COMMUNITY BASED FISHERIES MANAGEMENT AS THE FUTURE FISHERIES MANAGEMENT OPTION FOR SMALL-SCALE FISHERIES OF BANGLADESH

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ABSTRACT

Fisheries resources are resource is a great natural asset to this planet and ensuring the responsible use of these resources can enrich the lives of its people. However, global fishery resources are under high and mounting pressure which is severe, particularly in the developing countries. Until recently, traditional fisheries management failed to prevent over-exploitation and degradation and often ignored the socio economic aspects in the case of small-scale fisheries. Moreover, many developing countries face major constraints in capacity and the ability to promote implementation of long-term sustainable policies. International concern about people and their resources has significantly impacted thinking about how fisheries should be managed and the need for greater responsibility by fishers and managers is becoming more frequently heard. Bangladesh, a reverine developing country of South East Asia where more than 70% of the population lives in flood plain and coastal situations, fisheries resources suffer from severe over-exploitation so resource protection is important in sustaining the contribution of aquatic products to food security and livelihoods for the people. This situtation urgently requires effective management measures which This can be best achieved by involving all user groups and the national fisheries agency, as the leader of the managers, for long term success oriented ultimately towards societal well-being, and based upon economic and resource sustainability. The purpose of this paper is to provide background information on the fisheries of Bangladesh and to justify the implementation of community-based fisheries management (CBFM) as vital if sustainable solutions are to be found.

Keywords: CBFM, Potentials, Inland Fisheries, Bangladesh.

INTRODUCTION

Aquatic resources are resource is a great natural asset to a country and ensuring the responsible use of these resources can enrich the lives of its people. The long-term economic prospects of a country largely depend upon the sustainable use of its unique natural resources. Nevertheless, resources are finite and there are competing uses for them. Moreover, the challenges for sustainable multiple use of these resources are evident globally. There will continue to be a need for it to be managed responsibly for a variety of purposes.

Until recently, traditional fisheries management has resulted over-exploitation, degradation, low level of compliance [1, 2] and often ignored the socio economic aspects in case of small-scale fisheries [3]. The most significant issues arising from existing fisheries management changes will be the resource protection and the equity in the allocation of access to the resource, both between and within the various users groups. In order to accomplish such targets it is important that the future management arrangements be designed in an integrated manner. Moreover, many developing countries face major constraints in capacity and the ability to promote implementation of long-term sustainable Policies [4].

For instance, Bangladesh is a small riverine developing country which covers an area of 144,000 square kilometers with a population of 140 million and has a high population density (about 800 persons per km^2, or

only 0.57 ha per head). More than 70% of the population of the country lives in flood plain and coastal situations and they have a perception about the fish and aquatic resources as a natural capital asset resource which needs no care but requires only exploitation. As a result, the country suffers from rampant over-exploitation and implementation overload of its aquatic resources. However, still there is excessive centralisation, fisheries development strategies are obsolete, the legal framework for fisheries is not strong enough, and there is a little provision for fisheries research in the country.

Hence, as has been seen over the last 30 years, fisheries are still marginalized in public development policy: small-scale fisheries are scarcely mentioned in national development plan. This may be mainly due to a lack of knowledge and communication concerning the role played by small-scale fisheries particularly in the case of food security, poverty alleviation, and employment generation in the rural society of the country. However, it may be partly due to institutional factors, including the weak capacity of the fisheries sector to express, define and defend its interests Finally, it may also be a result of 'psychological' factors linked to the perception which policy-makers, civil society in general, and some donors have about the small-scale fisheries. Therefore, the socio-economic conditions in small-scale fisheries communities are relatively alarming [4.], where the aquatic resource protection is an important ingredient in sustaining the contribution of aquatic products to food security and livelihoods for the people; this urgently requires effective management measures to be introduced [5].

