

Paul M. Thompson

Md. Nurul Islam

Md. Monjur Kadir

International Center for Living Aquatic Resources Management

House 75 Road 7 Block H, Banani, Dhaka 1213, Bangladesh

fax: +880 2 871151

email: iclarm@dhaka.agni.com

Impacts of government-NGO initiatives in community based fisheries management in Bangladesh

Stream: Fisheries

Discipline: Social science

Introduction

The four million ha of openwaters in Bangladesh are among the world's richest and most complex fisheries. The rivers, beels (lakes), baors (oxbow lakes), haors (large deeply flooded depressions), and floodplains support some 260 fish species (Rahman, 1989) and perhaps 10 million people earn an income from fish. Several studies, including FAP 16 (1995) and the study reported here, indicate that about 80% of rural households traditionally catch fish for food or to sell. Fish contribute about 60% of animal protein consumed (Islam, in press). Studies have shown that the many "miscellaneous" small fish caught from the floodplains and lakes by poor people, which have been neglected in official statistics and policies, provide relatively more essential nutrients than do the large fish favoured by fish culture programs (FAP 16 1995).

Fish habitat destruction due to roads, embankments, flood control and irrigation structures, and natural siltation, along with overfishing, have been commonly cited as major causes of the deterioration of the country's fisheries resources (Hughes *et al.*, 1994; Ali, 1997). However, an underlying factor has been a policy framework that has discouraged local institutions and traditional systems of fisheries protection and sustainable management.

The inland openwater fisheries of Bangladesh are common property and share two characteristics: it is costly to exclude potential users from gaining access to the resource, and each person's use of the resource subtracts from the potential welfare of others. Any solutions involve control of access to these fisheries and some form of institutional design to regulate use and minimise the subtractability problem. Exclusion may be addressed through defined areas where user groups or communities have exclusive fishing rights, or through licenses. Subtractability is addressed through rules which limit short-term individual interests in favour of long-term collective interest.

Openwater fisheries in Bangladesh are public property, and the government's traditional approach has been to sell (lease out) fishing rights in designated waterbodies for 1-3 years to private or corporate entities who thereby acquire exclusive rights to determine fishing access to the waterbody. Often these leaseholders allow as many fishers and collect as much rent (toll) as possible during the tenure of their lease. The 1950 Fish Conservation Act restricts certain gears and fishing for juvenile fish, and arose from government concern to protect long-term collective interest. Both leaseholders and fishers have been subject to the act, but its enforcement has been very weak and compliance equally poor in the absence of any cooperation from both leaseholders and fishers.

Several projects to improve management and production of common property fisheries have focused on stock enhancement of floodplains (Ali 1997; Islam in press) and Oxbow lakes (Apu *et al.* in press). At the same time, and in common with other countries (Pomeroy and Williams, 1994), there has also been emphasis on greater involvement of local communities and/or of poor fishers in management. In Bangladesh this has been facilitated by the activities of NGOs, often working with government. This paper discusses some of the early impacts of one such collaborative project.

Community Based Fisheries Management Project

The Community Based Fisheries Management (CBFM) project aims to bring about greater efficiency, equity and sustainability in inland openwater fisheries. The project has been designed as a pilot project to test alternative models of government-NGO cooperation in empowering fishing communities to manage local fishery resources. To achieve this the CBFM project started field activities in early 1996 and is working in 20 waterbodies of three main types (flowing river, open floodplain beel, and semi-closed beels and baors), and involves the Department of Fisheries (DOF) working with five NGOs, each with their own approach. These approaches, experiences and obstacles encountered are discussed in detail by Hossain and Rahman (1998). To support the work of DOF and the NGO partners, ICLARM has a coordination role and guides surveys and monitoring.

The approach of the NGO partners in general is to form groups of fishers meeting their own poverty criteria; to support these groups with education, training, credit, and raising awareness of fisheries management problems; and to help these fishers develop institutions and techniques for managing the fisheries. Hence direct impacts of the NGOs' activities should include access to credit (at lower interest rates than informal sources) and improved livelihoods through investments in new or existing enterprises. For CBFM the aim is to help the fishers' groups to organise or be represented in local management bodies for each of the project waterbodies, indicators of this include the establishment of such management bodies, and the level of participation of fishers in decision making regarding these fisheries. Ultimately it is expected that fishery management will be improved in the sense of sustainable fish catches at hopefully higher levels than in the recent past, and in terms of a more equitable distribution of returns, with less going to fisher leaders, middlemen, moneylenders and leaseholders.

