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Gender and local floodplain management institutions – A case study from Bangladesh

Parvin Sultana and Paul Thompson

Floodplain wetlands are the major common pool natural resource in Bangladesh. Men mostly fish, both men and women collect aquatic plants and snails. Case studies contrast a women-only, men-only, and mixed community based organization (CBO), each of which manages a seasonal floodplain wetland. The two CBOs where women have key positions are in Hindu communities where more women use aquatic resources, work for an income, and belong to other local institutions. In the oldest of these more women have gradually become office bearers as their recognition in the community has grown. In the Muslim community only a few women collect aquatic resources, most do not perceive floodplain natural resource constraints to be so important for them. These women have no role in the CBO and feel that they have no say in decisions about the fishery, unlike many women in the other two sites. The fishery management activities in all three sites are similar, and catches and biodiversity appear to have improved, demonstrating that women can play an effective role in community organizations for fishery management. Those who are represented in the CBOs reported significant increases in their participation and influence (women in the women-led site, etc.). Both men and women recognized that decision making over the fishery and active management had improved. Women had a more diverse set of criteria for effective CBOs than men, the men-only CBO saw itself as more of a membership based organization than representing all of the community.

Data from 36 similar CBOs (17 include women) indicated that women's involvement was associated with formal participatory planning. Once mixed CBOs were formed they were able to take actions quicker and experienced fewer conflicts and rule breaking incidents, suggesting that women's participation was associated with wider community acceptance of norms limiting fishing to sustainable levels.

Keywords: floodplain, fisheries, community, Bangladesh

1 INTRODUCTION

1.1 BACKGROUND

Bangladesh is traversed by numerous rivers and creeks as it is the delta of the Ganges-Brahmaputra-Meghna Rivers. Only 7.5% of the 1.5 million km^2 catchments area of these rivers lies in Bangladesh (Huda, 1989), and the water draining from China, Nepal and India produces a combined peak flow in Bangladesh of about 100,000 cumecs, five times the peak flow of the Mississippi (Coleman, 1968), and it may exceed 160,000 cumecs in a 1-in-100 year flood (FAP 4, 1993). More than two-thirds of Bangladesh is floodplains and may be classified as wetlands according to the definition in the Ramsar Convention. About 6-7% of Bangladesh is always under water, seasonally 21% is deeply (>90cm) flooded and around 35% experiences shallow inundation (FAO, 1988). The wetlands in Bangladesh encompass a wide variety of ecosystems including mangrove forests, natural lakes, freshwater marshes, baors (oxbow lakes), beels (floodplain depressions), fish ponds and tanks, one large reservoir, estuarine areas, and extensive seasonally inundated floodplains.

For the 85% of Bangladeshi households living in rural areas, working outside the homestead is very unusual for women, except for the extreme poor who have no choice. Women from poor and female-headed households by necessity take culturally unaccepted work as laborers in garment industries in the urban areas, in fish processing, brick breaking, earthwork for road construction, and road maintenance. Fishing is traditionally and culturally the preserve of men, fishing by women

is limited to their own household ponds or floodwaters near the homestead in the monsoon season. In the past, fish caught by women were seldom sold and any fishing that they did was only for family consumption. Access to and control over natural resources by women was virtually unknown. Men believe that fishing is a male activity and women have no role in catching fish and for building institutions men prefer men only to be included in decision making.

This paper investigates the development of institutions for community management of floodplain and fishery resources, the role of women and men in these community based organizations (CBOs) and their decision making, and outcomes in terms of resource management actions, changes in livelihoods, and changes in assets. Community based organizations established mainly for management of capture fisheries are the focus, in each case study site there were also smaller groups formed of poor fishers and these were represented in the committees. In some cases the CBO was membership based and comprised all of these group members, in other cases it was representational comprising representatives of these groups along with representatives of other stakeholders.

Data on the development of 36 community based fishery management institutions is also analyzed according to the involvement of women in the committees. This provides a wider context to and complements a more detailed comparison of experiences in established community organizations for management of three seasonal floodplain wetlands in Narail District in south-western Bangladesh. Fish in these areas are a free natural resource and no landowner ever denies access of others for fishing in their land in the rainy season, but landowners do control fishing in the ditches in their land in the dry season. Despite similar facilitation from a local NGO (Banchte Shekha) which normally only works with poor women, these three sites differ greatly in the extent that women are involved in resource management decisions and activities.

1.2 STATUS OF WOMEN IN BANGLDESH

The overwhelming majority of rural women in Bangladesh are not only poor but also caught between two vastly different domains: one determined by culture and tradition that confines their activities inside homesteads and the other shaped by increasing landlessness and poverty that forces them outside into wage employment for economic survival.

By custom, the life of a woman in Bangladesh is shaped by the patriarchal, patrilineal and patrilocal nature of the social system. Her reproductive role is emphasized by social, cultural and religious traditions. Traditionally to fulfill this role a girl was married off at puberty and was immediately locked into high fertility patterns, although this has very gradually been changing. The various elements of the social system interact to make women dependent on men or at risk when deserted and produce a rigid division of labor and highly segregated labor market by gender. The household is the primary production and consumption unit. Men generally own and manage family land and income and women's labor. Women contribute a great deal to the economy and to the family. Not only do they participate in agricultural and industrial labor but also they are charged with cooking, cleaning, collecting firewood and water and household washing. In addition, they assume full responsibility for rearing children and caring for the old. Nevertheless, a woman's contribution goes unrecognized in the national accounts because it is unpriced and invisible.

The role of women in society is seen as subsidiary to that of men and as having its principal concern with the household, reproduction and childcare and family management. The distortions show particularly in:

- average literacy - 38% for women, 52% for men (BBS, 1998);
- age at first marriage - 20 for women and 28 for men (World Bank, 1998);
- participation in education - women comprise only about 30% of the secondary and higher roll (BBS, 1998); and
- work: only 18% of women participate in the labor force (United Nations, 2000) – and have significantly lower wages when they do – but contribute 80% of the unpaid family work.

From the 1980s the status of women and the amelioration of their disadvantaged position in Bangladesh has been a major concern of the NGO movement. Whatever the limitations, there have been impressive strides in the empowerment and economic emancipation of women under the programs of the Grameen Bank and major national NGOs such as BRAC that have raised the economic role and voice of women in rural society throughout the country.

1.3 FLOODPLAIN RESOURCES

The four million hectares of inland water bodies and floodplains in Bangladesh are among the word's richest and most complex fisheries. These rivers, beels (lakes), baors (oxbow lakes), haors (large deeply flooded depressions), and floodplains support some 260 fish species (Rahman, 1989). About 80% of rural households catch fish for food or to sell (FAP, 16), and about 60% of animal protein consumption comes from fish, and of this 80% is from freshwater fish (BBS, 1997). However, fish consumption declined between 1995-96 and 2000 by 14% to 11.1 kg/person/year (Bangladesh Bureau of Statistics household expenditure survey data quoted in Muir 2003).

Since the advent of the green revolution, Bangladesh has made tremendous strides in increasing rice production. This success has occurred through many changes in the management of land and water. More areas have been brought under rice production, irrigation has expanded greatly, and areas have been drained and protected by flood control embankments. These changes have been at the expense of fish: the area of inland water bodies and the duration of inundation in some areas have fallen, and thereby there has been a reduction in the habitat for fish.

In addition to embankments, drainage and flood control; natural siltation along with over fishing are commonly cited as causes of the deterioration of the country's fishery resources (Hughes et al., 1994; Ali, 1997). Yet fisheries remain key floodplain resources, and the restoration of floodplain fisheries through community based management has the potential to be a major strategy to improve and make more sustainable the livelihoods and quality of food consumed by poor people. The National Water Policy has recently emphasized reserving wetlands for fish in a reversal of past trends (MWR 1999). Previous fisheries policies have discouraged development of local institutions for fisheries protection and management, but this may now be reversed.

In addition to fisheries, Bangladesh wetlands support a wide diversity of both cultivated and wild food plants, for example 2,929 local varieties of rice have been reportedly used in different regions of the country (NCS, 1991). In Bangladesh the following wild wetland plants are eaten (Karim, 1993): root stocks of four species of *Aponogeton* (ghechu); grains of *Oryza rufipogon* are used as a substitute for rice; fruits of *Ottellia alismoides* (locally called pani kala); flour is made from the seeds of *Typha angustata*; seeds of *Euryale ferox* (makhna) are eaten raw or roasted; seeds of *Trapa bispinosa* (singara) and *Nymphaea nouchali* are eaten as puffed grain; stems and leaves of *Amaranthus aquatica*, *Alternanthera* sp., *Ipomoea aquatica*, *Nymphea nouchali* (shapla, shaluk) and *Monchoria hastate*, and the leaves of *Limnocharis flava* (kalmi) are used as vegetables. Besides almost all species of fish, shrimps and crabs are used as human food, and molluscs are used as feed for domestic ducks and in freshwater prawn culture. Wetland plants are also used as fodder, as medicine, for mat making, fuelwood, and to protect homesteads against wave erosion.

1.4 GENDER ROLES IN FISHERIES AND OTHER AQUATIC RESOURCES MANAGEMENT

In Bangladesh fishing is the second most important occupation in the non-farm sector, but involvement of women was estimated to be 3% among the 36% of the total labour force (BBS, 1996). The role of women in fisheries encompasses social and economic tasks both within and outside the family in order to sustain the activities of fishing communities. Traditionally only men in the fishing communities were engaged in catching fish. It was only some old and widowed Hindu women who caught fish for their household consumption as well as for sale in the southern part of the country.

Now not only the old and widows, but all poor women irrespective of religion, age and marital status are found to catch shrimp fry in the coastal areas of Bangladesh. About 80% of the work force in shrimp fry collection are women and children. This change has happened due to extreme poverty and the growth of shrimp farming which created a low cost way of earning money. In 2000 from personal observations the price of each shrimp fry was around Tk. 1-2 and on an average each woman could earn about Tk. 5,000 (approximately US$ 95) in a fry catching season (January to March).

Although fry catching by women is quite accepted in the coastal areas, fishing by women in inland water is not yet a regular and common picture. Some Hindu women catch fish in the canals and waterbodies near their houses with rods and hooks, rarely with cast nets. Women also catch fish by hand in shallow water and paddy fields, particularly in the coastal areas.

