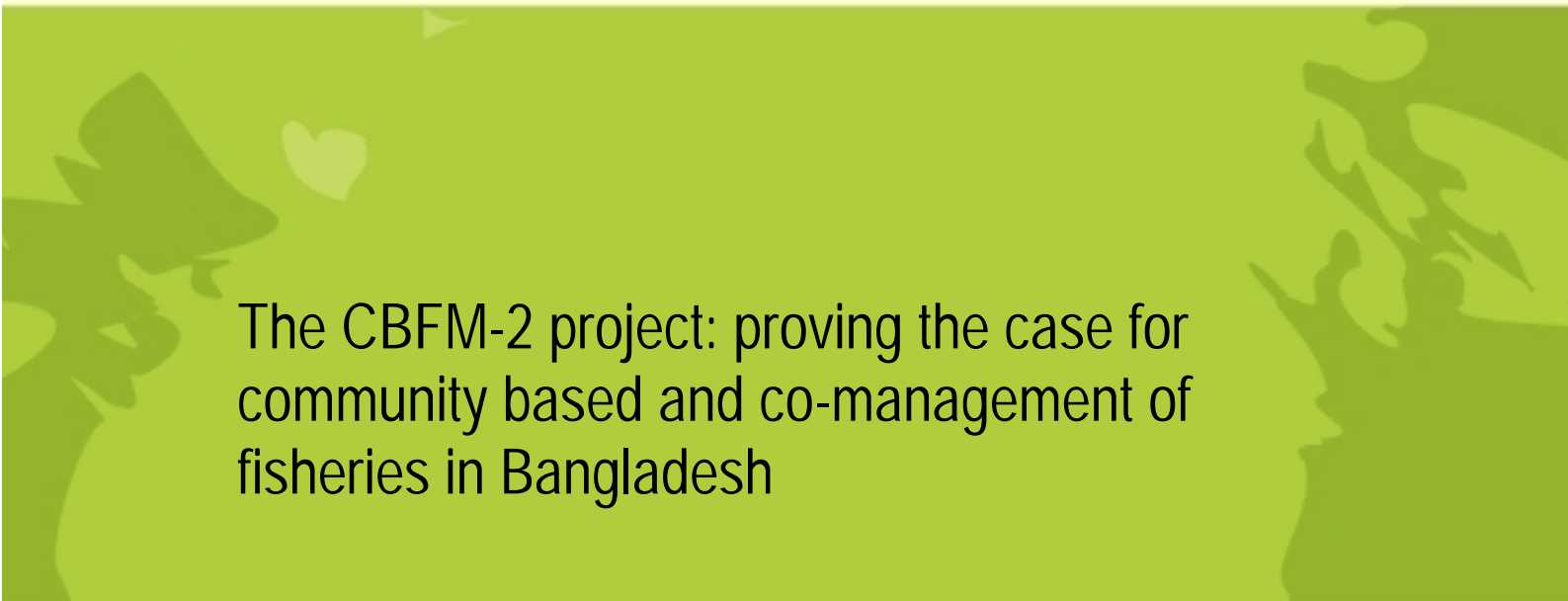


Conference Paper 01

The background of the title section is a solid green color. It features faint, light-colored silhouettes of people's profiles and a heart shape, suggesting a focus on community and human interaction.

## The CBFM-2 project: proving the case for community based and co-management of fisheries in Bangladesh

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## ABSTRACT

The Community Based Fisheries Management Project, Phase 2 has been implemented by the Department of Fisheries of the Government of Bangladesh with the assistance of the WorldFish Center over the period 2001 to 2007. This paper gives an outline of the main principles behind the project and the activities carried out during its implementation. The project involved a wide range of partners including 11 NGOs who were responsible for the identification and development of 130 community based organisations managing 116 water bodies including closed beels, open beels, rivers and floodplains.

The paper summarises the success of the project from different viewpoints. It also discusses some of the situations where community management did not work under CBFM-2 and emphasises the need for further research to build on the start made under this project.

## INTRODUCTION

The Community Based Fisheries Management Project, Phase 2 is closing in March 2007 following an implementation period of 5 years and 7 months. This was the largest and most comprehensive research project ever carried out to assess a range of approaches towards community based management of fisheries resources in inland water bodies.

It followed a five year first phase of CBFM where community management was tested in 19 sites. The first phase, supported by the Ford Foundation was able to demonstrate that CBFM approaches can work. The second phase was designed as an action research project to look in more detail at the situations where CBFM approaches should be applied more extensively. It saw an expansion to around 120 sites including lakes (closed beels and open beels), rivers and floodplains. It is important to put this into context – 120 sites sounds like quite a large number but there are an estimated 12,000 government owned water bodies in Bangladesh and a further 4 million hectares of floodplains which could benefit from improved management.

## WHY COMMUNITY BASED AND CO-MANAGED APPROACHES?

According to Robert Pomeroy (Pomeroy and Ahmed, 2006), the potential advantages of co-management include:

- A more transparent, accountable and autonomous management system.
- A more democratic and participatory system.
- More economical than centralized management systems, requiring less to be spent on management administration and enforcement, in the long run.
- Through involvement in management, fishers take responsibility for a number of managerial functions.

- Makes maximum use of indigenous knowledge and expertise to provide information on the resource base and to complement scientific information for management.
- Improved stewardship of aquatic and coastal resources and management.
- Management is accountable to local areas. Fishing communities are able to devise and administer management plans and regulatory measures that are more appropriate to local conditions. (Localized solutions to local problems).
- By giving the fishers a sense of ownership over the resource, co-management provides a powerful incentive for them to view the resource as a long-term asset rather than to discount its future returns.
- Various interests and stakeholders are brought together to provide a more comprehensive understanding of the resources.
- Since the community is involved in the formulation and implementation of co-management measures, a higher degree of acceptability, legitimacy and compliance to plans and regulations can be expected.
- Community members can enforce standards of behaviour more effectively than bureaucracies can.
- Increased communication and understanding among all concerned can minimize social conflict and maintain or improve social cohesion in the community.

Implicit in this is that co-management should result in measurable improvements in fisheries – improved yields, more resilient to environmental changes, more sustainable – and this will result in enhanced livelihoods of people involved in exploiting the fisheries.

The project not only tested different types of approaches to fisheries management, including fisher managed fisheries, community managed fisheries and women managed fisheries, but was spread across a wide range of very different types of fisheries, some government owned and leased jalmohals (closed and open beels), some government owned but without any leasing arrangement (rivers) and privately owned water bodies such as floodplains.

## PARTNER NGOS

Another layer of complexity was added by encouraging a wide range of partner NGOs to participate in the process of water body identification, community group formation and continued support to community groups through training, mentoring and micro-credit. Each of these brought their own approaches and priorities:

- BRAC is the largest NGO in Bangladesh and has been actively involved in fisheries, micro-credit and community management for many years. They were involved in the first phase of the project and in the second phase, tended to concentrate on jalmohal sites that could be managed by groups of fishermen.

- CARITAS is an international Christian NGO and was also involved in CBFM-1. They became involved in a mixture of closed beel, open beel and floodplain sites.
- Proshika is one of the larger Bangladeshi NGOs and were also involved in CBFM-1. In CBFM-2 they concentrated mainly on riverine sites but were also responsible for some open beel (jalmohal) sites.
- CRED is a small NGO that was involved in a single riverine site in the first phase. In the second phase they took on one additional open beel site.
- Banchte Shekha is an NGO based in Jessore that concentrates on empowerment of women. They were involved in a single site in the first phase and expanded to 7 other sites in the second phase. Some of the CBFM-2 community groups formed by Banchte Shekha are composed of only women, others were mixed but tended to have greater involvement of women than any of the other CBOs under the project.
- The Centre for Natural Resource Studies (CNRS) is based in Bangladesh and has always focused on protection of wetlands rather than activities such as micro-credit. They were not involved in the first phase but were doing similar things in another project. They tended to concentrate on floodplain and river sites, placing emphasis on wider community involvement and linking community groups into clusters. Whereas most of the NGOs organised and registered single CBOs for each water body, CNRS registered multiple CBOs at some of the larger water bodies and also have sites where only one CBO has been formed for a number of water bodies. This makes it essential to distinguish between “water bodies” and “CBOs” when carrying out any analysis.