There is great potential in the small-scale fisheries of the country when it can be managed in a participatory manner, and this needs to be demonstrated to provide greater understanding by the all concerned and create a positive image of small-scale fisheries particularly their economic and social benefits. The purpose of this paper is to provide background information of the inland fishery of Bangladesh and justify the implementation of CBFM activities as vital if sustainable solutions are to be found.

SMALL-SCALE CAPTURE FISHERIES OF BANGLADESH

Bangladesh is a South Asian country located between latitude 20°34′ and 26°39′ north and longitude 80°41′ and 92°41′ east. It is bordered by India to the west, north and the northeast, Myanmar to the southeast and the Bay of Bengal on the south (Fig. 1.).

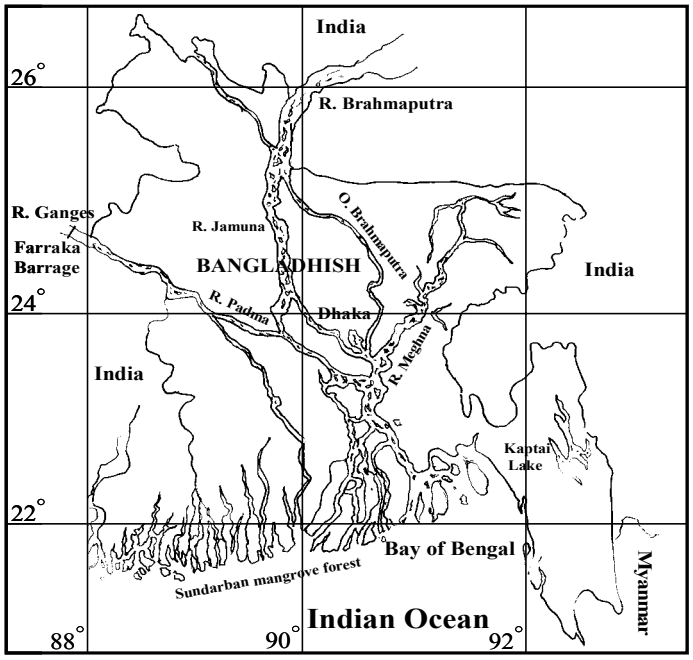


Figure 1. Map of Bangladesh

Bangladesh is a land of rivers and its mostly flat territories are crisscrossed by rivers. Rivers connected with the oxbow lakes (Beels & Haors), floodplains, marshes and deltas constitute its inland water bodies and associated wetlands that are the home of a wide variety of aquatic plants and animals [6,7]. They sustain thousands of communities with a wide range of benefits including communication facilities, irrigation facilities, drinking water etc. Particularly, the floodplains of Bangladesh, however, provide interplay of social, environmental resource management and developmental concerns. Unfortunately, the aquatic resources of Bangladesh are in critical situation such that their sustainable economic development is a priority issue for the country in coming decades. Small-scale fisheries of the country - mainly capture fisheries of the floodplains and rivers - contribute greatly to the livelihoods of the rural people owing to the very high productivity of the country's vast nutrient-rich inland water areas, enhanced by the tropical climate, and very fertile soil.

The major river system, along with their hundred of tributaries, carry huge volumes of nutrient-rich runoff from their catchments areas - water which is enriched further with nutrients from soil and vegetation during its way across the numerous flood plains in the monsoon season, when much of the country remains under water [8,9]. Varieties of aquatic organisms are including 260 indigenous freshwater bony fish species that belongs to 145 genera and 55 families [10] making a very rich aquatic bio-diversity in the inland aquatic area of Bangladesh (Table I).