Progress over approximately two years is discussed here, but must be placed in the context of a variably slow process of government and NGO collaboration in different sites. In particular late

hand over of waterbodies from the Ministry of Land to Department of Fisheries (Hossain and Rahman, 1998), which forms the basis for co-management under the project, meant that in some sites the partner NGOs were active for over one year without clear rights for the communities they work with to take management responsibilities. This is still the case in the rivers under the project. Two semi-closed beels were under the project from early 1996, and three more were added in mid 1997. Work started in two open beels in early 1996, in one in late 1996, and in one in mid 1997. NGO activities started in nine rivers in or before early 1996 and in one in late 1996, but in none of the rivers is there formal government recognition of community or DOF rights for co-management.

Methods

Action research under the CBFM project involves several separate surveys and studies, including baseline household surveys and follow up impact monitoring; monitoring of fishing effort and catches; monitoring of fish consumption; and process documentation. However, for several of these surveys only one year of data collection has been completed so far (1997) making conclusions difficult to reach, especially as improvements in fishery management only started to take place in 1997-98. Therefore this paper is limited to findings from household surveys and more general progress in establishing local fishery management bodies.

Households living in villages around the 15 waterbodies under the project at that time were interviewed in the second half of 1996. The partner NGOs involved are: Caritas in four beels and one river, Proshika in eight rivers, CRED in one river, and Banchte Shekha in one beel. In each waterbody separate random samples were taken of fishing households organised by the partner NGO in the project, and of other households which catch fish (mainly for food). In one sense the "non-NGO" households form a control sample for comparison with the direct participants of the NGO programs, but in another regard they too are intended to benefit as they are stakeholders in these fisheries and the aim of CBFM is to recognise the interests of all stakeholders in each fishery. Over 80% of households in the project communities fish at least occasionally. However, the partner NGOs have concentrated on organising poorer households which fish for an income, and on average have covered about 20% of households who ever fish in the project waterbodies. Fishing is mostly done by men in Bangladesh but women do fishing related work and sometimes catch fish, so separate interviews were taken with men and women in each household.

Household conditions, incomes and NGO support

Household characteristics

In Bangladesh traditional "full-time" fishers are largely Hindu and form a clearly defined community where cooperative fishing in teams is widespread. Consequently more of the NGO participants in the project locations are Hindu than among the non-NGO households (more of whom fish for food), but increasing numbers of Muslims have taken up the profession, particularly around beels (Table 1). Most non-NGO households around beels only fish for household consumption, whereas 52% of non-NGO households along rivers also earn an income from

fishing. Thus the level of dependence on fishing among households living near to rivers but not organised into NGO groups is relatively high.

Table 1. Characteristics of household heads.

Attribute					
		NGO	non-NGO	NGO	non-NGO
		287	294	552	600
Religion (%)	muslim	57	67	47	82
	hindu	43	33	53	18
Fishing (%)	full time	33	3	62	28
	part time	48	16	24	24
	subsistence	13	68	10	36
	not fish	5	13	4	13

The NGO-organised professional fishers on average are poorer than other households in the same communities, particularly in beel areas where more non-NGO households are farmers, own significantly more land, and have better houses on average (Table 2). There is less economic differentiation in the riverine communities where landholdings are smaller and the quality of housing higher than around the beels. The surveys confirm that the partner NGOs are targeting poorer fishers. This targeting, combined with NGO support having already been underway in some sites for several years, makes it difficult to conclude from comparisons with non-NGO households whether there has yet been an improvement in the lives of participant fishers.