In shrimp processing plants 80% of the work (such as deheading, sorting, peeling of small shrimps, and packing) is done by women while men break ice slabs for preservation. More generally in inland fisheries most of the post-harvest work such as drying fish is done by the women. Women also are responsible for storing processed fish. Gears such as nets and traps are made mostly by women and other family members. When the men sit idle or do not go out fishing they help in net making. Mending and cleaning nets are mostly done by men, but tanning is solely done by the women.

Women also collect snails and aquatic plants. They sell snails to the duck and prawn farmers. Sometimes traders buy snails and they engage women to break the snails. They work as paid laborers. This snail trade has become a very popular business in the southwest of Bangladesh where there has been a rapid expansion of shrimp and prawn farming. While this provides an additional income source for women who are able to access snails freely, it is increasingly thought by local people (men and women) that there is now overexploitation of snails.

Only over the last two decades did policy-makers, planners, researchers and society in general begin to consider and value women's economic contribution in food production and income generation. In Bangladesh the men take fishing related decisions (Table 1). During the rainy season women and children also catch fish in the floodplain. Most of those fish they use for household consumption and some also for sale.

Table 1 Fisheries related decision making by gender in Bangladesh (% of households).

Decision	River		Closed beel		Open beel		Floodplain	
	Men	Women	Men	Women	Men	Women	Men	Women
When to fish for income	74	45	51	27	95	47	13	3
When to fish for food	59	50	56	40	88	56	13	85
If preserve fish	47	26	15	16	10	5	0	0
If make fishing gear	48	15	41	9	12	9	74	
What to purchase	32	47	57	74	54	76	20	78
What to purchase from women's income	28	31	44	37	8	44	11	28
Total number of household surveyed	978	936	345	445	238	230	100	114

Source: unpublished data from baseline survey, Community Based Fisheries Management Project, ICLARM.
Closed beel = lakes isolated from wider floodplain, open beel = floodplain depressions.

2. STUDY SITES AND COMMUNITIES

Beels are natural depressions where water stands during the monsoon and in the monsoon there is open access for fishing for members of the surrounding communities. Rain water and daily tidal influences are the main sources of seasonal flooding. All three of the sites covered by this study are protected by flood control embankments constructed along the rivers by the Bangladesh Water Development Board (BWDB).

2.1 GOAKHOLA-HATIARA

Goakhola-Hatiara Beel is a seasonal floodplain beel (wetland) covering at its maximum extent around 250 ha. The beel is connected by Goakhola Khal (a natural canal) via a sluice gate to Afra Khal (a secondary river), which connects to Bhairab River some 3 km downstream of the beel, but local rainfall is the main source of water in the beel. All of the lands within the beel are privately owned and are cultivated mainly with paddy in the dry season. The area is under around 1.2-1.8 m of water for 5-6 months of the monsoon each year. During the monsoon paddy is also grown on much of the area (and very recently has changed from traditional mixed aus and aman paddy to early monsoon (aus) paddy. Land owners have shallow ditches (locally called *kua*) in their land where no crop is grown but where they trap water and fish at the end of the monsoon and by the end of the dry season they drain out all the water and catch the fish. The five villages around the beel (Hatiara, Goakhola, Bakri, Mandiarchor and Debbhog) are entirely Hindu communities. In December 1996 there were 355 households living around the beel of which 89 were already NGO (Banchte Sekha) group members.

As all the land is private, farmers dominate in the area and as this is a floodplain and the community is a Hindu farming community, the number of professional fishers is very negligible. Access to aquatic resources during the monsoon is free for all from the surrounding villages owning land in the beel. Anyone can fish anywhere in the monsoon, but in the post monsoon period nobody is allowed to fish near the private kuas. In the nearby Bhairab River high competition for fishing exists and the Hindu community do not feel comfortable fishing there throughout the year. Therefore, poor including landless poor do not depend always on fishing. Almost all of the households catch fish some time in a year, over a third sell fish, the remainder fish just for their own consumption

2.2 MALIATE BEEL

Maliate Beel covers 100 ha of private land just east of Goakhola-Hatiara Beel, and the two beels are interconnected with another three seasonal beels in the monsoon. Water stays permanently in only 3% of the area. One channel from the beel area is connected to the river. During the dry season 70% of the low-lying land comes under irrigated HYV paddy cultivation, the rest of the land is cultivated with other winter (*rabi*) crops. The few high lands are occupied by homesteads. The four villages around the beel are inhabited by 591 households. They are all lower caste Hindus.

2.3 SHULUAR BEEL

Shuluar Beel is a seasonal beel (flood in the monsoon season), and is larger than the other two beels, covering at its maximum extent around 1000 ha. It is located in Narail district in southwest Bangladesh. The beel is connected by a canal to the rivers Chitra and Nabaganga (secondary rivers), but rainfall is the main source of water in the beel. All of the land in the beel is private and is cultivated mainly with paddy. There are around 967 households living in five villages around the beel. Approximately 90% of households are Muslim. The beel is seasonal and in the monsoon there is open access for fishing for members of the surrounding communities. Almost all the households catch fish sometime in a year, half of the households are very poor who depend on fishing and other aquatic flora and fauna for income, the other half of the households just fish for their own consumption.

2.4 ROLE OF WOMEN IN AQUATIC RESOURCE USE IN THESE SITES

In general women of ethnic and other minority groups are more liberated and are more advanced than the rural Muslim women in Bangladesh. Two of the case study sites - Goakhala-Hatiara and Maliate Beels – are Hindu communities and there about 90% women fish seasonally for food and income. About 60% of women and children catch snails for household use or for income, and about 10% women are employed as snail breakers. However, the scenario is different in Shuluar Beel, where the majority of the people in the community are Muslim and conservative. Men take all the decision and women remain within the house. Men do not want their women to join in any group or organization.

3 PROJECT INTERVENTIONS AND SOURCES OF DATA

3.1 PROJECT APPROACHES

The community of Goakhola-Hatiara Beel has since November 1996 been supported by projects to establish community based management of the fishery. An NGO (Banchte Shekha) from the region that only works with poor women has facilitated this with support from government and WorldFish Center, and the focus has been on conserving fish in the dry season (Thompson et al., 2003). From late 2001 Maliate and Shuluar Beels were added to the same program as a second phase of the Community Based Fisheries Management (CBFM) Project (WorldFish Center 2003).

The general CBFM model adopted in the three sites is to include representatives from all types of stakeholders in the Beel Management Committees (BMC). The institution itself was formed through selection by the community members, NGO staff and the local fishery department.

The general approach in two beels - Goakhola and Solua – included: stakeholder analysis; informal grouping according to livelihood characteristics; developing consensus within the livelihood category and consensus among all stakeholders on problems, constraints and possible solutions; and analysis of social, economic and environmental impacts of the solutions. The community formed a BMC with all types of stakeholders in the floodplain, but gave priority to the fishers, although the number of full time fishers in these beels is very few.

The second approach adopted in one beel, Maliate, involved all stakeholders but separated women as the main stakeholders (Fig. 1). The NGO formed groups with the women

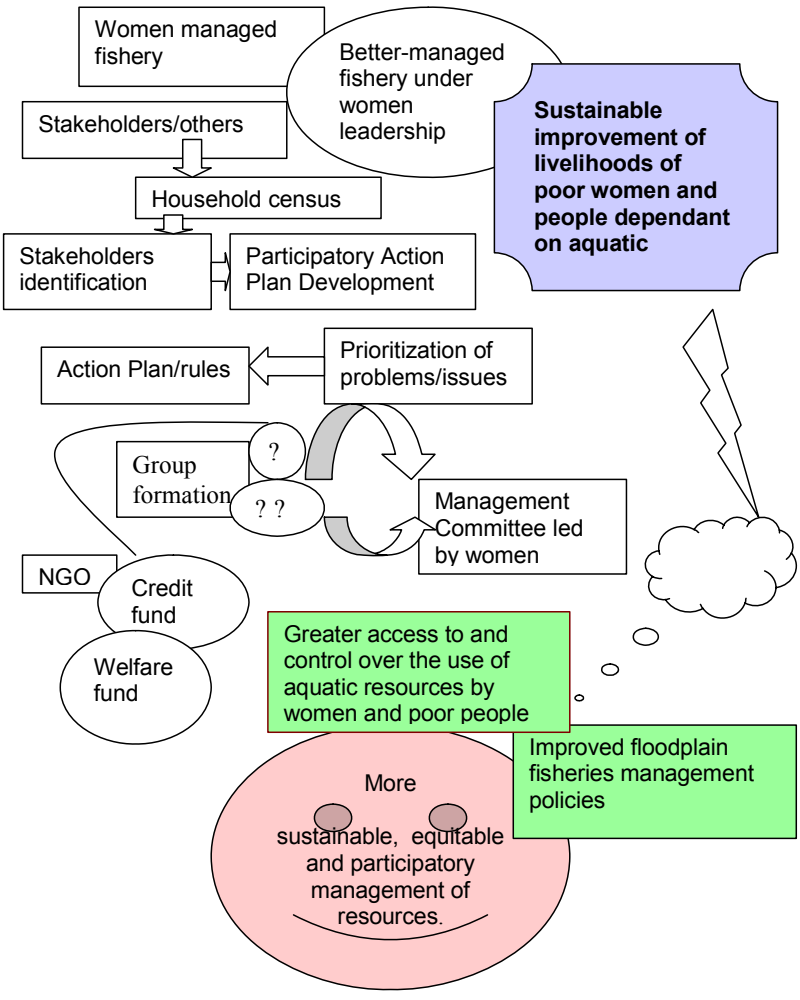


Figure 1 CBFM approach adopted in Maliate Beel

for income generating activities. Other stakeholders in the community participate in the management committees either as committee members or as members of the advisory committee.