Table I: Aquatic bio-diversity in inland open water fisheries resources of Bangladesh

Kinds of species	Number of species
Finfish	260
Endemic	1
Prawn	63
Turtles & tortoises	31
Chelonia	25
Exotic fish	13
Fresh water mollusk	20
Aquaculture	6
Crabs	Few
Aquatic mammal	2
Threatened	25

Source: National Water Policy [11], Baer [12] and FAO [13]

In addition, hilsha (*Tenualosa ilisha*) is an important single species of the country , which is a highly demanded fish in the local market and the annual catch of over 200 000 t accounts for 20% of national fisheries production of Bangladesh [14,15]. Besides the large number of fish species, the coastal and mangroves also support 24 species of shrimps belonging to five families with high commercial value which play an important role in the economy [16, 17].

Unfortunately, there are conflicting demands on the floodplains. The demand for agricultural production, particularly rice, encourages attempts to dry out the floodplains with a reduction in the open water areas and their fisheries resources.

The fish stocks are under threat of depletion due to indiscriminate and uncontrolled harvesting [6]. This situation has further been complicated by the physical loss, shrinkage and modification of aquatic habitats and threatened at least 25 riverine and floodplain fish species of the country (Table I). Increased use of pesticides and fertilizers in agriculture and growing industrial pollution are also contributing to the deterioration of the aquatic environment [18, 19].

On the other hand, artisanal fishermen of Bangladesh caught a large quantity of "Jatkas" (hilsha fry) in river system and in estuary by using small meshed gill nets [20]. The research survey carried out by the Bangladesh Fisheries Research Institute at Chandpur in 1997-98 shows that some 0.04 million metric ton (Mmt) of Jatkas numbering about 5100 million were caught in 1998 and the total yearly demand for fish in the country is 2.30 Mmt of which about 0.50 Mmt are short of supply [21].

In addition, the impacts of the present shrimp culture practice are quite alarming, since it is mostly dependent on wild sources of tiger shrimp (*Penaeus monodon*) fry that causes the death of many other aquatic organisms. .The conversion of mangrove areas to shrimp farms has obviously resulted in huge economic gains but also creating a long-term harmful impacts to the coastal communities. A number of authors have reported on the worst problems encountered by communities including the lost of access to ownership by the poor, reduction in employment opportunities, impacts on biodiversity from mangrove utilization, reduction in fruit trees, difficulty in poultry farming , scarcity of drinking water and percolation of salts in the surrounding soils [22-24]

However, by the commencement of the East Bengal State Acquisition and Tenancy Act of 1951, all inland fisheries resources (rivers, canals and permanent water bodies), except those from privately owned fish ponds that are relatively small and closed, have fallen under the state jurisdiction, with legal ownership held by the Ministry of Lands (MOL), and to a lesser extent, sub-district councils [25.]. Furthermore, around 12000 public water bodies, that are usually very high productive and provides the livelihoods for many surrounding communities, have been leased to the highest bidders.

Although preference has been given to the fisher's co-operatives, either directly or by bidding through a cooperative, control remains to in the hands of rich and influential people [26]. The value of formal access arrangements to these resources, such as leasing (centrally managed), has increased rapidly, providing a little revenue for the government but encouraging more complete depletion of the resource by leaseholders[27]. In many cases the state-established systems have proved to be ill-adapted to the needs and aspirations of small-scale fisheries communities [4] and have not made it possible to initiate activities to bring sustainable improvements to their livelihoods [28, 29]

Despite the many initiatives undertaken over the last 3 decades, the lack of an appropriated and sustainable management system, which meets the specific needs of small-scale fisheries, to facilitate community access to aquatic resources homogenously and sensibly, has been a recurrent problem in Bangladesh. Although the New Fisheries Management Policy, 1986 (NFMP) has appeared to be a good initiative to address the associated problems. This policy has represented the first steps towards promoting CBFM approach and attempted to ensure the long-term sustainability of fisheries resources as well [25].

Again, with respect to resource utilization, the fishing communities had unlimited access to the open water area which are the ideal natural breeding ground for many commercial and non-commercial fish species, the result being over-fishing and severe resource degradation. In fact, these kinds of mounting demand and short of supply have merged to make the population of these fisheries-dependent riverine communities very vulnerable. Continuing failure in fulfilling the ever increasing demands for fish in the country only increasingly threatens the livelihoods of the people and destroying the aquatic resources.