The project also involved two specialist NGOs, the Bangladesh Environmental Lawyers Association (BELA) who provided legal advice and support throughout the project and FemCom who provided media and folk talent support.

As well as these initial partner NGOs, a number of other NGOs became involved with the programme at a later stage. These include SDC which was involved in a single floodplain site, GHARONI which worked with 3 floodplain sites and SHISUK which specialised in floodplain aquaculture and had one site included in CBFM-2. The Department of Fisheries also took direct responsibility for the development of 2 sites.

## PROJECT ACTIVITIES

The first task was to identify water bodies to be taken on by the project. This was carried out through collaboration between the Department of Fisheries, partner NGOs and the WorldFish Center.

The next steps were:

- Census of households
- Hand-over of water bodies from the Ministry of Land to the Ministry of Fisheries and Livestock

- Registration of CBOs
- Training of CBOs
- Developing and implementing fisheries management plans including constructing fish sanctuaries, imposing gear bans, enforcing closed seasons and carrying out habitat restoration
- Signing MoAs with DoF
- Providing micro-credit
- Building community centres
- Linking CBOs through networking

The end result is 130 CBOs actively managing 116 water bodies spread over most of the country. There are approximately 15,000 CBO members directly involved in the project and an estimated 23,000 people who could be classed as direct beneficiaries. The project employed a total of 204 staff. It built 99 community centres. Community groups have constructed 164 sanctuaries in 81 water bodies. Partner NGOs have delivered almost 1000 courses to over 23,000 trainees.

## DOES CBFM WORK?

At the end of all this, the question which is always asked is: “Does CBFM work?”

The short answer is: “Yes it does – the project has demonstrated that in most cases community management has improved yields and the sustainability of fisheries and has also enhanced the livelihoods of households participating in management of the fisheries.”

Much more detail is given in other papers in these proceedings and in the reports, policy briefs and booklets by the project (Annex 1).

To give a more precise answer, one needs to go back a step and determine from whose perspective the question is being asked. This is a situation where different people have very different expectations and indicators of success and in the words of Robert Chambers: “Whose reality counts?”

An objective assessment is also prejudiced by the fact that for many people, community based management is so clearly the right thing to do. Intuitively we know that local control over natural resources must be the way forwards. It must make sense to replace ineffective policing as the main approach to preserving fisheries with self-policing by people who have the most to gain from their sustainable management.

From the point of view of the fisheries scientist, the CBFM-2 project has clearly demonstrated that at most sites, the condition of the fisheries were improved by community management. The third paper in these proceedings contains more detailed information on this but it is worth emphasising the simple fact that despite all the variability and problems during implementation, the conclusion is clearly positive. According to the fisheries consultant, Ashley

Halls, this is the first time that this simple fact has been clearly proven – community management improves fisheries.

From the point of view of a socio-economist, the situation is a bit more complicated. Measuring fish stocks is hard enough but determining real project impacts on household incomes and livelihoods is even more difficult because it is not so direct. The fourth paper in these proceedings has more details on this aspect of the project. It was complicated by the rapid improvements in household incomes in many rural households however the project was able to show positive impacts in many sites and shed light on key issues that need to be addressed in future programmes.

From the point of view of the Department of Fisheries (DoF) and the Government of Bangladesh, community management offers a way forwards to improve the management of inland open waters. It is a way to halt what is often seen as an inevitable process of environmental degradation, while at the same time benefiting communities. In Bangladesh this is a huge resource with great political significance. The DoF has been involved in community managed approaches for at least 15 years and has now incorporated CBFM-type approaches into its Inland Capture Fisheries Strategy and PRSP implementation plans. There was universal support for expansion of community managed approaches at policy level workshops and round tables in 2006 and this is now being followed up by proposals for donor support to do this.

From the point of view of the donor, DFID, the project has been a clear success. The Project Completion Review gave the project scores at the purpose and output levels of 2 (Likely to be largely achieved).

#### **Project Objectives**

Purpose: A process for policy formulation for pro-poor sustainable fisheries management agreed and operational.

Output 1: Community based fisheries management approaches developed and tested, and their impacts, sustainability and potential for expansion assessed.

Output 2: Co-ordination and administration mechanisms for linking local community management arrangements within larger fishery and wetland systems identified, tested and assessed, and constraints to this identified.

Output 3: To inform and influence all fisheries policy stakeholders of improved management approaches.

Clearly the project was designed to be part of a process. It was a pilot scale intervention to test approaches that could then be applied on a wider basis. If DFID's funding priorities had not changed radically during the project implementation period, they would almost certainly be backing this expansion, however they have changed and there will not be a DFID funded CBFM-3.

This does not mean that the lessons learnt cannot be used by other programmes – the paper by Arne Andreasson in these proceedings spells out some of the likely next steps for the sector.

Of course the most important point of view is that of the people who have invested their time and effort in the project on the ground. From their point of view, access to resources is one of the key factors. In most jalmohal sites, project fishers now have access to water bodies that they were previously excluded from. In non-leased sites (rivers and floodplains) they have been able to establish more effective control over the fishery. In rivers, CBOs have been able to turn an open-access free-for-all into a situation where access is controlled by the CBO – they can reduce illegal fishing and do the right things to improve the fishery. In floodplains, a seasonal free-for-all has been effectively converted to CBO controlled, private property.

While community group members usually say that their fish catches have improved as a result of the project they also often mention the return of rare fish species to their water bodies. But the priorities of project participants are unpredictable. When asked: “What is the number 1 thing that you have gained from the project?” a representative of a CBO in Narail responded: “Participatory planning.”

This might be surprising, but this is part and parcel of what the project was actually about. The project has resulted in the empowered CBO members who can stand up for themselves. They know where to look for help when they need it. They can plan their activities. They have social standing.

They are also the strongest advocates for expansion of community management and could play a valuable role in this process in the future. For example, an Association of Fisheries CBOs is now being registered who could provide support services such as training to new CBOs.

## WHEN DOES COMMUNITY MANAGEMENT WORK BEST?

Dr Elinor Ostrom (1990) considered the following conditions as crucial for successful community management of shared resources:

1. There is a clear definition of who has the right to use the resource and who does not, and clearly defined boundaries of the resource.
2. Users feel that their obligations for managing and maintaining the resource are fair in light of the benefits received.
3. Rules governing when and how the resource is used are adapted to local conditions.
4. Most individuals affected by the rules can participate in setting or changing them.
5. Use of the resource and compliance with rules is actively monitored by the users themselves or by parties accountable to the users.
6. People violating the rules are disciplined by the users or by parties accountable to them, with penalties imposed in accordance with the seriousness and context of the offense.
7. Local institutions are available to resolve conflicts quickly and at low cost.