In addition from mid-2003 Goakhola-Hatiara Beel has been the site of promotion of Integrated Floodplain Management (IFM) approaches developed and extended through a research project involving the same agencies, but making links with agriculture (Sultana et al., 2005). The focus of the IFM approach has been the scope to improve overall floodplain productivity by better understanding the links between private and common pool resources, decisions of individual farmers and collective action. For example, it has facilitated farmers (who also catch fish for food) testing and then adopting alternative dry season crops that do not require irrigation and thereby reduce abstraction of surface water for irrigation, resulting in more water that the community protects for fish to over-winter.

3.2 DATA SOURCES

Studies undertaken by the CBFM-1 and 2 projects since 1996 to understand the fishery and impacts of management changes in Goakhola-Hatiara have included: baseline household surveys of 60 participants of the groups organized by the NGO Banchte Shekha and of 60 non-participant households in 1996; regular monitoring by local women of fishing and fish consumption for 30 participant and 30 non-participant households for a week each month since 1997; monitoring of fish catches and effort in the beel twice a month by a research assistant since 1997; and impact surveys in 2001.

In all three beels baseline household surveys stratified by poverty level and fishing involvement were conducted in 2002, and fish catches have been monitored.

As part of a study of institutional issues for integrated floodplain management focus groups were held with all of the BMCs in 2003. As part of a project to promote uptake of IFM approaches participatory planning was undertaken in Goakhola-Hatiara and Maliate Beels, and data was collected on agricultural changes, water levels and fish catches. In addition as part of that study household impact surveys were undertaken for all three sites in August 2005. Moreover at different times participatory assessments and learning sessions with focus groups comprising representatives of each stakeholder group were held.

4. FLOODPLAIN MANAGEMENT INSTITUTIONS AND ROLE OF WOMEN AND MEN

4.1 GOAKHOLA HATIARA BEEL

4.1.1 Beel Management Committee

The institutions involved in CBFM activities here start on one side with the NGO primary groups. In the case of Banchte Sekha all the primary group members are female. Each primary group has 10-15 members. Each group has a chairperson, secretary and cashier. The female groups have their own income generating activities and are not necessarily involved in fishery activities. As Banchte Sekha has no male groups, there is no direct way of supporting fishing households to divert from fishing for an income during the closed season, so credit is disbursed through the female groups for those poor fisher households. Female group members have personal savings and they also receive training on different Income Generating Activities (IGAs) through Banchte Sekha.

The Beel Management Committee (BMC) was formed in 1997 with representatives of a mixture of professions from the community. Most of them are farmers and fishing is their seasonal activity, the committee has always contained several women, all of the women are members and representatives of the groups formed by Banchte Shekha. Table 2 shows how the committee has evolved since 1999. Representatives of two villages, Goakhola and Hatiara, dominate in the committee.

Table 2 History and composition of Goakhola-Hatiara Beel Management Committee.

Year	General Body		Office bearers		Executive Committee	Advisory committee
	M	F	Male	Female		
1999	19	8	President, Vice president, General Secretary, Cashier	Only members	None	None
2000	19	8	President, Vice president, General Secretary	Asstt Secretary, Cashier	None	5 men
2001	19	8	President, Vice president, General Secretary	Asstt Secretary, Cashier	None	5 men
2002	22	9	President, Vice president, General Secretary	Cashier, Communication secretary	None	5 men
2003	13	14	President, Vice president, General Secretary	Cashier, Communication secretary	None	6 men
2004	16	11	President, Vice president, General Secretary, Assistant Secretary,	Cashier, Communication secretary, Organizing secretary, Women-issue secretary	8 men, 9 women	None

The BMC is a selected body – there are group representatives and then representatives of other stakeholder categories and local leaders who the community and NGO selected to be in the committee. BMC members meet every month but if there is an emergency they meet any time. They received training on leadership development, waterbody management, fisheries management and accounting. All the members are literate and they have some technical knowledge. Women members also received training on different IGAs and most of them are running individual enterprises.

The main activity of the BMC has been to take up fish conservation measures and it tried unsuccessfully to extend to water control (see below). The BMC is also responsible for coordination with other stakeholder groups as well as different organisations. They take decisions through participatory discussion with the primary groups. The women members of Banchte Sekha guard sanctuary kuas in the day time while men in the BMC and husbands of the women guard at night. The BMC members aided by public announcements informed the general community not to poach in these kuas.

To keep coordination between villages there is an advisory committee composed of elderly people and local elites. The advisory committee is responsible for providing necessary support to the BMC and to keep liaison with the local government for back-up support.

The BMC has succeeded in implementing the local rules that it sets, and claims 90% compliance. Some people who were fishing illegally during the closed season when caught by the BMC members were subject to punishment of different levels. They have a joint bank account with the NGO staff member supporting their activities. Each member makes contributions to the fund. The CBFM project provided some revolving fund and grants, and all of this fund was deposited in the account. Moreover, the BMC successfully appealed to the UP chairman and got the lease to the khal (canal) without any fees for making it into a fish sanctuary. The BMC has a small community centre located next to the beel. The land was donated by one of the BMC members, and structure built through CBFM-2 grant. For proper identity and formal recognition, registration of the BMC is needed, however this has not been done yet as the Social Welfare Department ended new registrations in 2005.

4.1.2 Other institutions

There was a sluice gate operation committee which was separate before, then it was decided to merge it with the BMC. However, this did not work and the gate reverted to being operated by one

large farmer. The old sluice gate management committee formed by Bangladesh Water Development Board (BWDB) has not been active for some time. The sluice management committee was intended to operate the sluice to ensure fish could migrate into the khal and beel. However, this has proved difficult since fry and juvenile fish occur in the river outside the sluice in April-June when the gate is closed to keep out floods which would damage standing *boro* (irrigated dry season) paddy crops.

The BMC president is also invited to the Upazila Jalmohal Committee (sub-district fisheries committee) where he can raise issues and let the committee know about the problems related to the waterbody. The BMC also resolves local conflicts and appeals on problems to the judiciary department. They organise rallies, street drama for raising awareness among the local people as well as the neighbours. The BMC liaises with all local level officials and the NGO.

For IFM an ad hoc committee was formed based on a local farmer field school plus representatives of other stakeholders in 2003 after the initial PAPD. This was revised in July 2004 into a formalised IFM committee through an open meeting (facilitated by the project) of the community stakeholders where they were asked if they wanted to change members of the ad hoc committee – five committee members were changed through this meeting. The IFM committee comprises of 15 members (six are women from Banchte Shekha's groups): two women and four men are from the BMC, it also includes two representatives of the sluice gate committee, three local farmers, and four women from the farmer field school. From 2005 the different local institutions working in this floodplain have been better coordinated as the IFM committee includes members from the BMC, sluice gate operators (large farmers), IPM farmer field school, school committee, and local theatre group. In effect these different committees and institutions are now operating like sub-committees with coordination of their activities through the IFM committee. The IFM committee has collected fees from local community for the pipe-sluice.

4.2 MALIATE BEEL

The institutional arrangement for CBFM in Maliate Beel is similar to that for Goakhola-Hatiara Beel, with the important difference that the BMC only comprises of women from Banchte Shekha's groups, they have taken a lead in fishery conservation and management in the beel. As shown in Table 3, the women felt the need to involve some men at least in an advisory committee.

Table 3 History and composition of Maliate Beel Management Committee.

Year	General Body		Executive	Office bearers		Advisory
	Men	Women	Committee	Men	Women	committee
2002	0	24	none	None	President, Vice president, General Secretary Cashier, Communication secretary, Organizing secretary, Women-issue secretary	7 male, 1 female
2004	0	24	17 members	None	President, Vice president, General Secretary, Cashier, Communication secretary, Organizing secretary, Women-issue secretary	5 male

Because it is adjacent to Goakhola-Hatiara Beel and links with it in the monsoon, this has functioned as an extension of IFM in Goakhola. The BMC members and farmers have been invited to IFM project activities such as field days, participatory assessments and exchange visits. After seeing the IFM committee in Goakhola in Maliate the community also formed a similar 15 member IFM committee, but most (nine) of its members are women and come from the BMC and most of the men come from its advisory committee.

4.3 SHULUAR BEEL

Before the CBFM project this beel never had any local institution for resource management or any development work. The community comprises mostly of Muslims and men have a dominating character. In this area NGOs were not allowed to work freely with the women. Banchte Shekha only works with women and when they started the CBFM-2 project they faced problems for forming women groups. The men did not allow women to take part in the BMC and no woman was included in any committee (Table 4). Even during the Participatory Action Planning (PAPD) workshop women were not allowed to come in the plenary for discussion. After forming the BMC the committee needed funds for establishing sanctuaries and households (men) wanted credit for alternative occupations during the closed season. Banchte Shekha denied to lend money to the men and they kept motivating BMC members to allow women to be part of the fishery development work. After one year the men allowed women to form a few groups. Women are now taking credit and the men have become used to it. After several meetings, the BMC felt that women could be a good publicity link as they go to other women during leisure time or to their kin. They decided to add two women in the committee. However, the BMC was originally big and members were not attending meetings regularly, so in 2003 they reduced the number in general body and formed a 9-member executive committee with the active people, and did not include any women. There was no change in the committee membership or numbers since 2003.

Table 4 History and composition of Shuluar Beel Management Committee.

Year	General Body		Executive	Office bearers		Advisory
	Men	Women	Committee	Men	Women	committee
2002	39	0	none	President, Vice president, General Secretary Cashier,	None	None
2003	29	0	9 members	President, Vice president, General Secretary Cashier	None	None

No change after 2003, but Banchte Shekha formed women groups

4.4 COMPARISON OF CHANGES IN BEEL MANAGEMENT COMMITTEES

The roles of women and men in Goakhola-Hatiara Beel have changed over time. This site has the longest history of CBFM and has always had men and women in its CBO. In 1999-2002 about 30% of the committee members were women, this changed to 52% in 2003, but in addition throughout this time there was a male advisory committee. Moreover in 1999 all four office bearers were men so the level of women's involvement in decision making was limited, then in 2000-2003 two out of five office bearers were women. In 2004 the advisory committee was dropped, an executive committee was formed with 52% of its members women, and half of the eight office bearers were women. Thus over time women have come been accepted by men as playing a more active role in decision making and now have a roughly equal role to men.