Under these circumstances, there is an immediate need for a rapid and substantial evolution of existing fisheries management strategies to support sustainable resource use. There must evolve a more dynamic partnership using the capacities and interest of the local community and resource users, complemented by the ability of the national government to provide enabling legislation and administrative assistance for greater participatory approach.

Therefore, the prospects of introducing community based fisheries management, in the small-scale capture fisheries of Bangladesh, to improve management efficiency particularly in relation to resource protection, food

security and socio-economic development have been highlighted to draw increase attention for the need of greater involvement of stakeholders.

Resource Protection

A series of measures has been introduced in the fisheries sector since independence in 1971, mainly to support training for individual farmers as well grass-roots organizations on aquaculture but a few to partly provided a supportive environment for the implementation of fisheries management. The conservation and protection of the aquatic resources has been stated as the main national objectives [30] but counter productive development strategy plans, centralized policy of leasing the public water bodies and open access to public water bodies have become a major constraint for the development and implementation of a sound national fisheries strategy [8].

The needs and aspirations of the fisheries communities have been hardly taken into account in the formulation of previously implemented projects. As a result, the situation concerning resources degradation and poverty in small-scale fisheries communities is now relatively alarming [8].

The Department of Fisheries (DOF) in Bangladesh has 845 technical officers and 3278 supporting staff with very limited funds available. Its ability for monitoring, control and enforcement over a large area of isolated water bodies and catch activities of over 3 million fishermen is distinctly limited [31]. The fishing communities, for their part, see the government's regulatory efforts as an attack on their means of subsistence since their livelihoods are increasingly threatened.

The fact is that governments have not been successful in solving the present crisis affecting most important fisheries such as hilsa [21] and compliance with rules and regulations by fishers has generally been low. The current situation suggests that the government and public are jointly responsible for the present resources degradation and it also predictable that if the sector policies do not change, more crises and conflicts will appear.

At the centre of the solution, the government needs to encourage the formation of fishermen's organizations at community level and the facilitation of their representation at local, regional and national levels, thereby creating a sense of ownership and accountability by the small-scale stakeholders in the decision-making and enforcement process. Simultaneously, the fisheries communities themselves need to play an active role in the whole management process, in order to ensure that the objectives identified are as close as possible to their own aspirations and ownership of the resources. At this stage, NGOs can play an important role by supporting community for successful establishment of the whole process.

Furthermore, it has been also confirmed that the participants had an opportunity to see that the co-management systems established, for instance, in the jointly implemented community based fisheries management pilot project (CBFM -1) area of the country, had made it possible to better protect resources and the most vulnerable groups (such as landless people) and that they proved profitable [32-34]

If the effective resources protection measures are to be built up to give sustainability and to ensure equal access to resources, partnership for the management of the inland fisheries resources must be promoted, together with capacity strengthening for the stakeholders.

Food Security

It is important to take into account that inland small-scale fisheries are entrenched in larger aquatic resource, social, economic and political systems of the country. Particularly, the nutritional contribution of the small-scale fisheries of Bangladesh is very important to the life of the rural people of the whole of Bangladesh and fish alone supplies about 60% of animal protein intake [35].

The present annual per capita fish consumption in rural areas is 4.4 kg for low-income people [36]. However, the target of the current Fifth Five-Year Plan [31] is to raise this per capita daily consumption to the level of 25.6–34.4 g by the terminal year 2002.
To achieve this target, based on an estimated total population, the required production of fish should be raised to 2.30 Mmt whereas the reported catch in the inland area amounts only 1.40 Mmt [36] with a continued shortage in the catch in the River & Estuaries (Table II).