8. Government authorities recognize users' rights to devise their own management institutions and plans.

As a counterpoint to the advantages of co-management for fisheries, Robert Pomeroy (Pomeroy and Ahmed, 2006) adds that co-management has several disadvantages and problems, including:

- It may not be suitable for every fishing community. Many communities may not be willing or able to take on the responsibility of co-management.
- Leadership and appropriate local institutions, such as fisher organizations, may not exist within the community to initiate or sustain co-management efforts.
- In the short-run, there are high initial investments in time, financial resources and human resources to establish co-management.
- For many individuals and communities, the incentive(s) – economic, social, and/or political – to engage in co-management may not be present.
- The risks involved in changing fisheries management strategies may be too high for some communities and fishers.
- The costs for individuals to participate in co-management strategies (time, money) may outweigh the expected benefits.
- Sufficient political will may not exist to support co-management.
- Unease of political leaders and government officials to share power.
- The community may not have the capacity to be an effective and equitable governing institution.
- Actions by user groups outside the immediate community may undermine or destroy the management activities undertaken by the community.
- Particular local resource characteristics, such as fish migratory patterns, may make it difficult or impossible for the community to manage the resource.
- The need to develop a consensus from a wide range of interests may lengthen the decision-making process and result in weaker, compromised measures.
- There may be shifts in “power bases” (political, economic, social) that are not in the best interests of all partners.
- There are those who feel that co-management is too costly and time-consuming and that other alternatives, with stricter regulations, may be better.
- There is always a possibility of unbalanced and inequitable sharing of power between the government and communities and the use of co-management by some political leaders solely for their own purposes.



## PROJECT EXPERIENCES

There may be some lessons to be learnt from situations in the CBFM-2 project where community management has not worked.

Some examples from project implementation are as follows:

Betaldoba is a fairly productive closed beel that was initially included in CBFM-2. There were disagreements within the CBO over money – where some of the CBO members paid money for activities which were never carried out and a virtual take-over of the CBO by a few individuals. By the time the partner NGO and DoF reacted, the disagreements were too great and the water body was dropped.

Naliakarma's problems stemmed from poor initial beneficiary selection where a number of 'influential' were included in the CBO. There was also a problem with bauth<sup>1</sup> fishing in this beel and poor leadership. Again the water body was dropped from the project.

In Hatinamaral beel, the partner NGO Proshika was forced through local political pressure to sub-contract a local NGO. The CBO members felt exploited under this arrangement as the local NGO tended to act in its own interest rather than supporting the development of the CBO.

Shapla and Huruil beels were also caught up in the problems caused by political pressure on Proshika. The local DoF staff and Proshika staff could not work together. There was also conflict within the CBO and a take-over of the CBO by a few individuals.

Looking at some of the case study notes for these water bodies and for the many court cases that have been raised under the project, power struggles and money seem to be main sources of problems. The question is whether this is just the way things happen now in rural Bangladesh or whether the uncertainties caused by the project have resulted in more conflict. Introducing a new system of tenure will always be contentious but the old leasing system for jalmohals also results in lots of problems. Hopefully as community management becomes 'normal practice' the incidence of conflict will reduce.

These cases also highlight the need for detailed local knowledge, not just of the physical water bodies but also the communities around them before embarking on community management. It requires people skills and experience to do this and these have been developed through the CBFM and similar projects not just in the implementing organisations but also in the CBOs themselves. This will be a valuable resource for any future expansion of CBFM.

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<sup>1</sup> Fishing festival

## CONCLUSIONS

In summary, the progress achieved by the project during implementation has been remarkable. Five years ago community based approaches were seen as an experimental system that needed to be tested – this has now been done and community based management is now part of mainstream policy-level thinking.

While the immediate project objectives have been achieved, much more work will be required before community managed fisheries make a meaningful contribution at the national level. It takes time to build trust and for community groups to establish effective managerial control. There are around 12,000 government owned water bodies in Bangladesh and up to 4 million hectares of floodplain so there is plenty of scope for expansion.

As a starting point, the project leaves 130 CBOs most of whom have shown they can manage the resources under their control – this would be an ideal test bed for further fisheries research – all the hard work has been done, so future researchers only need to collaborate with the CBOs, inform them and help them develop. There are lots of questions to be answered – just on fisheries information is required on ideal sanctuary sizes, the timing of and the length of closed seasons, and the level of exploitation that suits different water bodies.

## ACKNOWLEDGEMENTS

On a personal note I would like to say how much my short involvement with CBFM has enriched my life and given me hope that it is possible to ‘make a difference’ and do something about reversing declining capture fisheries – there is an alternative to aquaculture which really works.

I would like to thank the many people who have been involved in this project in WorldFish, and my many friends in DoF and the NGOs. The other big thank you is to the community members who have invested time and effort in CBFM in the expectation of, rather than the certainty of, rewards that they can pass on to future generations.

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## ANNEX 1 – CBFM-2 Publications

### CBFM2 Project – Publications List

#### Policy Briefs\*

1. Capturing the Benefits (Power relations)
2. Fisheries Yields and Sustainability
3. Livelihoods Impact
4. The Right Option

#### Booklets\*

1. Turning the Tide (General background to CBFM)
2. Fishing for a Future – Women in CBFM
3. Institutional Options for Empowering Fisher Communities
4. The Legal Background to CBFM in Bangladesh
5. Micro-credit and the CBFM-2 Project
6. Social Capital and the CBFM-2 Project

#### Working Papers\*

1. Case Studies of Six CBFM-2 Water bodies
2. Livelihood Impacts of the CBFM-2 Project

#### Consultancy reports\*

1. Building Effective Partnerships for CBFM
2. Assessing Macro-Economic Impacts of CBFM
3. Fisheries Impacts of the CBFM-2 Project
4. Report on Poverty Impact Monitoring
5. A Study on Perceptions of CBFM Stakeholders
6. Strategy for the Management of Microfinance Activities and Funds in CBFM-2 and CBFM-SSEA Projects

\*All the above documents are available on the CBFM-2 web-site: [www.cbfm-bd.org](http://www.cbfm-bd.org)

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Conference Paper 02



## Institutional Issues in the CBFM-2 Project

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## ABSTRACT

A wide range of institutional arrangements were practiced in the Community Based Fisheries Management project in phase-1 (1994-1999) and phase-2 (2001-2007). The project documents stated that there were three main fisheries management approaches; fisher-led, community-led and women-led, however this fails to capture the full diversity of approaches adopted by 10 project partners (including DoF) during implementation. As a part of the institutionalization process, 130 CBOs were developed and established under the project as clear legal entities. In order to achieve sustainable management of the fisheries, efforts have been made towards linking these community-based organizations (CBOs) and local institutions in CBFM-2 sites. Four regional CBO networking committees and a central committee were formed. The central committee is now being officially registered. Project partner NGOs were the main agencies involved in the CBO development process. To improve the likelihood of long-term CBO sustainability, plans have been prepared and are being implemented for project phase-out and post-project sustainability. Another important process was cluster management in CBFM. Overall, it can be concluded that the establishment of CBOs as local level institutions, cluster management and CBO networks made a positive contribution towards project implementation and should help to ensure that CBFM approaches are sustained.

## BACKGROUND AND INTRODUCTION

The definition of an institution is an organization or social unit having a complete stratified structure of positions that is systematically coordinated. It is goal-directed and task-oriented as enunciated by its doctrine. It is characterized by a hierarchy of positions and roles, the performance of which is socially regulated according to the goals and tasks undertaken. In one sentence, it can be said that "it is a body of persons organized for a specific purpose".

In common with many other developing countries, the appropriation of natural resources and in particular, fisheries resources has been carried out by a few people to ensure their livelihoods and consolidate their wealth. With increasing populations, there is even more pressure on these resources. In Bangladesh, there are over 12,000 public water bodies, which have primarily been used by the richer people of the community through highest bidder leasing arrangements thereby excluding the poorer sections of the community.