There have been no such changes in the last three years in the other two sites: Maliate has only women in the committee, and has a male dominated advisory committee which the women wanted as it helps them for linking with local institutions and obtaining help for night time guarding. Shuluar has throughout had an all male committee, although in 2003 women's groups were formed for savings and credit they are not represented in decisions on fishery and floodplain resource management.

These differences between sites are also reflected for example in the establishment of community centers: in both beels where women are involved, it was women office bearers who donated land to build a community center, but the men-only CBO negotiated with a male landowner who was not active in the CBO to temporarily make land available, and thus is less secure. It is also evident that facilitation by an NGO that focuses on women's development is not sufficient to ensure women's

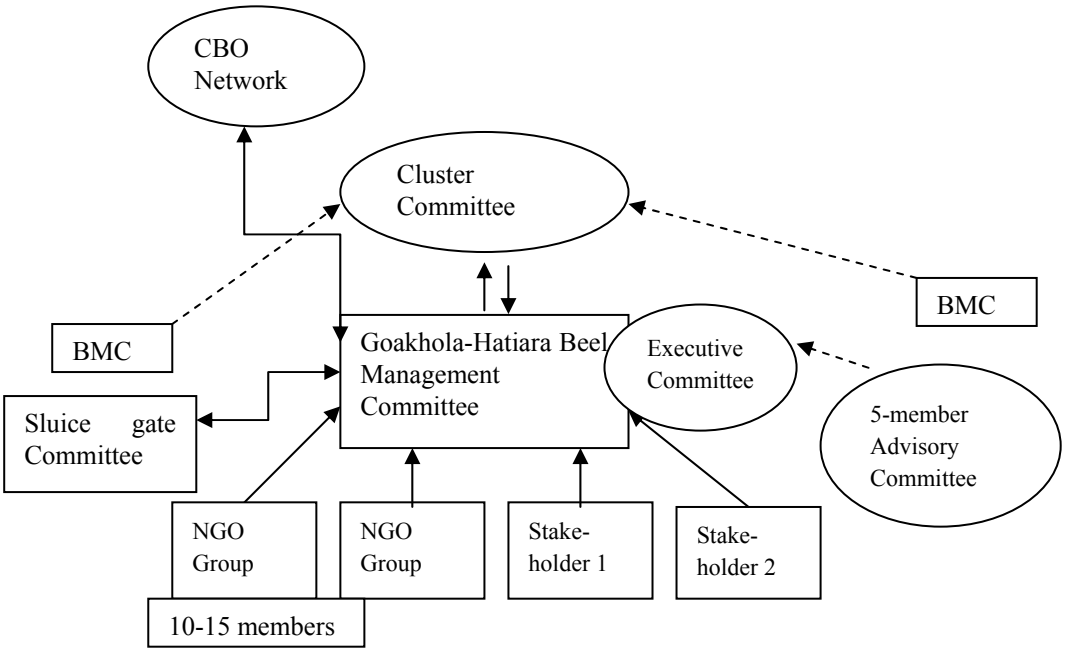
participation in decision making and community institutions, this is also affected by cultural norms and the extent that women and men directly use the resources.

4.5 BEEL CLUSTER COMMITTEE AND LINKS WITH OTHER INSTITUTIONS

The general links for co-management under the CBFM-2 project are shown in Figure 2. At the field level the fishing community is represented by the Beel Management Committee (Community Based Organisation – CBO) that is supported by the NGO (Banchte Shekha), with technical advice from Department of Fisheries (DoF), all partners receive advice and facilitation from WorldFish Center as needed. Wider linkages for the committee are into a network of similar CBOs and with local government – the Union Parishad mainly.

Under CBFM-2 the BMCs from the adjacent beels formed in 2003 a cluster committee. The cluster committee is composed of 7 members, one from each beel plus a member from DoF. This cluster committee and other similar committees in the area are expected to form a Central Committee after formation of all cluster committees. The cluster committee was formed to strengthen all the individual BMCs and to help them develop a unified action plan so that all the waterbodies in the same connected cluster benefit from one another's management activities equally. It acts as local conflict resolution body. This committee also works as pressure group for any fisheries policy implications.

Figure 2 Institutional Structure and Linkages for fisheries management in Goakhola Cluster



5 IMPACT OF FISHERIES INSTITUTIONS IN CASE STUDY LOCATIONS

In this section we review impacts and changes that may be associated with the CBFM institutions developed in the three case study sites, wherever possible distinguishing the opinions and possible impacts between men and women, but also considering overall changes and differences between the sites since each represents a different extent of women's and men's involvement in the resource management CBOs (BMCs and additionally the IFM committees in Goakhola and Maliate). The issues and changes considered comprise of: perceived problems, use of aquatic resources, outcomes

and trends in the fishery, interview survey results focusing on participation and CBFM indicators of institutional effectiveness, and assessments of the institutional arrangements by the participants.

5.1 PERCEIVED PROBLEMS AND ISSUES

There is some evidence that the problems and issues that are priorities for men and women differ and this could have a bearing on collective action. However, problem censuses conducted separately with men and women at different times and then consolidated indicate that the differences are greater between sites than between men and women (Table 5). In both Goakhola-Hatiara and Maliate 70-90% of the main problems identified related to common pool natural resources – fish, surface water, floods and other aquatic resources, the rest were mainly private natural resource related (low crop prices for example). In Shuluar only two out of ten priority problems of women related to common pool natural resources, and six were not natural resource related, while for the men 44% of 16 priority problems were common pool natural resource related and 31% were not natural resource related. The differences appear to directly relate to the extent that women actively collect and support livelihoods using common pool resources (in the Muslim community of Shuluar only men go fishing or collecting other aquatic resources), and the extent that the local societies are concerned for the commons – the Hindu communities appear to have a greater concern for common resource problems even though the environments and status of natural resources were similar in all three sites. Despite this apparent difference in local priorities, the CBO in Shuluar has been able to take similar resource management actions, although with only three years of community management there it is early to assess sustainability.

Table 5 Ranking of problems as part of participatory planning by landless men and women.

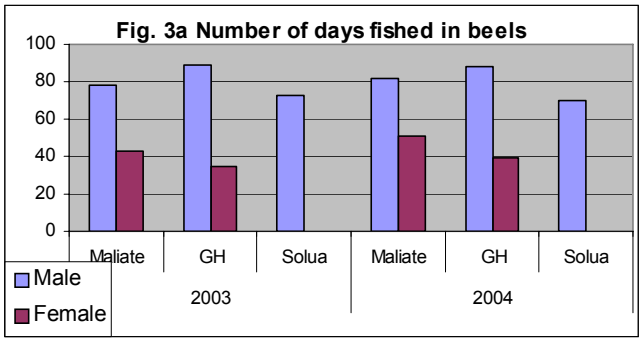
Problem	Goakhola		Maliate		Shuluar	
	Women	Men	Women	Men	Women	Men
Natural fish declining	1	1	1	1	1	1
Lack of safe drinking water					2	6
Water logging	10	2				3
Siltation of canal	3	9	2	8		3
High cost of cultivation		4	9			5
Snail /aquatic plants declining	2	10	3			8
Lack of grazing land- few livestock	4	8	4	7		8
Low prices of agricultural commodity			10	6		10
Encroachment of khas land by farmers						10
Fruit trees declining					7	9
Water pollution	9				2	8
Flood	5				8	
Bad road communication					4	2
Electricity					6	7
Lack of homestead area					2	
Lack of health care facility					3	10
Lack of sanitation					5	
Conflict		3	5	4		9
Fish disease	6	5	7	3		
Catching brood fish in breeding period	7	6	6	2		
Scarcity of fishing gears		6		9		
Improper operation of the sluice gate.	8	7	8	5		
Lack of educational institutions.						10
Number of problems	10	11	10	9	10	16
No. of problems shared (men and women)	8		8		7	
Common pool natural resource related	9	8	7	6	2	7
Private natural resource related	0	2	2	2	2	4
Non-natural resource related	1	1	1	1	6	5

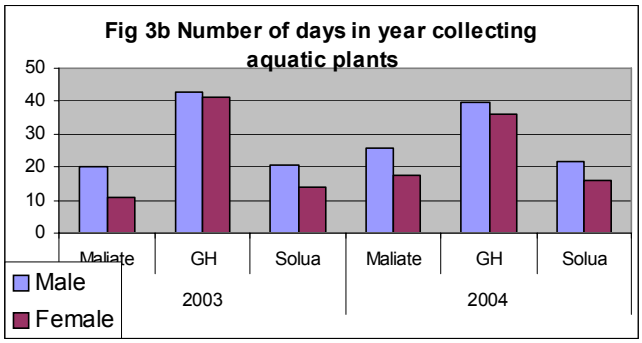
Source: PAPD in Shuluar – July 2002; Maliate – February 2004; Goakhola-Hatiara – July 2003

In each case about 15-16 persons were in the sessions, separate session held with each stakeholder category, only men and women from landless/poor category shown here for comparability.
In Shuluar this was immediately before forming the BMC, in Maliate this was two years after forming the BMC, and in Goakhola this was immediately before forming the IFM committee but six years after forming the BMC under CBFM.

5.2 AQUATIC RESOURCE USE

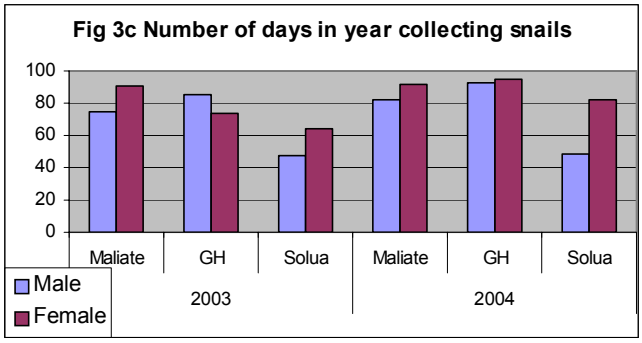
In 2003 and 2004 the number of days that a panel of 40 households in Maliate and Goakhola Beels and 50 households in Shuluar Beel were involved in collecting different aquatic resources and other work were recorded distinguishing men and women in the households. This has been summarized for the main natural resources. Fishing was a major activity for men – averaging about 80 days a year all three beels (slightly less in Shuluar). On average al least one woman (including girls) from a household spent about 40 days a year fishing in both Goakhola and Maliate (Hindu communities), but no women were involved in fishing in Shuluar (Figure 3).