Attribute				
	NGO hh	non-NGO	NGO hh	non-NGO
Number of households	287	294	552	600
Area of own land (ha)	0.28	0.59	0.16	0.36
Housing area (sq m)	25.7	30.4	21.2	24.2
% house walls made of tin/concrete	2	15	12	20
% house roof made of tin	43	64	75	71

Little difference in reported food security was found, except that the non-NGO households around beels (more of whom are farmers and who own on average substantially more cultivable

land) are less prone to suffer food deficits (Table 3). Yet fish consumption appears to be much more frequent among all households along the rivers (over 50% of households eat fish at least once a week compared with 30-40% in the beels), since fish are caught throughout the year, whereas they are a seasonal resource in the beels.

		NGO hh	non-NGO	NGO hh	non-NGO
		287	294	552	600
		2.33	1.74	2.48	2.35
Percentage	usually deficit	37	29	38	42
	occasional deficit	41	31	45	37
	break even	18	24	13	14
	surplus	3	13	3	7

Incomes

In the initial period of the project participants in the beels owned relatively low value fishing gears (mostly operated individually), while in the rivers more households owned higher value gears, often shared (Table 4). Linked with this average household incomes from fishing among NGO participants in the rivers were almost double those among beel households, although total household and per capita incomes were not significantly different. The NGO participant households were expected to be poorer than a random sample of other households, but in the rivers NGO participants are slightly better off - in these areas professional fishers are not necessarily poor. In addition, on average they had received NGO assistance for longer than had the beel households (see below), which may have enhanced their incomes. Even among NGO participants in the rivers fishing contributes little over half of household incomes indicating that many professional fishing households have diversified to some extent.

Attribute	NGO hh	non-NGO	NGO hh	non-NGO
		280	292	542
	1,880	658	10,164	3,188
	8,834	2,326	16,128	6,832
Household total income (Tk)	22,271	28,634	28,621	24,035

		4,330	5,515	4,743	4,221
Income (%) source	fishing	43	10	57	31
	other fish related	1	3	9	3
	agriculture	18	34	11	25
	livestock	4	5	2	3
	labour	15	17	8	16
	handicraft/trade	12	9	6	10
	business/service	2	18	5	9
	other	5	5	3	4

NGO support

The main target for support from the NGO partners in the CBFM project are male fishers, but the NGOs also work with women in these areas as part of their normal programs and have formed some women's groups linked with the project. All NGO participant households are expected to be members of groups organised by the NGO partners, but a few households had dropped out in the first year. Also households are not, according to NGO rules, supposed to belong to more than one NGO, but (when cooperatives and Grameen Bank are included) up to 17% belonged to another organisation (Table 5). In some cases this is because fishers had been organised recently for CBFM when some already belonged to other NGOs. Thus in the beels the participant households had on average belonged to the partner NGO for just over a year (although women from the same households involved in the same NGOs had been members for longer). In the rivers participants had already been members of the partner NGOs for on average almost four years. It was apparent, however, that male respondents were not familiar with the involvement in NGO supported activities of women from their households.

		hh		hh		hh		hh	wom
		wo		wo		wo			
		m		m		m			
		290	288	300	295	552	541	600	588
		99	47	6	18	99	25	5	10
		17	8	28	8	12	19	9	13
Partner NGO	average years	1.3	3.3	1.7	3.2	3.9	3.4	3.0	3.6
	average savings Tk/hh	205	529	666	726	140	610	906	804
	average loans Tk/hh	154	837	660	740	616	549	401	6217
		3	6	0	0	9	9	0	
Other NGO	average years	2.4	0.6	3.6	1.1	3.6	1.9	3.5	2.7

average savings Tk/hh	534	152		166	606	663	671	824
			106					
			4					
average loans Tk/hh								6964
	342	116	713	227	416	640	718	
	8	3	8	6	1	5	2	

hh = household (reported by male respondents, supposed to include women of household),

wom = women (reported by female respondents only for women in household)

Households were categorised into those who fish for an income (combining full and part-time fishing), and those who fish for food (non-fishing households were excluded from the sample). The NGOs have been effective in targeting those who fish for a livelihood, although 15% of their participants around beels and 11% along rivers only report fishing for food (but Proshika's fisheries program along rivers includes fish traders and processors). By comparison only 24% of non-NGO households who fish around beels fish for an income, and 56% of non-NGO households who fish along rivers fish for an income.