Table II: Inland open water fisheries resources of Bangladesh

[Unit: Metric Ton]

INLAND FISHERIES	Water Area (Hectare)	Percent of total inland waters	Annual Total Catch 2000-2001 (A)	Annual Total Catch 2001-2002 (B)	Increase (B)-(A)	Percent Increase
(a) Inland Open water (Capture)						
(1) River & Estuaries	1,031,563	23.13	150,129	143,592	-6537	-4.35
(2) Sundarban			12,035	12,345	310	2.58
(3) Beel (Depression)	114,161	2.56	74,527	76,101	1,574	2.11
(4) Kaptai Lake	68,800	1.54	7,051	7,247	196	2.78
(5) Flood Lands	2,832,792	63.52	445,178	449,150	3,972	0.89
Capture Total	4,047,316	90.75	688,920	688,435	-485	-0.07
(b) Inland Closewater (Culture)						
(1) Ponds & Ditches	265,500	5.95	615,825	685,107	69,282	11.25
(2) Baors (Ox-bow Lake)	5,488	0.13	3,801	3,892	91	2.39
(3) Coastal Shrimp & Fish Farms	141,353	3.17	93,014	97,605	4,591	4.94
Culture Total	412,341	9.25	712,640	786,604	73,964	10.38
INLAND TOTAL	**4,459,657**	**100**	**1,401,560**	**1,475,039**	**73,479**	**5.24**

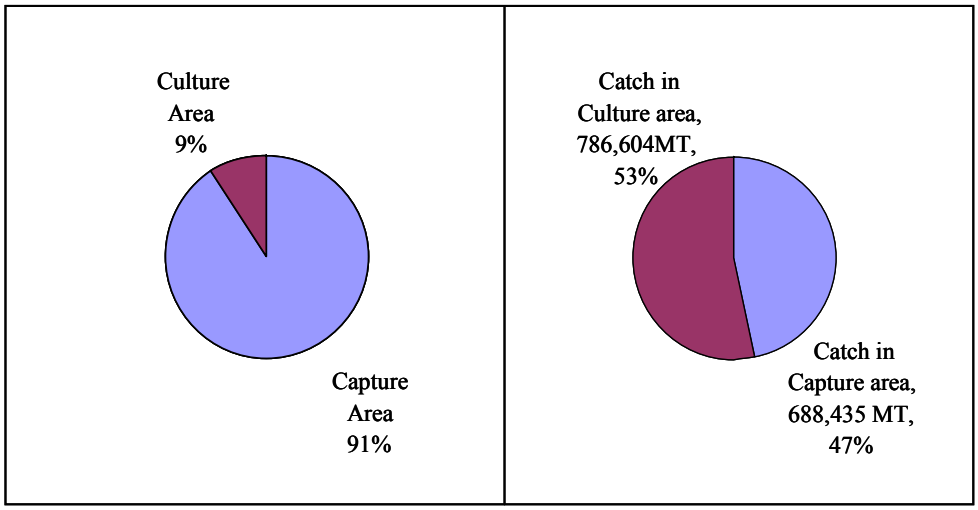
Source: DOF [41]

Data presented in Table II display one of the most important features about the uneven fish catch in the countries fisheries resources. On the other hand, the total catch of the inland fisheries had been estimated on the basis of a Frame Survey conducted in 1981-83 [37] which is too old to use to make an assessment of the present catch status since presently there is a severe scarcity for fish in the whole country.

In practice, there have been many changes that have already taken place or are in progress such as the increase of fishing effort and the increase of total demand for fish. Increasing emphasis should be placed on to identify the recent species status in the open water area since it have been reported that of among the 260 inland fish species, 54 face different categories of threats, of which 12 are critically endangered, 28 are endangered, 14 are vulnerable and 35% of the wetland-dependent mammal, amphibian, and reptile species are also either extinct, threatened, or commercially threatened [38]. Moreover, there is no evidence that the comparison of the real resources status and the exploitation rate have been made with in the socio-economic context of the country which is very important for policy makers to asses the performance of the existing activities.