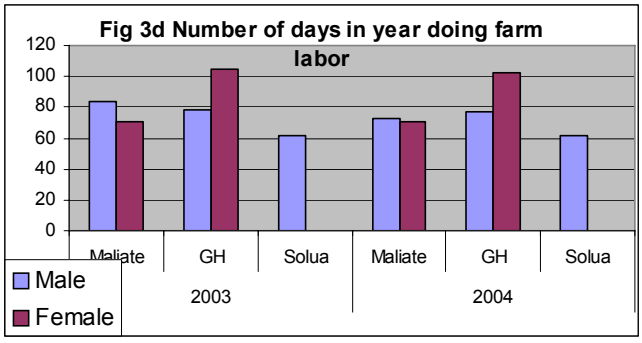


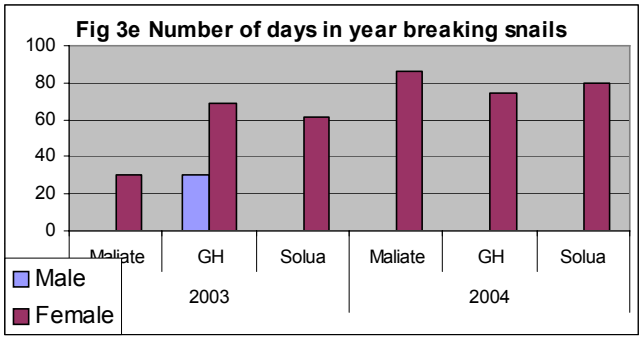


The patterns were similar to this for day laboring – no women did this work in Shuluar, but in the other two beels women were just as likely as men to do daily laboring work in both 2003 and in 2004.

Although in Shuluar Beel women are not involved in fishing or laboring, they collect aquatic plants and snails and break snails for selling or work as snail breakers for traders. These women are from very poor families including widowed/abandoned or divorced women who have no men in the family to provide an income. Women from those households in Shuluar Beel do these jobs for income everyday during the monsoon. Snail collection only happens when fewer men are around – when water is cool in the morning and snails float on the water surface. They break snails at home and sell to traders who come to their homes. Whereas, in the other two beels women from all categories of households catch snails whenever they get time, including when they are fishing (but they are also busy in their farm or working on others' farms and they do post harvesting work too).







5.3 OUTCOMES FOR FISHERIES

The general management activities and outcomes in all three case study sites are

similar. The BMCs protect fish in the dry season in some deep ditches (small sanctuaries), but the impact and the processes are different. The committees declared the early monsoon season closed for fishing. As a result some scarce fish species have been restored. In Shuluar only men benefit economically from wetland management, but in the other two beels women fish and collect other aquatic resources.

5.3.1 Management actions

In Goakhola-Hatiara Beel from the dry season of 1997-98 to the dry season of 2001-02 usually five kuas were rented and protected as sanctuaries each year. The individual kuas differed between years, the BMC chose those that the owners were willing to rent to it and that it thought had a good fish population. No fishing was allowed in those kuas. The average kua is about 7.8 decimals in area, indicating a total sanctuary area of about 0.16 ha out of a total area of kuas of about 2.9 ha. In 2003 to 2005 no kuas were rented as sanctuaries. The BMC designated the whole of the khal as a dry season sanctuary up to and including the early monsoon, but allowed fishing there in the monsoon and post monsoon. The area of the khal in the dry season is not more than about 1-1.5 ha. In the 2004-05 dry season the BMC excavated some plots that were bought by CBFM-2 project to create permanent sanctuary kuas, but these will not have any impact on fish catches until 2006 since they were dry for excavation in the dry season of 2004-2005.

In Maliate and Shuluar Beels the same strategy was adopted: from the dry season of 2002-03 some kuas were rented as sanctuaries and were protected, and in 2004-05 some permanent sanctuary kuas were created. Similarly in all three sites each year the first three months of the Bangla year (Baishak, Jaistha and Ashar) - mid April to mid-July - have been declared by the BMC as a closed season with no fishing permitted in the beel or khal.

5.3.2 Fish catches

The data on fish catches comprises two parts: catches from various gears (mostly gill nets, traps, hook and line, and cast nets in years of higher water levels, plus a few lift nets located in the khals; and secondly the catch from the kuas. Data is only available for a series of years for Goakhola, this indicates higher catches from 1998 onwards (a year after the start of conservation measures), but also shows exceptionally high catches in 2001-02 (mostly from lift nets) that were not continued (Table 6). Only one year of data is available for the other two sites so no trend can be seen.

Table 6 Changes in fishing effort and catch (excluding kuas).

Year	Total gear days	Total catch (kg)	CPUE (kg/person)
Goakhola-Hatiara			
1997	2,699	6,364	2.09
1998	2,852	11,074	3.35
1999	3,743	9,102	2.14
2000	4,667	12,822	2.48
2001	6,249	36,861	4.99
2002	6,812	26,082	1.99
2003	7,723	19,493	1.88
2004	4,188	12,501	2.21
Maliate			
2004	3,949	8,964	3.57
Suluar			
2003	6,977	13,919	1.56

CPUE = catch per unit effort (per person in this case)

Source: catch monitoring undertaken on one day every week or two weeks as part of CBFM-1, CBFM-2 and R8306 projects.

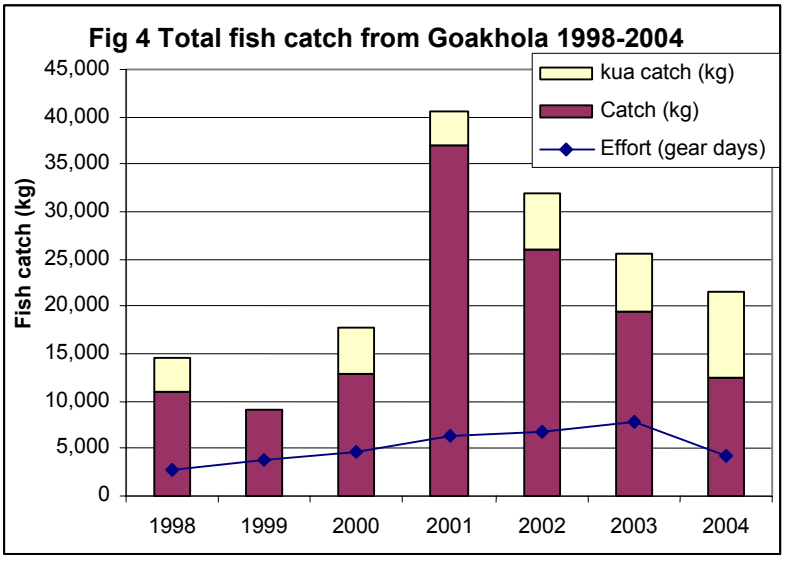
A major part of the fish catch, usually about a quarter of the total catch, comes from the many kuas in the floodplain of Goakhola (and also in Maliate) Beel. In Goakhola before the introduction of IFM kua catches fluctuated around 50 kg per kua (water area of just over 7 decimals). Kua catches increased in 2002 in line with the increase in fish population and catches experienced from 2001 (the kua harvest takes place in the first months of the year and involves fish left over in the ditches from the previous monsoon). This increase continued up to 2004, in 2005 to conserve some fish no kuas were harvested three times and a few were left un-fished, but the catch remained high (Table 7). The trend was similar in Maliate, but in Shuluar there was a notable gain in kua harvests in 2005 suggesting that conservation measures there have been effective, but that the benefits may go more to owners of ditches who tend to be better off than many of the other households involved in open water fishing.

Table 7 Fish catch and returns from kuas in 2003-2005.

Year	Goakhola Beel			Maliate Beel			Soluar Beel		
	No. of kuas fished	Catch (kg)	Mean (kg/kua)	No. of kuas fished	Catch (kg)	Mean (kg/kua)	No. of kuas fished	Catch (kg)	Mean (kg/kua)
2003	87	6,097	67	39	2,583	66	49	4,740	97
2004	87	9,100	100	40	3,088	74	52	5,736	110
2005	83	6,643	73	36	2,688	64	60	12,106	202

Source: census of kuas and reported catches according to owners

Overall there do appear to be gains from improved fishery management, at least in Goakhola-Hatiara Beel which has a longer series of data, which translate into higher fish catches, although the catch has fluctuated between years (Figure 4). This benefit reaches both men and women there, since women also catch fish and can show a return from their involvement in fishery management through better fish consumption and a supplementary source of income.



5.3.2 Fish diversity

Fish species diversity appears to have increased in all three sites as a result of conservation measures, mainly small sanctuaries in the dry season, plus observing early monsoon closed seasons: in Goakhola Hatiara there are eight years of detailed catch monitoring records indicating that the number of species recorded per year was 28 in 1997-1999, and rose to 34 per year in 2000-2004; in Shuluar the number of species caught doubled between 2002 and 2004; and in Maliate 21 were caught in 2003 and 36 in 2004 (Table 8). However, diversity of fish consumed has not changed over the same periods, in part this can be because households buy fish that have been caught in any of the local floodplain beels and appear in the local markets, including cultivated fishes. For Goakhola

there was sufficient data to review changes in wild caught fish from the beel in the diet, which suggest (after allowing for changes in the survey method in 2002) that species diversity fluctuates. Nevertheless discussion with the communities indicate that some scarce floodplain species, notably meni *Nandus nandus* and pabda *Ompok pabda* have recovered since CBFM activities started.

Table 8 Fish species count by waterbody by year.

Waterbody	Year	Species recorded from catch monitoring	Species recorded from consumption monitoring	Local wild species from consumption monitoring	Wild species only recorded in this year
Goakhola-Hatiara*	1997**	30	58	45	3
	1998	26	53	38	2
	1999	29	57	42	3
	2000	33	54	40	1
	2001	35	47	35	0
	2002*	34	48	37	5
	2003*	30	42	29	0
	2004*	40	39	28	1
	cumulated	62	81	65	15
Maliate Beel	2002***	na	38		
	2003	21	32		
	2004	36	32		
Shuluar Beel	2002****	23	44		
	2003	36	41		
	2004	47	43		

* The size of the sample of households monitored for their fish consumption changed to 30 households from 2002, in previous years it was 60 households

** data from consumption monitoring is from last 4 months of year only

*** data from consumption monitoring is from last 6 months of year only

**** data from consumption monitoring is from last 5 months of year only

Source: catch monitoring undertaken on one day every week or two weeks as part of CBFM-1, CBFM-2 and R8306 projects. The catch for a sample of gears was recorded.