An important aspect of NGO support in the project is training and credit for additional livelihoods and as an alternative to dependence on moneylenders for purchase of gear and working capital for fishing. In the previous 12 months on average 50% or more of households had taken credit, and some had also sold assets either to invest or meet immediate needs. Only for the riverine NGO participants was this money used for fishing by a majority of households, and (with very little land) these households were more dependent on and took relatively large amounts of credit (Table 6). In the rivers NGO credit linked with CBFM does appear to have substituted for loans from moneylenders, but has not eliminated their role. Credit from moneylenders is often tied with fish marketing and/or with access to the fishery either through leasing, other tolls, or harvesting brush piles (*kathas*). In the beels fewer participants were eligible for credit in the first year, but the second most common use was fishery related and these households due to poverty had limited potential to access formal credit.

		NGO hh	non-NGO	NGO hh	non-NGO
		290	300	552	600
		23	29	13	14
		50	48	67	50
		2778	6377	6303	5497
Source of funds (%)	asset sale	34	30	16	22
	land mortgage	8	14	6	10
	bank loan	17	25	7	8

NGO loan	17	12	31	6
moneylender	4	3	19	29
other loan	21	15	21	25
% households using funds for fishing	39	3	75	33

Participation in NGO programs appears to have little or no effect on the use made of income earned by women, over 50% is used to meet family needs. In general a slightly higher proportion of this income in NGO participant households was used to buy productive assets (such as livestock), but in only six sites was over 15% of women's income in NGO households used to buy assets (for non-NGO households over 15% of income was used for this in only three sites). Loan servicing appears to be a greater demand on women's earnings in the rivers both among NGO participants and other households.

Fisheries involvement and opinions on management

Fishing activity and conditions faced

Households fishing for an income, but more particularly the NGO participants, tend to fish in teams usually using large seine nets, which are often not owned by the full team, with the gear owners receiving an extra share of the catch. Team fishing of this type is associated with traditional fishing communities, for example more NGO participants fishing for income in the beels inherited their occupation than did non-NGO members fishing for income in the same beels (Table 7). Also a majority of these professional fishers targeted by the NGOs had to pay to fish in the previous year, whereas many fewer other fishers had to pay. Households which only fish for food reported fishing activity in a surprisingly high number of months. The relatively lower use of project waterbodies by non-NGO households fishing for food suggests that they were being discouraged from fishing (distance was not a factor since they came from the same villages) either by people outside of the CBFM project trying to retain control of fisheries (such as ex-leaseholders in the rivers), or by the participants in the beels. However, in the beels the partner NGOs during the first year had not included some professional fishers as participants and they are (at least in some cases) excluded from the beels.

Table 7. Involvement of households in fishing.

	NGO	non-NGO	NGO	non-NGO	NGO	non-NGO	NGO	non-NGO
Number of households	241	68	43	218	484	332	61	260

	15.2	10.5	4.7	2.7	18.9	14.6	4.9	1.9
	50	16	2	0	66	56	0	0
	43	21	5	1	60	32	13	0
	77	33	11	4	61	35	10	2
	6.2	3.9	5.1	2.7	9.5	7.9	6.5	5.2
months pa fished elsewhere	3.8	4.6	2.3	3.1	2.2	1.4	1.8	1.9

In 1995-96 (the first year of CBFM activities), previous leaseholders were still in possession of several waterbodies and (legally or illegally) collected tolls from fishers, also several waterbodies were under the earlier DOF managed licensing system. Consequently most fishers already faced restrictions on fishing, although these varied greatly between sites. Over half of all fishers (mostly people who fish for an income) reported that they had to pay to fish (either to government directly or to leaseholders) in the previous year (which was a transition year in rivers as free access was only introduced about 12 month before the survey), and existing leases would not have been terminated immediately. Fewer non-NGO households reported paying to fish, but this was still the main restriction they faced. Otherwise closed seasons were reported in some beels (Table 8), but very few fishers reported any gear restrictions even though national policy is that some gears such as current nets (nylon monofilament gill nets) are banned. Only in one beel (Hamil beel) were restrictions set by the fishers (beel management committee) supported by the NGO. In a few cases subsistence fishers referred to free fishing for consumption being permitted by the local community.