On the other hand, it have been also identified that the national statistics are somehow poor and often conflict with the actual situation and with each other which is one of the basic problem for fisheries analysis, planning and evaluation in the country [35]. It is also particularly unrealistic, to make a judgement, based upon this 21 years old technique, because it may not properly reflect the present rate of exploitation and may resulted weakly based future projections and targets for fisheries policies.

It has also been reported that in the early sixties the inland fisheries of Bangladesh contributed about 90% of the total production of the country but presently account for around 36% only [31]. Although inland open water area of the country in which fish capture takes place comprises over 90% of the total area but contributes less to the total catch than fish cultivation which takes place in only 10% of the total area (Fig. 2.).

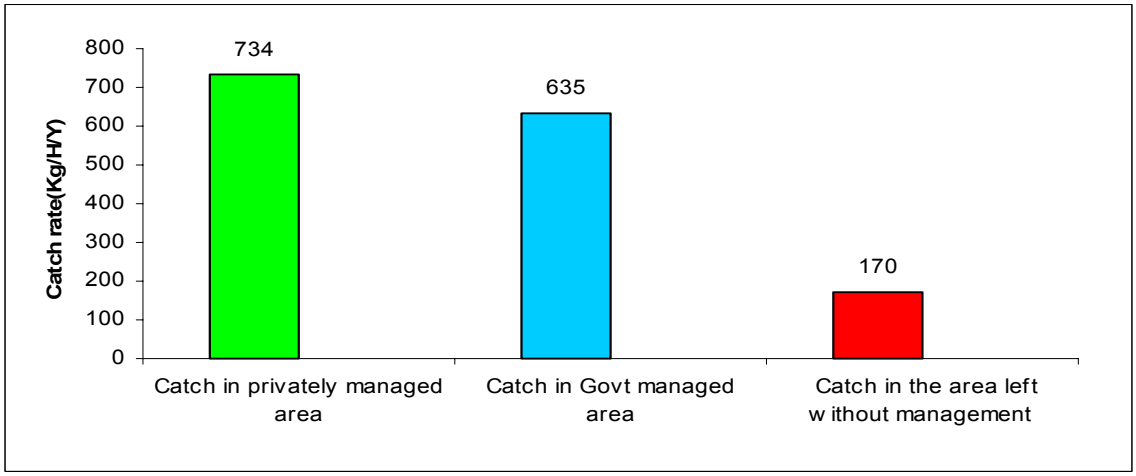


Data from DOF [41]

Figure 2. Area and catch of Inland open water area by hectare (H) and metric ton (MT)

The continued fall in catch and income linked to the high level of exploitation of resources due to open access and increased risk from the growing difficulty of access to the resources due to leasing of public water bodies has resulted in insecure livelihoods for fisheries communities, ultimately contributing to increased poverty. In fact the target fish species are becoming a scarce resource due to increased fishing effort resulted from open access to the public water bodies, including the major rivers, by the fisher's community lacking alternative job opportunities.

On the other hand, the country has a fairly very large area of open water area that covers over 4,047,316 ha that remains with out or a little management measures. By the introduction of CBFM approach to theses vast area can offer an estimated 0.20 Mmt additional fish for the country. There is a wonderful difference in the recorded catches in different management regime including the catch reported in the CBFM -1 project sites (Fig. 3.).



Data from DOF [37] and Rahman, et al., [39]

Figure 3. Fish catch rates in different management regime

It is believed that there are considerable prospects for the CBFM approach in case of the inland open water areas of Bangladesh. A number of case studies reported that, particularly in the CBFM-1 project area, the communities have succeeded in ensuring their own food security through increased protein intake and the use of the income from fishing activities. [40].