The concept of community-based fishery management developed in the early 1990s and has been applied for the last 13 years in Bangladesh with the aim of including poor fishers in the resource management system by giving them access rights on these water bodies. Several donor funded projects have been working with this system including the Fourth Fisheries Project, MACH and CBFM.

The Community Based Fisheries Management Project, Phase-2 (CBFM-2) started implementation in September 2001 for the 'sustainable improvement of the livelihoods of poor people dependent on aquatic resources'. In order to achieve this goal, the project partners have focused on the formation of community groups and organizations, starting from the village and water body level through to the upazila, district, regional and central levels. Several types of institutions have been developed at all levels in order to facilitate the activities. Therefore, the concept of institutionalization is a vital issue in the project to deal it appropriately, so that it sustains for longer times to harness benefits to the poor people, particularly poor fishers in managing the common properties judiciously in the natural resources sector. If these institutions can't play their roles properly then sustainability will be a bigger issue for the poor fishers in ensuring their livelihoods.

## PARTNERSHIPS IN CBFM

The direct project partners were 11 NGOs, the DoF, the WorldFish Center and the CBOs. The WorldFish Center's role was coordination, research, dissemination of information and reporting to the donor organisation, DFID. The Department of Fisheries were responsible for coordination, formulation of water body policy, research and uptake. The 9 implementing NGOs were more involved in the CBO development process, testing CBFM approaches through organising the communities, development of the CBOs, linking the CBOs through committees and ensuring their sustainability. Apart from these, two specialised partner NGOs were involved in providing legal advice and media support for the project.

The main lessons that were learnt on partnerships were:

- The NGO partners needed to recruit and retain high quality staff with adequate programming experience from the inception of the project.
- There should have been more interaction between partner organizations through cross visits and attending each others meetings and workshops.
- It is important to identify weak areas of each partner organization from inception and then try to improve those gradually.
- NGO partners should be selected with clear capacities in livelihoods and community group formation
- It remains unclear whether the various strategies employed by the partner NGOs produce equally equitable benefits; the exclusion of the very poor may be more likely under fisher-led approaches than under community led initiatives.
- Some NGOs are involved in a range of different projects and approaches to CBFM and become over stretched and/or have less interest in continuing activities without funding.
- The donor requirement was to focus primarily on vulnerable groups - this needed to be clearly communicated to the NGOs as a core aim.
- Substantial progress was made in networking the CBOs of various projects engaged in CBFM. A series of workshops have been held at

which CBOs exchanged experiences and debated future strategies for coordination. The CBOs established their successes, failures and constraints to date and discussed opportunities to improve their effectiveness.

- Some cluster committees are functioning, but no higher apex body has yet been formally convened, although CBOs have met to discuss apex establishment in one place.
- PNGOs should document the added value of cluster committees and apex bodies for future reference.

## IDENTIFICATION OF COMMUNITY GROUPS

The identification of CBFM community groups was a complex task due to the nature and diverse characteristics of the water bodies, floodplains and the communities. The community groups were identified by the partner NGOs based on their own selection criteria. In the Memorandum of Agreement (MoA) which was agreed for each partner NGO, the WorldFish Center and the DoF, the beneficiary selection criteria was to ensure that a major share of the benefits from project activities reach the poorest members of the community. Direct beneficiaries (eligible for training and credit from the respective partner NGO) were members of groups and community based organizations organized or facilitated by the respective NGOs. The general selection criteria were as follows:

- Persons who catch fish by themselves for their livelihoods;
- Persons who have less than 50 decimals of land including the homestead in floodplain sites, and persons who have up to 100 decimals of land property excluding the homestead in haor areas;
- Persons who have an annual income of less than Tk. 30,000, primarily from manual work; and
- Persons who sell their labour for at least 100 days per year for their livelihoods.

In the case of indirect beneficiaries and wider participants in management bodies, community organizations and decisions were to be residents of the villages using the project water bodies/wetlands but may be from all social classes.

Considering the above as guidelines, the partner NGOs used fishing and land as the two common criteria for direct beneficiary selection. At least four other criteria were also used, including: income, the sale of labour, involvement with other NGOs and/or employment with government, and sex. Banchte Shekha, was the only NGO targeting women as primary group members, but the other NGOs were working with both males and females. It is worth noting that some of the CBFM project groups were modified from the previous NGO groups.

After the inception of CBFM-2 project, a single round HH census was done in all water bodies. The main objective of this census was to identify target stakeholders from all HHs living around each water body, and to provide



population data for making more detailed sample surveys. The HH census started in September 2001 and ended in March 2002, except in the new NGO areas, which were carried out in 2003-2004.

From the census, five sub-categories of HHs were identified:

- Category I: Poor fisher household who fishes for income or both for income and food, usually does labouring work, and possesses no agricultural land;
- Category II: Poor fisher household who does not fish for income, has no agricultural land, usually does labouring work, but not service or professional jobs;
- Category III: Moderately poor fisher household, who fishes for income, has some agricultural land (< 100 decimals), or if occupation includes service or professional job and has a thatched house;
- Category IV: Moderate poor household, who does not fish for income, has some agricultural land (< 100 decimals), or if occupation includes service or professional job and has a thatched house;
- Category V: Better off households, who may or may not fish for income, have land more than 100 decimals and/or have someone with a service or professional job and a tin roofed/constructed house.

These classifications were used because any estimates of annual income would be unreliable in a census. The two poor categories approximated to the bottom poor category referred to in poverty studies, but distinguished those fishing for an income from others in the same category. The moderately poor category was widened slightly to include up to 100 decimals of land, and “tomorrow’s poor” were not distinguished. The landholding categories used in the census coincided with those used in national statistics, with the next category being 100-250 decimals.

## FORMATION OF COMMUNITY GROUPS

At completion the project covered a total of 116 water bodies including 38 rivers/river sections sites, 14 closed beel sites, 28 open beel sites, 28 floodplain beel sites and 8 small beel sites implementing CBFM approaches in 22 districts and 47 upazilas. The project followed three main approaches to CBFM:

- Fisher managed fisheries - form groups among the fishers using each water body and then a committee to represent each group and take management decisions.
- Community managed fisheries – the group formation process involved both fishers and other community members followed by the formation of water body management committees according to the suggestions of all stakeholders.
- Women managed fisheries – women group members take a lead in resource management following participatory planning involving the whole community. The groups may be mixed with men and women.