Consumption monitoring: daily records for a panel of households (7 days a month for Goakhola in 1997-2002; 6 days each alternate month for that site and the others thereafter).

Thus Maliate Beel demonstrates that women are just as capable as men in protecting fish. In both of the beels where women are involved in the CBOs and in resource management they have maintained sanctuaries and guarded them in the day time, and have been helped by men (husbands) to guard the sanctuaries at night. Moreover much of the pressure to ensure community compliance with sanctuaries and fishing rules comes from women in the homestead who control what is cooked, discuss the issue in group meetings, and (in two of the beels) decide to catch or not catch fish by their own hands.

5.4 INVOLVEMENT OF MEN AND WOMEN IN RESOURCE USE, INSTITUTIONS AND THEIR OPINIONS

5.4.1 Context, resource use and incomes

A household interview survey was undertaken in August 2005 where men and women from the same households were interviewed separately, mainly to assess their opinions and perceived changes over the last three years. The sample covered the same households (30 in each of Goakhola and Maliate and 50 in Shuluar) that had been surveyed earlier. However, an additional sample of farming households was surveyed and where appropriate data from this larger sample is reported.

Education levels differ between men and women and between women in all the beels (Table 9). The women in Maliate Beel are more educated than the women in Goakhola and Shuluar and even better educated than men in the same beel. This is probably one of the reasons for women being in the lead positions in all the floodplain resource management institutions in that area. However, one reason for and component of the subordinate position of the women in Shuluar Beel is perhaps lack of education and awareness. For the last few years girls have received grants and wheat for attending up to secondary school level, for which parents send them to school so this may change over time.

Table 9 Education level of male and female respondents (%) in 2005.

Education level	Goakhola-Hatiara		Maliate		Shuluar	
	Male	Female	Male	Female	Male	Female
None	13	19	36	12	46	46
Can sign only	21	19	17	17	26	32
Primary	27	44	21	31	14	12
Secondary	5	0	7	5	4	0
Higher (including degrees)	34	18	24	40	10	0
Total response	62	62	42	42	50	50

Respondents were head of household (mostly men) and spouse/senior person of opposite gender in household

Although farming is claimed to be a man's job in all the beels (Table 10), in Goakhola-Hatiara and Maliate Beels women do as much farm related work as men. Most of post harvest activities are done by women. In Shuluar Beel women are mostly housewives and men do all the farming jobs as well take decision. In addition more of the respondent men are dependent on laboring and fishing as primary occupation in Shuluar Beel.

Table 10 Main occupation (%) of respondents in 2005.

Occupation	Goakhola-Hatiara		Maliate		Shuluar	
	Male	Female	Male	Female	Male	Female
Farming	85	0	72	0	44	0
Fish related	2	0	0	0	12	0
Labor	8	8	5	16	28	0
Trade/handicraft	2	0	12	0	4	2
Skilled labor	3	0	2	0	2	0
Service/teacher	0	3	5	0	0	0
Housewife	0	85	0	79	0	98
Other	0	3	5	5	10	0
Total respondents	62	62	42	42	50	50

Respondents were head of household (mostly men) and spouse/senior person of opposite gender in household

None of the sample respondents are professional fishers in Goakhola-Hatiara, and there are no known full time fishers in this community (Table 11). Virtually allhousehold sthere have some farmland, and the fishing period is short, with a lack of other sources of fish in the rest of the year. The river near Goakhola-Hatiara and Maliate Beels does not hold a large population of fish. The men are mostly involved in part-time fishing. They use traps and gill net after monsoon and fish for both food and income. The women are involved in fishing mostly for food, some widow and women from poor households sell fish to make money. This picture is very different from other parts of Bangladesh where women never fish in open water. In Shuluar Beel women do not fish except for a few women from very poor families who fish by hand when water recedes in November-December. In all the beels women only use rod and line or hand to fish. The men usually use gill net, traps and other devices.

Table 11 Involvement of respondents in fishing (%) in 2005.

Fishing involvement	Goakhola-Hatiara		Maliate		Shuluar	
	Male	Female	Male	Female	Male	Female
Professional	0	0	5	0	12	0
Part-time	32	27	10	12	34	2
Subsistence	50	37	62	36	26	0
Never fished	18	35	24	52	28	98
Total respondents	62	62	42	42	50	50

Respondents were head of household (mostly men) and spouse/senior person of opposite gender in household

The income in all three beels from harvesting different aquatic resources was quite substantial considering that these common pool resources are only available during the monsoon and provide an extra income (Table 12). It was reported that due to conservation of fish during the dry season, in the wet season the amount and value of fish harvested in open water and in private ditches (which trap fish at the end of the monsoon) increased. However, benefits are not being distributed evenly in Shuluar Beel where landowners are now preventing other people from fishing in their lands. However, they are not harvesting fish by dewatering. The findings are consistent with the labor use in collecting aquatic resources discussed earlier: men mainly fish, while women in Goakhola and Maliate obtain over half of the value of aquatic resources they collect from plants and snails. Moreover, women contribute almost half of total household income derived from floodplain common pool resources in those two beels, but very little in Shuluar.

Table 12 Annual income /value of natural resources (Tk) collected in 2003 and 2004.

Income source	Goakhola-Hatiara		Maliate		Shuluar	
	Male	Female	Male	Female	Male	Female
2003						
Income from all aquatic resources	4,240	4,000	4,830	4,520	4,330	720
Income from fishing (open water)	3,910	800	5,300	1,860	4,140	0
% income from fishing	92	20	91	41	96	0
2004						
Income from all aquatic resources	6,080	4,810	4,490	3,750	4,350	670
Income from fishing (open water)	4,900	1,920	5,970	2,400	4,160	0
% income from fishing	81	40	75	64	96	0
Overall contribution of men and women						
% of aquatic resource income	54	46	53	47	86	14
% of fishing income	76	24	73	27	100	0

Figures are in Taka: US$ 1=Tk.62 in early 2005
Source: household aquatic resource collection survey

Separate data for 2004-05 (Table 13) showed similar average household incomes from aquatic resources in Goakhola and Maliate Beels to the figures in Table 12, but rather higher average incomes from fish in Shuluar. Average household incomes in Goakhola in 2004-05 were double those in Shuluar, and 75% higher than in Maliate. However, the main source of income for Goakhola Hatiara is government service and business, and not from the beel itself. Only about 25-30% of average household income comes from own-farm cultivation in all three beels. Daily wage income is low in Goakhola compared to other sources, but a substantial amount comes from daily sources in Maliate. Aquatic common pool resources contributed 16% of household income in Maliate and Shuluar, but only 6% in Goakhola due to the high non-beel related incomes there.

Table 13 Household income from different sources (Tk per household) in 2004-2005.

Income source	Goakhola (N=30)	Maliate (N=30)	Shuluar (N=50)
Daily (e.g. labor)	19,060	23,990	17,930
Annual (e.g. business)	59,590	9,260	10,480
Agriculture	22,800	17,250	15,180
Aquatic resources	7,060	10,630	8,580
All	108,500	61,130	52,160

Source: household impact survey
US$ 1=Tk.62 in early 2005

As might be expected, given their dominance over income earning activities, men borrowed and sold assets more than women in 2004-05. But it is notable that even in Shuluar 21% of borrowing and asset sale was by women (Table 14), there they are mostly involved in NGO activities and received some loans from them. Men in general in all three sites had wider sources for borrowing, such as banks and money lenders. In Maliate Beel women as well as belonging to the NGO groups have their own revolving loan fund from where they can borrow money which may help explain the higher percentage (48%) of total loans and asset sales taken by women, and the relatively higher ratio of borrowing and asset sales to income. These women manage the amount by themselves. In Goakhola the IFM committee also has a fund but the amount too small to use as revolving loan fund. However, in the 2004-05 rabi (dry) season they requested and received seasonal loans from Banchte Shekha for rabi crop cultivation. This was a big help for them.

Table 14 Value of credit and major asset sales (Tk per household) by gender of borrower in year 2004-2005.

	Goakhola	Maliate	Shuluar
Men	18,962	16,236	10,350
Women	9,357	15,250	2,824

5.4.2 Organization membership and self assessments

Involvement of women in Goakhola-Hatiara and Maliate Beels in local organizations is higher than that in Shuluar Beel (Table 15). In Shuluar the sample women are only involved in NGO groups, and despite the all-women BMC few of these women were in the sample from Maliate. By comparison the sample from Goakhola includes women who are active in the CBM and IFM committees as well as school committees and NGO groups. The results are consistent with information from focus groups – that women in Goakhola (but also Maliate) are more involved in local institutions outside of those created for fishery and floodplain management.

Table 15 Organizational membership (percentage of respondents, multiple responses/memberships possible) in 2005

Institution	Goakhola-Hatiara		Maliate		Shuluar	
	Male	Female	Male	Female	Male	Female
Beel Management Committee	13	11	4	2	17	
Mosque/temple committee	10	2	4		15	.
IFM committee	6	9	2	6		.
Sluice gate committee	6		2			.
IPM group	6	2	4		2	.
School committee		6	2			
NGO group/ cooperative (general or women's)	2	17	4	21		25
% of respondents belonging to some local institution	44	45	23	30	33	25

Respondents were head of household (mostly men) and spouse/senior person of opposite gender in household

When separate focus groups were asked to assess the level of social capital in their community using five indicators and scales, the scores differed between men and women and between sites (Table 16). In Goakhola and Maliate Beels all indicators were much higher than Shuluar except for conflict, indicating a much higher general level of trust and cooperation for example in those beels. Since this assessment was made when the BMCs in Maliate and Shuluar were being formed, this difference helps to explain differences in the effectiveness of the BMCs, and greater problems in Shuluar. They certainly think there is scope for improvement and they mentioned that difficulties over access to waterbodies for the poor were one reason for them to think that social capital needed to be improved. In general men scored all the indicators lower or the same as women in all three sites, indicating that women see their communities as more harmonious than do men.