Attribute					
		NGO	non-NGO	NGO	non-NGO
		284	286	545	592
		70	71	62	49
Restriction type (%)	consumption only	1	6	1	11
	season	24	11	1	3
	gear	2	2	5	2
	area	0	2	3	3
	fee	52	47	54	36
	other	9	9	2	0

Note: percentages are of all households and are separate for each restriction.

Participation of women in fishery activities

In general women were found not to actively fish, but more are reported to fish for an income in the rivers than beels, while in the beels a substantial minority of women fish for food especially in the NGO households (Table 9). However, women's participation in all fishery related activities differs greatly between sites. In Rajdhola beel and Goakhola-Hatiara beel (both sites where all

NGO participants are hindu) women in 88% and 97% respectively of NGO households fish for household consumption, though virtually none fish for an income. Apart from Ubdakhali river (where women in 70% of NGO households (98% hindu) fish for an income) in all other waterbodies women actively fish in under 20% of households. In general for women the main sources of income related to fishing are net making/repairing and drying/processing fish, and these are only substantial income sources in some of the rivers, most notably in Boyrala river where in over 75% of NGO participant households the women earn from net making and drying fish, with an average household income from the work of these women of over Tk 3,000 a year. It would appear that households have considerable scope to increase women's involvement in fishery related work if they want to.

Attribute		NGO		NGO	
		hh	non-NGO	hh	non-NGO
		287	289	541	588
		36	3	179	102
		13	1	33	17
		1703	2600	2126	1766
For income (%)	fish	1	1	9	5
	net make	4	0	20	12
	trap make	0	0	2	1
	dry fish	29	0	19	17
For household (%)	fish	38	17	12	8
	net make	19	3	42	30
	trap make	1	0	4	3
	dry fish	4	2	30	34

Opinions on fishery problems and management

There is wide recognition of problems facing these fisheries, and the vast majority of respondents reported that fish are declining (Table 10), although this may more likely relate to declining catches relative to fishing effort. The common reasons given were destructive gear (most

common), too many people fishing (especially in rivers), and reduced water area (especially in beels, but also in some of the rivers), in addition fish disease (epizootic ulcerative syndrome) was reported to be a problem in some beels. In each site there was clearer agreement on the causes of decline.

More of the NGO organised fishers around beels (73%) than rivers (53%) believe they can manage the fisheries better than so far, as they have already received training. However, at an early stage of the project in the beels a majority of fishers said their voices were not heard in fishery management (particularly non-NGO fishers). There was no clear pattern in the rivers despite the fact that there were no management systems or participation mechanisms in place (Table 11). Views on compliance with fishing traditions were mixed, and may reflect the legacy of leasing plus complex informal practices among fishers. However, only 10-20% of fishers were in favour of restrictions on where they fish, indicating potential opposition to sanctuaries, whereas opinions were divided on gear restrictions. Hence fisher participation in management in these waterbodies was less than the fishers felt capable of, but despite initial work by the NGOs there was only limited support for fishing restrictions.

	NGO	non-NGO	NGO	non-NGO
	283	286	539	572
	92	87	98	91
	48	44	79	75
	69	66	92	85
	69	61	54	54
disease	23	19	6	4
*	6	6	1	2
	1	2	2	1
other	13	8	1	2

* disease and reasons below it were volunteered.

Waterbody type	Beel	River
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		NGO		NGO	
			non-NG		non-NG
		285	O 292	538	O 574
Fishers' voices heard (%)	agree	45	16	48	34
	disagree	49	69	31	40
Know how to manage better (%)	agree	73	49	53	57
	disagree	7	22	17	19
People not respect fishing traditions (%)	agree	30	24	25	27
	disagree	42	44	40	33
Should fish where like (%)	agree	85	72	81	81
	disagree	13	20	9	11
Should use whatever gear like (%)	agree	55	47	39	40
	disagree	42	44	52	55

Note: % of respondents who were undecided or neutral not shown in table.