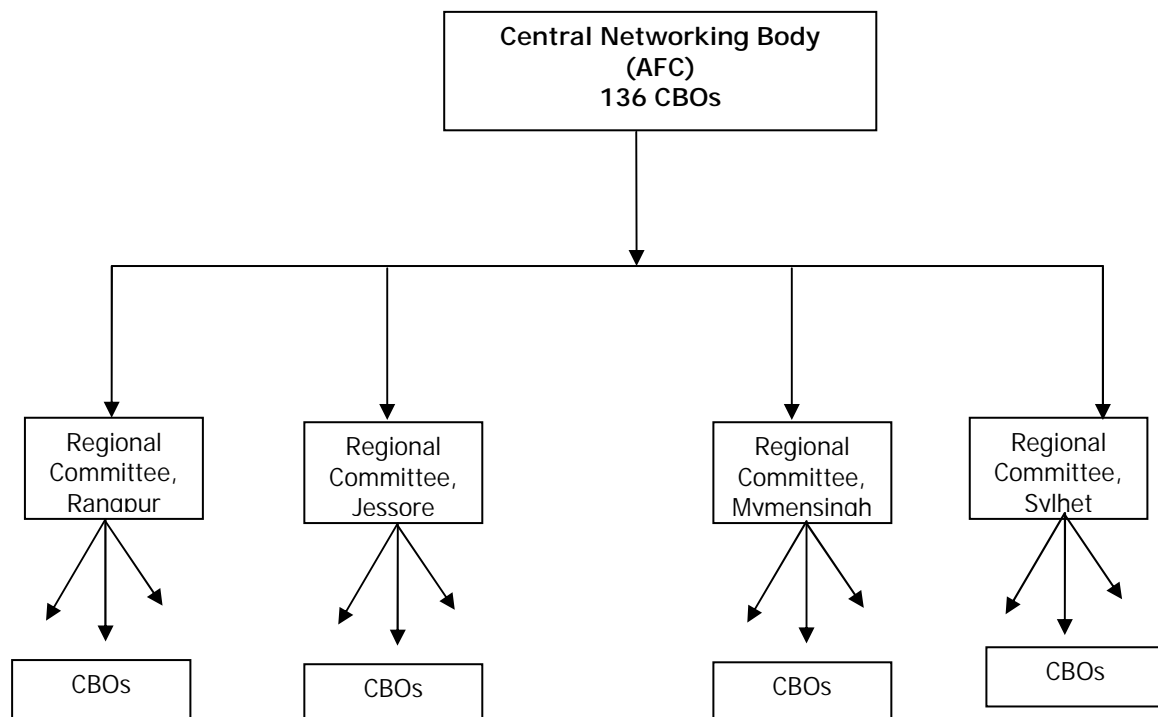
## WATER BODY MANAGEMENT COMMITTEES

Following these approaches, primary groups were formed followed by the establishment of water body management committees. The total number of CBOs at the end of the project was 130 in 116 WBs. Each CBO accomplished the following major tasks:

- Opened bank accounts
- Developed a water body management plan
- Arranged funds for implementing their plans through a combination of local fund raising and grants/revolving loan funds from the project
- Established community centres (at most sites) for use as meeting and training places for the community
- Ensured close coordination between the project participants, partner NGO staff and DoF staff
- Ensured that all fishery management measures are followed

Efforts were made to link community-based organizations (CBOs) and local institutions in CBFM-2 sites. Four regional CBO networking committees and a central committee were formed on an ad-hoc basis.

Fig. 1. A framework for the CBO networking body



Source: CNRS - Concept Note on Strengthening and Capacity Development Support to the CBO Networking System in CBFM

The Central Networking body for CBOs met as an ad-hoc committee in the latter stages of the project and is in the process of being registered as an official body – the Association of Fisheries CBOs (AFC). It a networking body

to represent the interests of 136 CBOs formed under the CBFM-2 and CBFM-SSEA projects.

The major tasks of the AFC are as follows:

- Create a united force representing the interests of the CBOs,
- Deal with the central policy level issues on behalf of the CBOs,
- Ensure support of the DoF (already committed through MoAs) at different levels,
- Monitor and ensure legal support and demarcation,
- Ensure smooth handover of micro-credit funds to the CBOs,
- Provide support and information to allow the replication of CBFM approaches in non-project water bodies,
- Keep contact with relevant stakeholders through coordination and communication,
- Resolve water body level conflicts, and
- Ensure payment of water body lease money in subsequent years.

## CLUSTER MANAGEMENT IN CBFM

The broad objective of cluster management is to facilitate ecological management of open-water fisheries resources, with a view to enhancing the livelihoods of poor fishers. The concept is to co-ordinate the management of linked water bodies as fish are mobile resources that need a wide range of habitats at different stages of their life cycle.

In the CBFM-2 project, cluster management concept was followed by CBOs organized by the NGOs, CNRS, Proshika, Caritas, Gharoni, Banchte Shekha and CRED. This was achieved by the formation of cluster management committees dealing with particular watersheds.

The benefits from the cluster management in CBFM were:

- It helps in the identification of the management boundary of a project water-body.
- It can contribute to preventing the use of harmful gears that are being used in the project water-bodies.
- It can contribute in implementing such actions that need the joint initiative of more than one CBO.
- It can play role in habitat restoration and opening of fish migration routes.
- Actions to control fishing effort (closed season, fish sanctuary, reduction of harmful gear use, etc) require intervention in a coordinated manner.
- Cluster committees can play a role in conflict management amongst CBO members and between CBOs.
- Cluster Committees can play a role in developing linkages between the CBOs and different government and development service providers.

However a number of constraints to cluster management were also noted including communication problems between CBOs spread over a larger area, the lack of a clear incentive for committee members to attend meetings and the shortage of scientific information for decision making by the cluster committees.

## EMPOWERMENT OF COMMUNITY GROUPS IN CBFM

The community groups in CBFM-2 project areas have been empowered through a series of official agreements so that they have clear access rights to public and privately owned water bodies. For publicly owned water bodies such as closed and open beels, the Ministry of Land agreed to pass over responsibility to the Ministry of Fisheries and Livestock so that the CBOs could utilise the water bodies initially for 10 years with a further extension of 10 years subject to a performance review. In private water bodies, such as floodplains, CBOs access rights and legal rights were established through registration either with the Cooperatives Department or with the Social Welfare Department. The only exception was with Charpara Samity in Daudkandi, Comilla where registration was as a Joint Stock Company.

A Memorandum of Agreement was also made between the local District Fisheries Office and the respective CBOs for the use of the 60 publicly owned water bodies in the project. There was also local handover of the publicly owned water bodies from the Deputy Commissioner (DC) to the Department of Fisheries (DoF) and to the project CBOs for most of these WBs.

In order to further strengthen the position of CBOs, other official agreements have been drawn up for publicly owned water bodies between DCs and District Fisheries Officers which involves a 150 Taka non-judicial stamp and a handover agreement will be made between the respective partner NGOs and CBOs with the support of the Senior Upazila Fisheries Officer/Upazila Fisheries Office.

## TRAINING SUPPORT IN CBFM

Training of CBO members played a key role in the process of CBO development. Most CBOs received training on leadership development, good governance in CBOs, accounts management, participatory planning, gender and empowerment, micro-credit management and alternative income generating activities (AIGAs). At the end of the project, 1000 courses have been delivered by partner NGOs to the 130 CBOs at a cost of 11 Million Taka. This represents a cost of around US \$ 7 per project primary beneficiary.

## AREA TEAM CONCEPT IN CBFM

The Area Team concept was introduced in August 2006 during the extension phase of the project with a special mandate to assess progress and solve the critical issues affecting sustainability of the CBOs. The teams brought together the WorldFish Center, PNGO and DoF field-based staff in each area,

greatly facilitating communication and lesson sharing between organizations. Before this there was relatively little contact between staff from different NGOs and the WorldFish Center staff had mainly been involved in data collection for research projects.

Each Area Team finalized a strategic training action plan to promote institutional sustainability for each of the CBFM-2 CBOs. At the end of each month the teams met to evaluate progress, and to prepare a 'To Do List' for the forthcoming month. A total of six teams worked over the last six months of the project.

## CBO SUSTAINABILITY IN CBFM

In order to assess the progress of CBO development under the project and to maximize the likelihood of their future sustainability, a monitoring system was developed by the WorldFish Center and introduced in November 2005. A total of three rounds of assessment have so far been carried out in December 2005, July 2006 and November 2006.

The main assessment tool is a data collection questionnaire, which is filled in through focus group discussions (FGDs) with CBO leaders and other CBO members by a group of staff from WorldFish, DoF and the partner NGOs. The aim of the process is to identify the present status of the CBO, and contribute towards the preparation of strategic and practical action plans to promote the sustainability of the CBO.