It has been also reported that in field trial sites in Bangladesh, annual per capita income increased by about 16 percent during three years of project period, and fish consumption rose by about 2 percent [30]. It has been also been recorded that yearly yield increased from 3,932 kg to 17,404 kg and the number of fish species increased from 46 to 64 in seasonal and perennial and wetlands as result of the community - based fish habitat restoration and management in a wetland in north – central Bangladesh [39].

Under these prevailing socio-economic conditions, it is unlikely that the government initiative alone will guarantee the protection of the fisheries resources and better nutrition for the majority of the people. Therefore, the introduction of community-based fisheries management would provide the most appropriate measures for the food security of the fisher communities and for the promotion of sustainable management of fisheries resources of this densely populated country.

Employment and Economy

Fishing is the traditional occupations for most of the rural communities of Bangladesh. Fisheries have been an integral part of the life of the people of Bangladesh, and play a major role in the national economy, particularly in foreign exchange earnings. Over 73% of all households of the country are involved in the inland fisheries [41] with the contribution to Gross Domestic Product (GDP) over 5% [42], to Gross Agricultural Product (GAP) about 14% and represents around 9% of the total export earnings [43].

Like other developing countries, small scale fishing has become the occupation of last resort for many rural poor people in Bangladesh. Off course, this opportunity resulted from the open access policy relating to inland open water and coastal fisheries of the country with the exchange of over-exploitation. However, the sector alone provides an opportunity of employment for over 2 million fishermen through fish catching, fish trading, fish transport and related business facilities [44], and over 10 million people engaged as part time fishers or subsistence fishers for family consumption [45].

Nevertheless, the country suffers from a very high rate (27.95 %) of unemployment [46] which urgently requires a solution, if the country is to secure economic and social well being. Unfortunately, the persistent poor status of fisheries resources and inadequate fisheries management together with the lack of alternative employment opportunities creates an ever increasing pressure on the fisheries resources of the country.

On the other hand, based upon a variety of case studies, it can be estimated that a CBFM approach can also contribute significantly to the livelihoods of 48 million households of the nearby areas and can create an opportunity of additional full time employment for over 7 million people of the country which can be a significant step forward towards the attainment of the national policy objectives [47].

In addition, it has been also reported by a number of authors that through the participatory approach, individuals have managed to be employed and more income generated, which has helped the fisheries communities set up a functional savings and credit association in the CBFM-1 project area [32,34]. Furthermore, it is a fact that the social organisation set up under fisheries co-management is generally well adapted to the small-scale fisheries sector. This can resolve the present socio-economic crisis of the country effectively, since it is primarily based on the principles of proximity, accessibility, sustainability, partnership and the involvement of the beneficiaries.

Most importantly, the failure to prevent over-fishing of important stocks, the opportunities of obtaining the national policy objectives without jeopardizing the equity issue and to increase the overall management efficiency, are among the main reasons why the government of Bangladesh has to aim for a CBFM approach.

It is also very important for a fishery dependent community to emphasize the relationship between the prevailing crisis in the fisheries sector and fisheries management within the context of the Code of Conduct for Responsible Fisheries (CCRF) and to identify suitable remedial measures in fisheries through a range of actions from participatory planning to implementation of community-based fisheries management activities.

Finally, a recent endorsement by FAO member states regarding the need for greater support to small-scale fisheries towards community based management has generated legitimate grounds for the country to be convinced for the introduction and implementation of CBFM approach, given the scale of employment and income it provides, and its role in food security[48] .

CONCLUSION

National and international experience increasingly suggests the need of participatory management measures for the sustainability of fisheries resource. These lessons must be learned and capitalised on without delay for the grater interest of the people and government of Bangladesh. If they are to improve their living conditions and livelihoods, the existing fisheries resource management problems need to be resolved with urgency. The introduction of a CBFM approach in the inland fisheries of Bangladesh is vital, for the protection and the sustainability of the country's fisheries resources, to resolve the present management crisis in a realistic way and to offer a better life for the people.

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