Respondents (men and women from the same households) were asked what measures were needed for better management of the respective fishery. There was generally close agreement between both NGO and non-NGO participants in a given site on the measures most needed, but the overall percentages mask important differences between individual waterbodies. Stocking fish was widely suggested by men and women to improve management (Table 12) but it may not imply that communities are willing to invest in stocking (since there has been government sponsored stocking in the past in or near several of the waterbodies). In the rivers fishers (and their wives) want restrictions on gears which they consider harmful (including brushpiles or *kathas* which are a widespread means for local landowners to obtain rights over parts of the fishery). However, the men in particular also identified lack of secure access rights under a free access system as a problem, while women gave more emphasis to re-excavation. In the beels measures to restore fish habitat, and to retain water (embankments) and fish, are favoured; women gave relatively more weight to having guards for fish possibly indicating lack of awareness of the approach of voluntary compliance plus community guarding. There were no significant differences in opinions on fishery management between NGO and non-NGO households indicating common agreement on possible measures and that NGO awareness raising had not resulted in different opinions among their participants.

Waterbody type	Household type							
		men		men		me		men
	wome		wome	wome	me	wome		
	n	n	n	n	n	n	n	
No households	275	277	261	270	492	537	507	576
Stocking	75	71	71	65	58	45	52	46
Re-excavation	26	36	35	35	34	25	36	29

CBFM/unite fishers	30	16	28	18	2	13	0	3
Embankment + maintenance	20	23	14	17	1	5	3	7
Guards	20	8	20	12	3	5	0	3
Protect fish (season/gear)	0	9	0	8	45	39	41	36
Stop katha	0	0	0	0	10	22	7	16
Access for fishers	0	4	0	6	15	24	10	22
Feed fish	11	0	10	0	0	0	0	0
Sluice gate	1	20	1	21	0	12	0	7

Note: up to three responses per respondent could be given. Responses given by under 10% of respondents in all categories not reported.

These opinions are being fed back into community decisions on fishery management. Interest and capability in fisheries management are being raised among local organisations and communities through NGO activities and regular monitoring and feedback systems which aim to bring potential co-managers together to make informed management decisions.

Progress and impacts of fishery management bodies

Raising community awareness of fishery problems and potential solutions through community limits on fishing, and support to enhance incomes of fishers and reduce dependence on middlemen and moneylenders are important activities of the project. To achieve CBFM also requires that communities develop local institutions which promote sustainable fishing by defining who can fish where and at what times. It may also involve community investments in enhancing fish stocks. A key step in achieving this is for communities to have some forum or body which can take decisions and coordinate fishery management, since all of the waterbodies concerned are exploited by people from several villages (minimum of four, maximum of over 20). Representation of different stakeholders is an issue, for example people who fish for an income, who fish for food, who process or market fish, or who invest in *kathas* or other fish aggregating devices, farmers, boat operators, and local government are all stakeholders in the fisheries.

Semi-closed beels

Progress in the six bounded beels and baors has been more rapid. In all there is some form of "Beel Management Committee", but in all cases this comprises only fishers representing each of the NGO organised groups of fishers. In the semi-closed beels groups of fishers have established exclusive rights over the fishery. In four cases this has built on an existing fishers cooperative, in

the two other sites the groups cover the whole of a traditional hindu fishing community who previously worked on a share basis for an outsider who held the lease, or who were in conflict with richer muslims who tried to take control of the resource. In these beels management is through annual stocking of carps which then grow during the monsoon season and are harvested in the post-monsoon and winter. In all cases the fishers now benefit from technical advice and are represented in a management committee of leaders of groups of participants (in three the office bearers have been elected by the participants), the fishers also have access to credit from the NGOs which frees them of ties to middlemen and traders who before often controlled either fingerling supply or marketing of fish. Important improvements in equity have been achieved: the participants share equally in the investment costs, in guarding the stocked fish, and in harvesting; but this has been at the expense of reduced access for subsistence fishing for non-members. In most cases it is too early to compare production under CBFM with earlier production (which was also based on stocking). In Hamil Beel, at 16 ha the smallest fishery in the project, a homogeneous community of people who already had fishing rights over the beel are involved and were immediately able to gain from the project in 1996 resulting in a four fold increase in production and an equitable distribution of income from fish harvest.