Each of the observing points has a series of options which are later scored from 0-5. The numeric data are analyzed in spreadsheets to find the overall score (in percent) which represents the sustainability level of the CBO. The sustainability levels are classified as follows:

Probability of sustainability	Required score (%)
Very high (VHP)	75 or more
High to medium (HMP)	65-74
Low (LP)	55-64
Unlikely (Unl)	54 or less

As shown in figure 2, there has been a general improvement in the sustainability level of CBOs. More CBOs are shifting towards 'Very High Probability (VHP)' and 'High to Medium (HMP)'. At the 3rd round assessment, 39 and 44 CBOs (out of 128) have reached to VHP and HMP, respectively. This was possible by introducing 'Area Teams' in August 2006. The Area Teams included staff from WorldFish, DoF and respective partner NGOs. The prime objective of Area Team formation was to reinforce the efforts of the NGO however, the charter of an Area Team is to coordinate and synchronize the individual efforts of the partner organizations including the CBO.

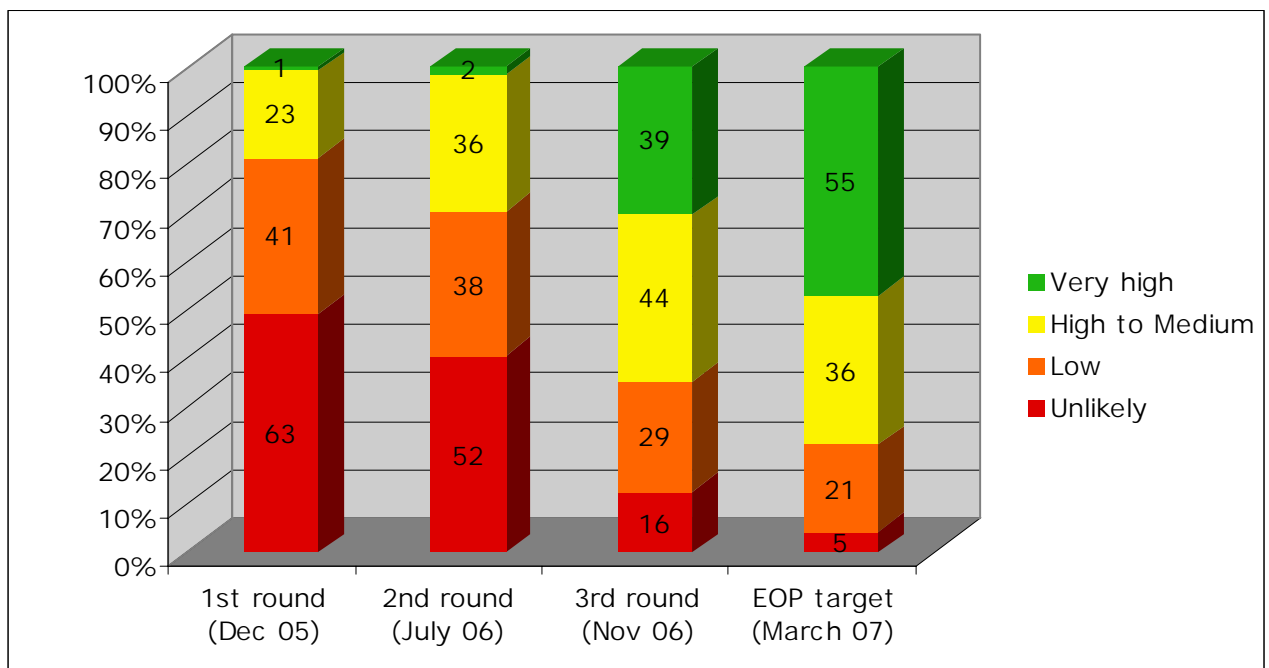
Most of the better performing CBOs are managing either open beels or floodplains. For instance, 10 open beel CBOs and 18 floodplain CBOs reached VHP (72% of the total number in VHP), in the 3rd round assessment.

These are water bodies with seasonal fisheries. Perhaps the year round co-operation between farming communities means that it is easier to establish functioning CBOs. The additional income from fishing, the educational status of household heads and the social capital of the beneficiaries may contribute to generate better coherence, and hence to mobilize the CBO effectively.

In contrast, rivers are fished almost year-round, but the CBOs performed much worse than those in open beels and floodplains. It difficult to draw clear conclusions but there are indications that ‘benefit’ is not the only issue affecting the institutional sustainability of a CBO, especially for the most disadvantaged groups of people. In addition, the mobilization of a huge number of beneficiaries and the efficiency level of CBO leaders might be other reasons for their relatively poor performance.

Closed beels are usually managed as stocked fisheries with management regimes very similar to large aquaculture businesses. About half of them (5 out of 11) have reached VHP. In small beels, the ‘benefit’ in terms of fish supply is not impressive, but all but 2 of them were able to reach HMP. The partner NGO for small beel CBOs, (CNRS) helped them to diversify their activities with the assistance of several local government agencies thereby enhancing their institutional sustainability.

Fig. 2. The results of CBO assessments (% age of total CBOs)



## LESSONS LEARNED ON CBO SUSTAINABILITY

The following lessons have been drawn from the CBO sustainability assessment:

- Court cases (currently 32) and conflicts are negative factors that tend to minimize the probability of sustainability
- The multiple leasing system of the government triggers conflicts.
- The best way to avoid conflicts is to establish and maintain better linkages with the local administration and elites.
- Inadequate leadership is another vital factor. Better leadership development largely relies on better community mobilization. Pro-active initiatives by the field staff add value.
- Distribution of benefits supplements better community mobilization/coherence, and hence leadership development.
- Election helps the leaders to be accountable and hence to develop good leadership.
- Fisheries management largely depends on good leadership.
- Effective coordination 'is a must' to synchronize the efforts of partners to attain the common goals and objectives. Coordination can make better progress if the coordination-initiatives are decentralized.
- Following institutionalization, the practical empowerment of the CBOs may require a considerable amount of time (i.e. another couple of years).
- It is critical to understand the biological, physical and technical aspects of the resources, but it is equally important to comprehend the various market attributes and external social, political and institutional forces that influence the behaviour of the various stakeholders and managers.
- Other user groups are very active in floodplain and open beel therefore an integrated resource management (i.e. fisheries, agriculture, etc.) approach should be adopted.

## CONCLUSIONS

Institutional sustainability has always been one of the main concerns during implementation of the CBFM projects. There are many examples of projects where the key institutions have not been sustained beyond the project lifetime. In the case of the CBFM-2 project, attaining a clear legal status for the CBOs, cluster management, CBO training and the formation of a management body, the Association of Fisheries CBOs, have all played a part in creating institutions that have a good chance of being sustained. Whether they will be sustained over the longer term will depend very much on what happens in the wider sector. Community based approaches to fisheries management have now been included in official government strategy documents and it appears likely that there will be a widespread expansion of this approach in both publicly-owned and privately owned water bodies. If this happens, the community groups formed under the CBFM projects will almost certainly be sustained under this wider umbrella, indeed they, as the pioneers of this approach, will form a key resource to be used during the replication process. On the other hand, if community managed fisheries approaches do

not expand, the future for CBOs formed during the CBFM projects will be much harder.

## ACKNOWLEDGEMENT

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Conference Paper 03

# Impact of the Community-Based Fisheries Management on sustainable use of inland fisheries in Bangladesh

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## ABSTRACT

The Community Based Fisheries Management (CBFM) project in Bangladesh aimed to promote the sustainable use of inland capture fisheries by empowering fisher's communities to manage their own aquatic resources. This paper describes the impact of fisheries management performance using data generated under the CBFM project, funded by the Ford Foundation and the UK Government's Department for International Development (DFID).

