A BASIC ELEMENT FOR GOOD GOVERNANCE

Viswanathan et al. (2003) argues that the potential advantages of community participation in fisheries management include efficiency and equity. Community participation in management is more economical in terms of administration and enforcement than centralized systems. It involves self-management where the fishers take responsibility for a number of management functions, e.g.: patrolling during the fish ban season. Co-managed arrangements allow the community to develop a management strategy with higher probability of meeting local needs and conditions and are more legitimate in their eyes. This is because, community members understand their problems, needs and opportunities better than outsiders do.

In addition, management is usually accountable to local areas and not to larger regions. Through co-managed arrangements, fishers view it as 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 (Viswanathan et al. 2003). Community

members can enforce standards of behaviour more effectively than bureaucracies can. Community participation in introducing or improving management strategies can also minimize social conflict and maintain or improve social cohesion in the community.

In Bangladesh, the WorldFish Center and its local partners have successfully introduced community based management for managing the inland fisheries resources, by conferring the responsibility for looking after the aquatic resources to those whose livelihoods depend on them. Groups of poor fishers are now practicing sustainable fisheries management by establishing fish sanctuaries, controlling the use of destructive fishing gears and banning fishing during the spawning season in project sites. On site results indicate that annual fish production (kg/hectare) increased on average by 13 percent per year (Mustafa and Halls 2006). A significant observation is the ability of women folk to generate income for the households that reduces the dependency on fishing through micro-credit assistance (see Ruhi et al. 2006). Many are involved in small scale fish farming, poultry rearing, vegetable farming and traditional handicraft. An evaluation of the on-going community based management process in Bangladesh by FAO (2007) indicated that it had contributed to the development of self-help initiatives, local ownership and decision-making in communities.

### **Looking at broader fisheries governance**

The success of co-management and CBFM field trials indicates that community participation in fisheries management is essential towards improving fisheries production and fishers livelihoods. However, these success stories are based on the short term focus of the projects. Experiences with projects piloting co-management and CBFM in many countries have demonstrated success, but in many cases the initiatives were not sustained after project support came to an end. Sustaining the incorporation of co-management and community based management into fisheries management will require a broader governance approach. This includes the role of government as an equal stakeholder and the need for a legal framework for community based management, all somewhat understated in the many of our co-management or community based management related studies.

### **Role of government – not just to delegate power but to deliver net benefits**

In a co-managed management, it is not easy to define what responsibility or cost sharing should fall under the institutions representing the local fishing community or what falls under the government. As Nielsen et.al. (1996) points out, devolution of some authority to manage fisheries away from central administrations to user groups may be one of the most difficult tasks.

The local community might not be fully prepared to accept responsibility. The burden of cost-sharing might discourage poor fishers who survive on a day to day basis from participating. One of the greatest challenges observed through the CBFM 2 project is the sustainability of the CBOs on a long term basis without further incentive based support (Rab and Ahmed, 2006). However, Pinkerton (2003) in her article on understanding the complexity of co-managed resources argued that it is important that in a well developed co-management process, the relationship with government must be seen by fishing communities and other stakeholders as a partnership delivering a net benefit than as delegation of powers.

What is helpful to co-managing communities is that the government takes on the role of sponsor for technical support, credit, marketing assistance or protective legislation, such as occurred in the Philippines (Pomeroy and Berkes 1997). However, government is often also thought of as a stakeholder, given that it has a relationship with many affected actors and is itself affected by the outcome (Mikalsen and Jentoft 2001). This can occur as there is a risk for institutions formed and represented by the communities becoming bureaucratized and oligarchized in ways that run counter to the values and goals of the community they serve (Pinkerton 2003). They may have staff or committee members who do not necessarily communicate with community members in a regular and democratic way (Kofinas 1998), or even risk being overtaken by influential local community members. Therefore, as part of sustaining and ensuring an effectively managed community based institution, government could play the dual role of a stakeholder and sponsor for this institutional arrangement.

In short, even as communities claim more control over the local management of fisheries resources, government will have to remain the key player. Rather than dwelling on the issue of what management responsibilities should be delegated, the focus should be how partnership arrangements could deliver net benefits to all.

## SETTING UP LEGAL FRAMEWORKS FOR COMMUNITY BASED MANAGEMENT

In Bangladesh, the National Fish Policy 1998 commits to promote involvement of poor and traditional fisher-folks in the management and conservation of both open and closed water bodies although it does not directly mention community based management as an approach (Kabir, 2007). This can lay the groundwork for forging partnerships, but the implementation of the legislation is a pre-requisite to sustain the partnership arrangements.

Putting a legal framework in place for community level management in the co-managed partnership is essential as it indicates: 1) the political will and

support of governments; (2) legal recognition for the participating communities; (3) sustaining and strengthening institutions and linkages established under partnerships. Such a framework is useful to align the many co-management rights and activities within a matrix and this includes defining memberships and boundaries, habitat protection, enforcement, regional planning, data sharing, defining means of participation in voicing and setting broader policies.

Fishing is an industry that touches on several policies, e.g., trade, rural planning, economic, gender and securitization; and several goals, e.g., poverty alleviation, environmental and resource sustainability, food security, sustainable livelihoods or biodiversity conservation, resulting in global and local priorities. At the global level, international treaties on fisheries management focus on poverty reduction. At the local level, the fisheries management agenda is very much focused on local economic opportunities and participation in decision-making process. Much is made of the disparity between the priorities of global and local fisheries management agendas. However real synergies exist between these agendas and these would be enhanced if governments served the double obligation of attending to international agreements while sharing power in setting objectives for fisheries management with the communities (Viswanathan et al. 2003) through establishing clear legal frameworks for community based management.

## CONCLUSION

The continuing rise in the global population coupled with a stagnation of production in global capture fisheries led to the expansion of aquaculture. Asia led the growth, by contributing almost 90 percent to the world output of aquaculture. However, concerns remain as uncontrolled expansion will definitely increase dependency on capture fisheries for fish food.

Since aquaculture and capture fisheries have an inter-dependent relationship, both need to be managed more effectively. Centralized fisheries management systems, which are made up from fisheries policies, institutions, and support systems are burdened by bureaucratic inefficiency, institutional weaknesses, and fragile human resource bases.

Since the centralized, government-led system of protecting and managing fisheries resources is not working effectively in most cases, alternative approaches are necessary. In addition, there is an increasing consensus that fish and fisheries must be properly harnessed so that they will continue to provide sustenance for present and future generations. Community based management and co-managed arrangements in fisheries management are seen to be feasible options for bringing together the relevant levels of government and the users in pursuing a common set of goals to improve resource conditions and socioeconomic conditions of the community.

More than two decades of research have provided sufficient conclusive support for co-management and community based management as approaches for effective enforcement and equitable access for the poor and often voiceless fishers. However, it must be emphasized that a community-based fisheries approach may not be applicable everywhere. It cannot succeed in isolation. It is a complex process involving continuous consultation, negotiations, information sharing, and conflict management between stakeholders for improving existing management systems. There is a need to scale up the process to sustain institutions developed under community based management. This includes understanding the role of the government as partners in delivering a net benefit rather than just delegation of powers. The success of co-managed partnerships depends heavily on political will. Hence developing a legal framework for community level management in that partnership is important in sustaining community based organizations.

Community participation in decision-making is as crucial as government support and political influence in ensuring improved policies, fair regulations, and effective enforcement.

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