Open floodplain beels

Only four open floodplain beels are covered by the project, and one has an enclosed area which was included in the closed beel category. In each of these beels part of the area is permanent water, but much is private cultivated land which is seasonally flooded. Beel Management Committees (BMC) have also been established, but the experience is more mixed reflecting the extensive use of these fisheries for subsistence fishing, a wide range of stakeholders, and their capture fishery nature where property rights are not clearly defined, examples from three beels are given.

In two beels the partner NGO has only involved fishers organised in its own groups in the BMC - where each group organised by the NGO is represented. In one of these beels most of the households fishing for an income are members of the NGO groups and have over time reached a consensus to conserve fish and have successfully established a sanctuary and achieved roughly a two-thirds reduction in fishing effort during a three month voluntary closed season in 1997 to permit natural fish to reproduce, with reported gains in catches and social cohesion. In the other of these beels the fishing community was more factionalised, and the organised fishers have left substantial control of the fishery in the hands of previous fisher leaders who sub-lease from the fishers part of the waterbody in return for controlling access and a commitment to pay government revenue. In a third seasonal beel the partner NGO works with women as its direct participants (and in this hindu community women are more involved in seasonal fishing than in any of the other project working areas). Although this smaller NGO has the most focused target group orientation, it has been flexible and helped establish a management committee which also includes male fisher representatives, landowners and local leaders. This committee is now working to balance operation of the sluice connecting the beel and river in the interests of both fish and agriculture, to protect five ditches as fish sanctuaries, and to have a voluntary closed season to permit wild fish to breed. Importantly in all of these waterbodies the organised fishing community have accepted fishing for food by other members of the wider local community (which was also

previous practice). However, in each case there is a tendency for the NGO participants and the NGOs to look for production enhancements, and this may in future result in more barriers to fish movement and to fishing access.

Rivers

Since rivers were made free access resources by the government in 1995 (ending previous leasing to middlemen who then collected tolls from fishers, and past experiments with DOF licensing), there has been no formal basis for establishing territorial use rights. In one of the smaller CBFM project rivers a local NGO with strong links with local councils and leaders has established a management committee incorporating these local leaders and fishers. By convincing these groups, despite the lack of any official government support, some of the participants have cultivated fish in a pen in the river during the dry season, but this only benefitted a limited number of people and faced some technical problems. Then in early 1998 the community and its leaders agreed to set up a local fish sanctuary to protect brood stock of wild fish. The fishers in this river have less direct involvement in management than in the beels, but so far seem happy with the improvements achieved by local leaders.

In the other nine rivers there has been limited progress. NGO partners were reluctant to work with other members of the community who are not participants in their groups, while DOF was reluctant to take a lead in developing local management committees as it had no clear instruction from central government and could expect no formal administrative support. Furthermore, in all of these rivers there are strong divisions and conflicts among stakeholders. The target of the NGOs has been to mobilise traditional (largely hindu) fishing communities, but their position in the fisheries has been eroded, steadily in the past and more rapidly since 1995, by:

- 1 richer landowners investing in *kathas* (brushpiles which act as fish shelters) by which they gain exclusive control of small areas of river;
- 2 increasing numbers of non-traditional part time and subsistence fishers using low cost gears;
- 3 attempts by other influential groups to gain control of the whole river, for example associations of "Freedom Fighters", and outside associations of fishers.

In 1998 DOF and the NGOs agreed to facilitate the establishment of management committees involving all the stakeholders, with the aims of reducing conflicts, encouraging compliance with national restrictions on harmful gear, and possibly introducing local fish conservation measures.

Achievements perceived by local communities

Although major impacts of CBFM could not be expected after only 1-2 years, some impacts were monitored in late 1997 to guide project implementation. At the same time interviews were held using a ten point scale developed for similar assessments in the Philippines, whereby respondents could report changes in the status of a number of indicators of the performance of the incipient co-management arrangements under the CBFM project. Respondents were asked to compare the

present (late 1997) with two years earlier (just prior to the start of most NGO activities under CBFM project). Table 13 summarises the results by showing the number of waterbodies where there were significant changes in these perceived indicators. NGO activities appear to have had no clear impact on general participation of their members in community decision making, but have had a positive impact on levels of fishery participation among NGO members in all waterbodies (but did not benefit non-NGO households). Perceived influence over fisheries management had, however, not improved as widely even for NGO households.