Using quantitative indicators of catch per unit area (CPUA), catch per unit effort (CPUE), catch per fisher's day (CPD), biodiversity index ( $H'$ ), fishing intensity (DPUA) and destructive fishing ratio (DFER) at up to 86 project water bodies across the country representing a variety of different habitats was compared with that of existing fisheries management (control water bodies). Estimates of the slope coefficients for each performance indicator were compared among habitat type and between CBFM and control water bodies using ANOVA (GLM). Fish production was found to have increased significantly through time at CBFM water bodies.

Trends in fish production through time were upwards at 77% of the 64 project water bodies that were monitored for at least three years without data gap. Trends in fish abundance, indicated by annual average daily catch rates by fishers, were also upwards at 72% of monitored water bodies. Changes in biodiversity index ( $H'$ ) with time were found to be positive and significantly greater than in control water bodies. Species assemblages are richer and more abundant at CBFM compared to control water bodies. Trends in biodiversity were also upwards at 70% of monitored water bodies. Considering all management approaches together, the score based performance indicators suggests that a fisher managed approach ensured maximum benefits, and followed by community managed and women managed approaches.

In conclusion, community-based fisheries management appears to perform significantly better than the existing management system in Bangladesh. Future projects might choose to place greater emphasis on identifying habitat-specific interventions and arrangement to meet precise management objectives. Existing information sharing networks could support experimentation and learning under future initiatives.

Key words: Community-Based Fisheries Management, Sustainable, Biodiversity,

## INTRODUCTION

Bangladesh is endowed with enormous inland fishery resources and vast inland waters that are vital to millions of poor people, but production and species diversity are believed to be declining. Fishers and experts have identified potential causes for this decline including habitat degradation due to siltation and conversion to agriculture, increasing fishing pressure, destructive fishing practices and an acute shortage of dry season wetland habitat (Hughes et al. 1994).

The first phase of the Community Based Fisheries Management (CBFM) during 1994-1999 was funded by Ford Foundation grants. After an interim period of nearly two years with little or no community-based management activity, a second phase of the project (CBFM-2) began in September 2001. This ongoing 5-year follow-on phase, funded by the UK Government's Department for International Development (DFID), is being implemented jointly by the WorldFish Center and the Government of Bangladesh's Department of Fisheries, through a partnership involving 11 Non-Governmental Organizations (NGOs).

These field-based partner NGOs are responsible for organizing about 23,000 poor fishing households around 116 water bodies representing a range of different habitat types (14 closed beels, 28 floodplains, 8 haor beels, 28 open beels and 38 river sections) and located in regions throughout Bangladesh (Figure 1).

The study employed data collected from CBFM and control sites since 1997, representing a range of different habitat type and geographic location. Performance indicators relating to production, resource sustainability and biodiversity were identified together with more than 15 explanatory variables hypothesised to affect management performance.

Impacts of the CBFM were examined in two ways. Firstly, by testing for significant differences in estimates of mean values of performance indicators between CBFM and control sites (controlled comparisons) using general linear models (GLMs). Secondly by testing for significant upward or downward trends in estimates of performance indicators at CBFM sites through time (time series analysis).

For the time series analysis, significant trends in performance indicators through time were explored by testing the significance of the "slope" coefficient of regression models of performance indicators fitted using the GLM routine where time (year) was treated as the independent variable. Only sites with at least four years of observations were examined.

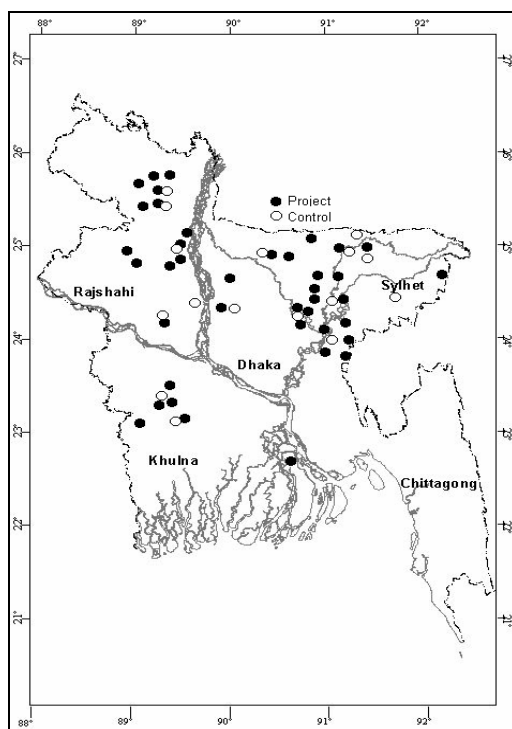


Fig. 1: Location of monitored CBFM and control sites in Bangladesh

## MATERIALS AND METHODS

Monitoring of management performance variables at CBFM sites was conducted both routinely and on an ad hoc basis at both CBFM and control sites. Control sites were selected with similar topographic features and existing fishing activities to those chosen for CBFM project support. The assessment employed species-wise catch and gear-wise effort data sampled under the Project's catch assessment survey (CAS) between 1997 and 2005 from a maximum of 107 divided unequally between those under CBFM and unmanaged control sites (Table 1).

Fishing activity was observed for four to eight days per month, per site. During the first day of each two-day sampling period, a census (complete count) of gears by gear type in operation is undertaken. On the second day, randomly selected samples of landings (catch) by species and effort (gear hours) by gear are recorded for each gear type observed to be operational on the previous day. The number of samples (n) recorded for each gear type on this second day of sampling varies was typically approximately  $n = 7$  for gillnets – the most popular gear type.

Table 1. Number of monitored CBFM and control sites by habitat type and year. CB- Closed beel; FPB-Floodplain beel; HB- haor beel; OB-Open beel; R – River section.

Split year	CBFM					Control					Total
	CB	FPB	HB	OB	R	CB	FPB	HB	OB	R	
1997-1998	2	2		2	10						16
1998-1999	5	2		2	10						19
1999-2000	4	2		2	9						17
2000-2001	2	2		2	8						14
2001-2002	2	2		2	7						13
2002-2003	9	23	6	20	16	1	4	4	4	6	93
2003-2004	12	24	6	27	19	1	4	4	4	6	107
2004-2005	12	23	6	22	20	2	4	4	4	6	103
2005-2006	11	22	7	27	19	2	4	4	4	6	106

### Performance Indicators and Explanatory Variables

Management performance was quantified using indicators of production and resource sustainability. Where appropriate, differences in scale among sites were accounted for by standardizing the indicator by the mean maximum (flooded) area of the site (MaxAreas) observed during the project duration.

Annual multispecies catch per unit area (CPUA) was employed as a measure of production at each site:

$$CPUA_{s,y} = \frac{\sum_{m=June}^{m=May} \sum_{g=1}^n Catch_{s,y,m,g}}{MaxArea_s} \quad \text{Equation 1}$$

Where  $Catch_{s,y,m,g}$  is the estimated multispecies catch landed by gear type  $g$ , during month  $m$  and year  $y$  at site  $s$  measured in  $kg\ ha^{-1}\ y^{-1}$ .

Fish abundance indicated by multispecies catch per fisher per day or 'catch per day' (CPD) expressed as  $kg\ day^{-1}$  was employed as a measure of resource sustainability:

$$CPD_{s,y} = \frac{Catch_{s,y}}{Annual\ Fishing\ Days_{s,y}} \quad \text{Equation 2}$$

Where  $Annual\ Fishing\ Days_{s,y}$  is the estimated total number of days spent fishing by the fishers at site  $s$  during year  $y$ , irrespective of the gear type employed.