Table 16 Self assessments of present level of social capital indicators in 2002 (scale 1-10).

Indicator	Goakhola Beel		Maliate Beel		Shuluar Beel	
	Male	Female	Male	Female	Male	Female
Trust	+5	+7	+7	+8	+1	+4
Unity	+5	+9	+7	+9	+2	+4
Empathy	+5	+5	+8	+8	+2	+5
Cooperation	+7	+8	+10	+10	+2	+3
Conflict	+10	+10	+8	+10	+8	+8

Source: PRA focus groups held in 2002

In August 2005 interview surveys were conducted with the same random sample of households that had been interviewed in 2002 as a baseline for CBFM-2. The sample was stratified and included about 80% poorer households (up to 0.2 ha of land) and the rest better off, but landholding/ poverty categories are combined here. Opinions were taken in response to a range of statements related to collective action, fishery and floodplain resource management issues (Table 17). This indicated high levels of agreement that people could participate now in managing common resources, and that poorer households were benefiting. Notably less than half of women think that their voice is heard in beel management decisions even in the beels with women in the BMCs, but in Shuluar only 8% of women think their voice is heard. Similarly knowledge of women in Shuluar regarding improved floodplain management is less. But all respondents accept fishing related rules. In addition some impacts of the IFM project are apparent in Goakhola where there has been less increase in groundwater irrigation through shallow tubewells (STW), and more respondents recognize the scope to limit water quality problems from jute retting (which have been addressed by the IFM project through training and demonstrations there).

Table 17 Responses to statements regarding community based management and integrated floodplain management

Indicator/statement	Goakhola Hatiara		Maliate Beel		Shuluar Beel	
	Male	Female	Male	Female	Male	Female
a) Mean score for opinions [a] (Number of respondents)	30	30	30	30	50	50
Community people can participate in common property resource management	4.46	4.21	4.19*	3.74	3.62	3.43
My voice is heard in management	3.82*	3.18	3.23	2.62	3.10**	2.20
I know how to improve livelihoods dependent on floodplain	3.82	3.79	3.96	3.78	3.57*	2.89
People should be able to fish wherever they like	2.14	2.14	2.19	2.15	2.17	2.13
People should be able to use whatever gear they like	2.07	2.18	1.89	2.19	2.02	2.19
Rule breaking is sometimes acceptable	2.37	2.37	2.04	2.15	2.46	2.70
Small/marginal farmers are benefited from new crops	4.14	4.21	3.85	4.00	4.04	3.85
Agricultural laborers are better of now than 3 years ago	4.07	4.18	4.15	4.04	4.13	4.21
Jute retting can be modified to minimize any harm to the aquatic environment	4.11	3.96	3.96	3.80	3.47	3.70
Use of STW has increased in this area in the last 3 years	3.79	3.93	4.11	4.00	4.38	4.36
b) % Agree or strongly agree (Number of respondents)	30	72	28	52	50	50
Community people can participate in common property resource management	93	90	93	88	72	70
My voice is heard in management	70	42	54	23	40	8
I know how to improve livelihoods dependent on floodplain	70	72	89	81	68	32
People should be able to fish wherever they like	13	11	14	8	12	14
People should be able to use whatever gear they like	13	13	11	10	12	18
Rule breaking is sometimes acceptable	23	10	14	8	32	38
Small/marginal farmers are benefited from new crops	93	97	89	92	90	84
Agricultural laborers are better of now than 3 years ago	93	97	93	96	90	98
Jute retting can be modified to minimize any harm to the aquatic environment	90	90	79	85	58	72
Use of STW has increased in this area in the last 3 years	67	65	93	85	92	100

[a] scale: 5-Strongly agree, 1-Strongly disagree

* men v women, paired t-test, $p<0.05$

** men v women, paired t-test, $p<0.01$

Note that men and women from the same random sample of households were interviewed, but in addition in Goakhola and Maliate the wives of an additional sample of farmers were asked to respond to the statements, these responses are included in the percentages but not in the statistical tests

Source: interview survey - respondents were head of household (mostly men) and spouse/senior person of opposite gender in household

Men and women from the households were asked separately to score the present situation and that of three years before for a range of indicators for community based management of these floodplains, a self-weighting ladder scale was used raging from 1 (worst imaginable case) to 10 (best imaginable case). The results (Table 18) indicate that in Goakhola participation and influence on decisions both at community level and regarding the fishery has increased significantly for men and women, but was scored significantly higher by men than their spouses. By comparison in Maliate with the all-women BMC only women reported significant increases in participation and influence and manly with regard to the fishery and IFM. While in Shuluar only men reported significant increases in their participation, they also have significantly higher scores for general participation and influence then their wives unlike in Maliate.

Table 18 Respondent assessments of changes in key indicators of community management of fishery assessed through comparison of mean scores in 2005 and 2002.

Indicator	Goakhola Beel (N=30)			Maliate Beel (N=28)			Shuluar Beel (N=50)		
	Male	Female	Diff	Male	Female	Diff	Male	Female	Diff
	2005	2005		2005	2005		2005	2005	
Participation in community affairs in general	5.57 AC	4.04 D	M*	3.74 c	2.85		3.11 A	1.67	
Influence over general community affairs	5.41 AC	4.37 D		3.30	3.04 d		3.32 AC	1.83	M*
Participation in fisheries management and /or IFM	4.63 AC	3.44 D	M*	2.22	2.48 d		1.70 C	1.23	
Influence in fisheries management and/or IFM	4.35 C	3.62 D	M**	2.22	2.30 D		1.82 c	1.66 d	
Decision making on rules for use of fishery resources	5.64 C	5.61 D		5.26 C	5.37 D		5.28 C	5.62 D	
Fair access rights to this fishery resource	5.57 C	5.61 D		4.22	4.19 D	F*	4.67 -c	5.22 a	
Active management of this fishery (sanctuary, etc)	6.18 C	6.29 D		6.33 C	6.19 D		5.72 C	5.37 D	
Community compliance with fishery related rules	6.21 C	6.29 D		6.67 aC	5.93 D		6.21 C	5.87 D	
Overall well being of this fishery/floodplain	5.86 C	6.07 D		6.19 aC	5.52 d		4.49 -C	4.38 -D	
Overall well being of your household	6.39 C	6.25 D		5.89 C	5.81 D		5.28 C	5.30 D	
Household income	6.36	6.43 D		5.93 C	5.85 D		5.74	5.36 D	
Information availability and exchange among stakeholders	5.86 C	5.61 D		6.04 C	5.85 D		5.54 C	5.49 D	

Indicators were scored by the respondents on a scale of 1-10 with 1 and 10 defined respectively as the worst and best conditions that the household could imagine for that indicator.

Paired t-tests:

Comparing male v female responses for 2005: a - $p<0.05$, A – $p<0.01$, location of letter indicates gender giving higher score.

Comparing scoring for men in 2005 v 2002: c – $p<0.05$, C – $p<0.01$ (negative indicates 2002 was significantly higher than 2005)

Comparing scoring for women in 2005 v 2002: d – $p<0.05$, D – $p<0.01$ (negative indicates 2002 was significantly higher than 2005)

Diff = comparing changes in scores 2002-05 for men v women: M* - male score increased more than women $p<0.05$, M** - male score increased more than women $p<0.01$, F* female score increased more than men $p<0.05$.

Source: interview survey with random sample, respondents were head of household (mostly men) and spouse/senior person of opposite gender in same household. Men or women were not willing to answer these questions in two of the Maliate Beel sample households.

Respondents believe that decision making on fishing rules, access and resource management have all in general improved significantly. In Goakhola-Hatiara, despite having the longest established CBFM institutions and activities, both men and women reported similar significant improvements, and the scores did not differ much from the other two beels. In Maliate, where women take the beel management decisions, they perceived more significant improvements than men, and reported an increase in fair access that was significantly greater then for men, which presumably reflects their increasing role in beel management since 2002 and the formation of their BMC, and their voluntary formation of a committee for IFM. However, in Shuluar Beel the changes in scores were contradictory: men and women gave significantly higher scores in 2005 for rule making, active fishery management and compliance, yet men reported a decline in fair access and both men and women regard the overall condition of the floodplain to have become worse. The reasons for this are not clear, but considering the timing of the survey in August 2005 when relatively more jute had

been grown and there were problems with the quality of water in the beels and fish kills, the opinions may have been influenced by this. Although slightly more jute was also grown in Goakhola and Maliate, the increase was not so much and there the IFM project facilitated training and piloting of less harmful retting techniques and farmers avoided retting so much within the beel.

5.5 ASSESSMENT OF BEEL MANAGEMENT COMMITTEES

The most revealing evidence of differences that may affect the way that the CBOs function came from discussing with the committee members (i.e. women and men in Goakhola, women only in Maliate, and men only in Shuluar) what their criteria were for successful integrated floodplain resource management. The committees that included women identified more criteria (16 for Goakhola, 20 for Maliate), compared with just 10 in Shuluar, and the criteria differed (Table 19). All three agreed that strong leadership was the most important factor for success, but after that the CBOs with women members rated establishing the authority (legitimacy) of the CBO for resource management next (and that they had achieved this), while the men-only CBO emphasized establishing a fund for future activities (which they had yet to achieve).