The waterbody management bodies (committees) and co-management arrangements are supposed to improve conflict resolution and to make decision making easier (a measure of the efficiency of co-management), and this appears to have happened in the closed beels where CBFM was most advanced. However, there appeared not to be significant improvements in perceived well being of these fisheries, which reflects limited active management other than stocking which had already been practised in the closed beels. Improvements in household conditions occurred for both NGO and non-NGO participants and may not be linked with fishery management.

Finally, Table 13 highlights the need for clear property rights and public policy support for CBFM. Despite NGO participants in the rivers feeling that they can participate more in their management because of the project, there was no change or even a significant decline in other indicators which reflects open access arrangement and increasing pressure on these resources from non-traditional fishers.

Table 13. Changes in indicators of co-management 1995-1997 (number of waterbodies with a significant change in mean score for indicator).

Indicator	1995		1996		1997	
	NGO	non-NGO	NGO	non-NGO	NGO	non-NGO
General participation	-1+1	+1	-1+1	+2	1	-1
Fisheries participation	+2	+1	+2	+1	+3	0
Fisheries influence	+2	+1	+1	+1	+1	-1+1
Ease of decision making	+2	+1	+1	+1	-1+1	0
Fishery well being	+1	+2	+1	0	0	-1

Household well being	+2	+2	+2	+2	-2+1	-2+1
Household income	+1	+1	+2	+2	-2+1	-2

Note: in two closed beels, two open beels and three rivers, samples of 60 NGO and 60 non-NGO respondents were asked to indicate on a 10 point scale from the best to worst imaginable situations the current situation for each indicator (in late 1997) and the situation two years earlier. Negative numbers indicate the number of waterbodies where there was a significant ($p < 0.05$) decrease in the mean value of the perceived indicator over the two years, positive numbers indicate the number of waterbodies where there was a significant ($p < 0.05$) increase in the mean value of the perceived indicator over the two years.

Lessons

Based on surveys of fishing households both organised by NGOs and others, and on the initial experience of local management bodies, some lessons can be drawn. The project is incorporating these into current and proposed activities.

- 1 Establishing CBFM is a lengthy process where the fishers lack earlier organisations or institutions regarding access to the fishery. Major benefits should not be expected within 1-2 years, for example fisher incomes were not notably higher in the first year (but further monitoring is indicating some material benefits, at least in beels where stocked fish production has increased).
- 2 The fishers have a good understanding of the problems facing their fisheries, and of possible improvements in management, but lack (especially in the rivers) incentives and past experience of cooperating.
- 3 Ad hoc government policies and lack of coordination, and a reluctance to support local communities establishing rights over open fisheries, are serious limits. Some parts of the government machinery appear not to recognise that they have agreed to establish genuine local co-management arrangements between government and fishing communities, for which the communities need support and rights.
- 4 While the focus of NGOs has been on poor people who fish for their livelihood, and the NGOs have considerable advantages in working with fishers compared with government alone, in openwater fisheries the NGOs cannot expect that its participants will have exclusive rights over fisheries and need to be more flexible to also assist communities to develop their own institutions and organisations for fishery management, which include other stakeholders.
- 5 NGO support in the form of training and credit for productive enterprises has helped, even if incomes are not substantially higher. It gives poor fishers an option to reduce their ties to middlemen and moneylenders both in rivers and when stocking beels. It also helps

fishers gain extra sources of income which encourages them to agree to fishing restrictions (seasonal bans or sanctuaries).

- 6 Establishing community management has progressed faster where there is a well defined community and waterbody, and there are few conflicts or factions within the community.
- 7 A clear intervention or introduction of an improved production technology forms a focus for fishers to work together in the expectation of a tangible benefit. Something visible, such as a sanctuary or fish pen, acts as a flagship for communities to work together.

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