Table 19 Local stakeholder criteria for successful Integrated Floodplain Management

Success criteria	Goakhola Beel		Maliate Beel		Shuluar Beel	
	Rank	Score	Rank	Score	Rank	Score
Strong leadership	1	++	1	+++	1	++
Established authority for resource management	2	++	2	+++		
Participatory decision making			3	+++		
Representation of different stakeholders			4	+++		
Social responsibility among community created	3	++				
All stakeholders aware about the project objective	4	+	20	+++		
Time maintenance for each activity	5	++	8	+++	10	-
Criteria for sustainability agreed	6	+++				
Fund created for future activities	7	- - -	9	+	2	---
Responsibility of each member of the management committee carried out	8	++				
Constitution prepared	9	+	11	++		
Community rules exist			12	+++	4	+++
Community compliance with rules			13	+++	5	+
Cooperation, unity, respect and perseverance among members strong	10	- -	14	+++	3	+
Members willing to provide own labor for development work	11	- -	15	+++		
Cooperation with other NGOs strong	12	+++	16	+++		
Committee registered	13	- - -	17	+++	6	+++
Regular meeting and 75% attendance	14	+++	18	+++	7	-
Resolution for each meeting exist and available	16	+++	19	+++		
Linkages with local government institutions			7	+++		
Management plans exist			5	+++	8	++
Implement management plans as scheduled			6	+++		

Score: rating of achievement of the BMC against these indicators in 2003, on scale of +++ (as good as possible) to - - - (as poor as possible).

Source: focus groups with BMC members only in 2003 (i.e. Goakhola mixed men and women, Maliate women only, Shuluar men only).

The women-only CBO placed as 3rd, 4th and 5th participatory decision making, representation of different stakeholders in decisions and having a management plan (and said they had achieved all of these). The mixed CBO emphasized social responsibility in the community, awareness among all the community and timely implementation of activities (and was partially satisfied it had achieved these). The all male CBO emphasized cooperation and respect among members of the committee,

establishing community rules, and compliance with the rules (and was also partially satisfied). Thus the women only CBO places greater value on participatory processes leading to its plans, the mixed CBO on whole community action and norms, and the male only CBO appears more of a membership organization setting rules that it sees as in the interests of the community.

6 EFFECTIVENESS OF MALE ONLY AND MALE-FEMALE COMMUNITY BASED ORGANIZATIONS

A total of 36 sites were studied in 2004 to investigate the development of community management institutions and associated indicators. All of the sites were under the Community Based Fisheries Management Project phase 2 (supported by the UK Department for International Development and implemented by WorldFish Center, Department of Fisheries and seven NGOs). The main focus was to investigate any impact of a participatory planning process known as Participatory Action Plan Development (PAPD)(Sultana and Thompson 2004). Half of the sites had at the early stage of CBFM a PAPD and the other 50% had all of the other project activities and NGO support but no PAPD. In addition 47% of the sites had women members of the management committees established for fishery/floodplain management - referred to here as Community Based Organizations (CBOs) (only one – Maliate Beel the subject of one of the case studies - is 100% female), and the rest were 100% male (Table 20). The PAPDs always included in its separate stakeholder planning groups a session with poor women, and were more likely to result in women being members of the CBOs (61% of these CBOs had female members) compared with sites where no PAPD was held.

Table 20 If Participatory Action Plan Development (PAPD) was used and whether women were involved in resulting Community Based Organizations (CBO) for fishery management.

	Men only CBO	CBO includes women	Total
No PAPD	12	6	18
PAPD	7	11	18
Total	19	17	36

Those CBOs with female members appeared to have taken slightly longer to establish (average of almost a year – 340 days from the date of NGO staff being fielded to date of CBO formation) than those with only men in the committees (average of 10 months). This is despite the use of PAPD being associated with faster formation of the CBOs, suggesting that building community organizations with multiple stakeholders takes longer. But this was partly compensated by the CBOs with female members taking only 3.5 months from formation to taking their first collective actions for resource management, compared with almost 6 months for male only CBOs (Table 21). However, the extent of women's involvement in these CBOs may not be high, as they averaged 90 persons (twice the size of the male only CBOs), and with no difference in the proportion who were landless (Table 22).

Table 21 Time taken to start up CBFM activities and institutions by composition of committee
No of days CBO formed after stating project

Composition of CBO		Days taken to form CBO	Days from CBO formation to first management activity
Only male	Mean	302	176
(N=19)	Std. Deviation	117	93
Includes women	Mean	340	106
(N=17)	Std. Deviation	110	85
All (N=36)	Mean	320	143
	Std. Deviation	114	95

Source: data collected for assessment of PAPD effectiveness.

Table 22 Number of primary groups of landless people formed by NGO for livelihood support and composition of CBO.

BMC composition		No. female groups	No. male groups	Total no. of members in CBO	Number of landless in the CBO	% landless in the CBO
Only men	Mean	2	6	46	7	15.1
(N=19)	Std. Dev	4	8	33	13	
Includes	Mean	4	5	90	14	15.9
women (N=17)	Std. Dev	4	7	67	14	
All (N=36)	Mean	3	5	66	10	15.6
	Std. Dev	4	7	56	14	

The management committees that were all male met marginally more frequently, but there was no difference in the number of awareness raising activities (although they were more varied where women were involved). Resources available from the partner NGOs to support both collective action to restore fisheries and for additional livelihood development were greater on average for the male only CBOs. Revolving funds equivalent to about US$ 1,760 were provided to the men-only CBOs compared with US$ 1,220 for sites with women in the CBOs (Table 23), and about three times more micro-credit was reportedly disbursed to the participants per site where there were men-only management committees compared with the mixed committees. Despite this similar numbers of awareness raising events were held but the mixed committees were involved in more types of events suggesting a broader approach and links with the wider local community.

Table 23 Level of activity and support for CBFM in sites.

Composition of committee		No. of CBO meetings per month	Number of awareness activities	No of types of awareness raising activities	Amount of revolving fund provided by NGO (Tk)
All male	Mean	0.75	10	4	105,770
(N=19)	Std. Dev	0.36	13	3	193,840
Include women	Mean	0.64	11	6	73,250
(N=17)	Std. Dev	0.19	10	5	157,280
Total (N=36)	Mean	0.70	10	5	90,410
	Std. Dev	0.29	12	4	175,790

Even so the male-only CBOs appeared to be more active in managing their fishery resources – having implemented on average 4.5 resource management actions after about two and a half years compared with an average of just under three actions per mixed CBO (Table 24). Smaller CBOs with lower diversity in their membership may be able to implement more of their plans in a limited time, but substantially more conflicts were reported in the sites with male only CBOs: six per site compared with two per site in the mixed gender CBOs.

Table 24: Conflicts and rule breaking

Composition of CBO		No. of fishery management actions done	No. internal conflicts	No. external conflicts	Total no. conflicts	% conflicts resolved	No. of rules	No. of rule breaking incidents
All male	Mean	4.67	2	5	6	37	2	7
(N=19)	Std. Dev	2.09	3	12	15	28	1	17
Include women	Mean	4.53	1	1	2	42	2	3
(N=17)	Std. Dev	1.75	2	1	3	42	1	9
Total (N=36)	Mean	4.60	1	3	4	39	2	5
	Std. Dev	1.91	3	9	11	33	1	14

However, there were reportedly fewer conflicts both within the participant community represented by the CBO and with outsiders where women were involved in the CBO, this is likely to reflect the tendency for these committees to involve not only women but also a range of (male) stakeholder representatives. Moreover all sites averaged about two fishing rules in operation (usually a closed season in the early monsoon to protect fish when breeding and a ban on some form of harmful gear), but twice as many rule breaking incidents were reported in the sites with men only CBOs. Thus the effectiveness of the institutions established appeared to be higher where the decisions were taken by a more gender balanced committee, which took longer to reach agreement among the whole community on actions and where women as well as men could presumably convince their neighbors to comply with decisions and rules to sustain the fisheries.

7 CONCLUSIONS

The three case studies show that while measuring impacts on fisheries and livelihoods from community based management initiatives is not easy and compounded by variability between years, the communities, both men and women, recognize gains and improvements in the health of the resource, and consequently are willing to adopt and comply with limits on their resource use. In each case the number of conflicts decreased over time and the BMCs have been recognized by and their plans accepted by the communities which now follow rules set by the BMCs. The number of rules introduced by the committee increased during the study for those involving women - Goakhola-Hatiara and Maliate Beels. The Maliate BMC has been more adaptable and slowly imposed rules and they also adjusted the rules between years. For example, if the members see small sized fish or new species in the closed season they have prolonged the closed period through motivational work with the community. They tell the community that the fish price will be higher after a month when fish size increases. The women usually take the initiative to tell each family and they convince family members to wait to catch fish. These initiatives are spontaneous and the community appreciates these initiatives.

Ability to establish community based organizations where women play an active or leading role is influenced by the local community norms and culture, and the acceptance of women's involvement in economic activities outside the home. In the study area this is greater among Hindu communities than in the Muslim dominated area where women do not normally have much if any say in public affairs. This is also affected by education levels – in Shuluar few women have attended school whereas the average education levels of women and men in the other two beels is almost the same. There appears to be a compounding effect of education, social norms, economic activity and mobility which constrain or permit women having equal roles with men in this type of institution for community natural resource management.

The status and recognition given by the local community and leaders to women reflects this experience and although hard to quantify was highlighted by women in focus group discussions. In Goakhola and Maliate women reported increasing recognition of their voices and willingness to listen to their opinions, this transferred into increased willingness of the women to join in and acceptance by men of their part in local institutions. For example, the female BMC members reported also belonging to several other local committees and institutions, and this was also shown by sample surveys. By comparison in Shuluar Beel women have not been given any place in the BMC by the men, who do not recognize the fact that some women do actually depend on using non-fish aquatic resources. Consequently women have no power or role in decision making, and although they recognize the value of fishery related rules, the BMC has not addressed many of their concerns.

It is also evident that facilitation by an NGO that focuses on women's development, as is the case in all three case studies, is not sufficient to ensure women's participation in decision making and community institutions, this is also affected by cultural norms and the extent that women and men directly use the resources.

While involvement of women in the Shuluar BMC may not have happened, in other CBFM sites (close to half of those covered in the wider study) some women are included in the management committees. Overall the case studies and the evidence from the 36 sites suggest that in the long term involving men or women or both may be no more or less effective in establishing norms and achieving improvements in resource management. However, although narrower based all male CBOs were effective at introducing resource management actions, they lack wider community support and so face greater problems of conflicts and poor compliance.

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CONTACT ADDRESSES

Parvin Sultana, Flood Hazard Research Centre, Middlesex University, Queensway, Enfield, EN3 4SA, UK (parvin@agni.com)

Paul Thompson, Flood Hazard Research Centre, Middlesex University, Queensway, Enfield, EN3 4SA, UK (paul@agni.com)