Because of the fundamental importance of sustaining or improving fish abundance as a management objective, an alternative indicator of fish abundance that accounts for any changes in fishing power was also employed based upon observations of gillnet catch per unit effort (GNCPUE) estimates made between August and September (Equation 3):

$$GNCPUE_{i,s,y} = \frac{Catch_{8-9,i,s,y}}{NetArea_{8-9,i,s,y} \cdot Hours_{8-9,i,s,y}} \cdot 1000 \quad \text{Equation 3}$$

Where  $GNCPUE_{i,s,y}$  is the catch rate of the  $i$ th gillnet sampled at site  $s$  between August (month 8) and September (month 9) of year  $y$ . The ratio was multiplied by 1000 because units ( $kg\ m^{-2}\ hr^{-1}$ ) were typically very small.

Two measures of fishing effort were employed as additional (indirect) indicators of the sustainability of the fisheries. The first; annual days fished per unit area (DPUA), provided an overall measure of fishing effort (Equation 4).

$$DPUA_{s,y} = \frac{Annual\ Fishing\ Days_{s,y}}{MaxArea_s} \quad \text{Equation 4}$$

The second; destructive fishing effort ratio (DFER), provided an estimate of the total annual fishing effort measured in hours with (predefined) destructive gear type ( $dg = 1$  to  $n$ ) as a proportion of the total annual fishing effort with any type of gear,  $g$  (Equation 5).

$$DFER_{s,y} = \frac{\sum_{dg=1}^n \sum_{m=June}^{May} Fishing\ hours_{s,y,m,dg}}{\sum_{g=1}^n \sum_{m=June}^{May} Fishing\ hours_{s,y,m,g}} \quad \text{Equation 5}$$

The predefined destructive gear types included monofilament gillnets, small-mesh seine nets and dewatering (see Annex 1 for a complete list).

Biodiversity, estimated using the Shannon-Weiner biodiversity Index ( $H'$ ) (Shannon, 1948) provided a further indicator of the sustainability of the fisheries from a conservation perspective.

# RESULTS

## Trends in performance indicators

Considering all trends, irrespective of their statistical significance, the presence or absence of the CBFM had a significant effect on the relative frequency of upward and downward trends in CPUA, CPD, GNCPUE and H'. Trends in DFER and DPUA were found to be independent of management. The relative frequencies of the upward and downward trends indicated that the CBFM activities have significantly ( $p < 0.01$ ) benefited production (CPUA), fish abundance (CPD) and biodiversity (H') at the majority (70-80%) of CBFM sites (Figure 2).

Virtually 57% of CBFM sites exhibited downward trends in catch per unit effort during August and September, indicated by effort standardized gillnet catch rates during the period (GNCPUE). However, these frequencies could be expected by chance. Fishing intensity (DPUA) and destructive fishing practices (DFER) both declined at more CBFM sites than they increased at but these frequencies could also be expected by chance (Table 1). At control sites, downward trends in CPUA, CPD and H' were more frequent than upward trends at but the relative frequencies could be expected by chance (Table 2). The number of downward trends in GNCPUE would not, however be expected by chance for all, and only significant, trends, indicating significant declines in the abundance of fish during August and September at control sites.

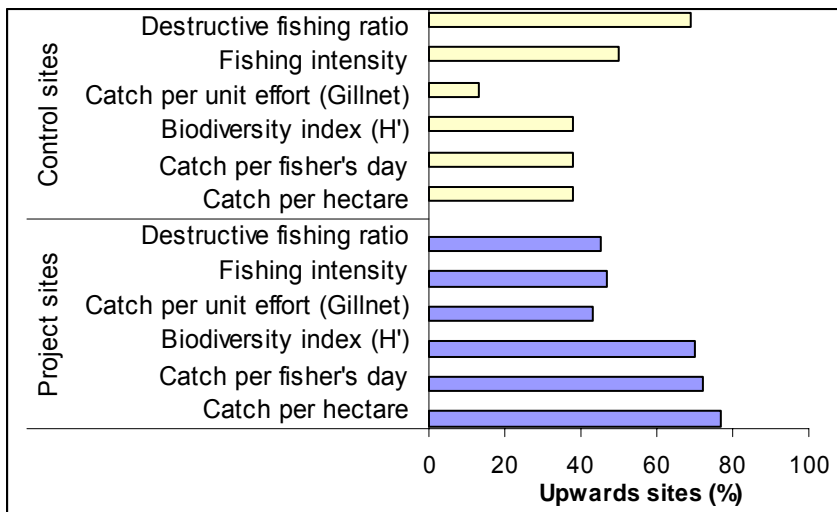


Figure 2: Comparison in the sustainability performance indicators trends for CBFM and control water bodies with at least three years of observation.

Table 2 Frequency (upward and downward) in the performance indicators.

		Performance Indicators					
		CPUA Trend	CPD Trend	GNCPU Trend	DFER Trend	DPUA Trend	H' Trend
		CBFM Sites only					
Frequency Upward		49	46	30	29	30	48
Frequency Downward		15	18	40	35	34	21
		Control Sites only					
Frequency Upward		6	6	2	11	8	6
Frequency Downward		10	10	14	5	8	10

### Site Scores

Mean site score was found to vary significantly among habitat type and between CBFM and control sites. Significant differences in mean site score between CBFM and control sites were detected for closed beel ( $p=0.03$ ,  $1-\beta=0.60$ ,  $d.f.=9$ ), open beel ( $p<0.01$ ,  $1-\beta=0.86$ ,  $d.f.=25$ ) and river habitat ( $p<0.01$ ,  $1-\beta=0.98$ ,  $d.f.=23$ ) (Figure 3).

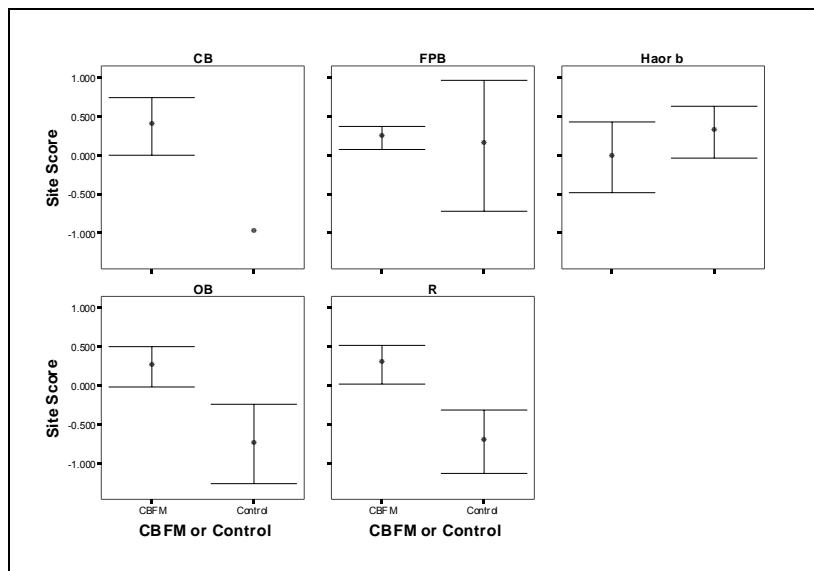


Figure 3. Mean site score with 95% CI for CBFM and control sites by habitat type.

### Mean slope coefficients

Estimates of the mean CPUA slope coefficient ( $cpuab$ ), representing annual rates of change in fish production, were found to vary significantly ( $p<0.05$ )



with habitat type, but not between CBFM and control sites suggesting that the CBFM has had no significant detectable effect on CPUA (Figure 4). However, estimates of the mean slope coefficient for CBFM sites were greater than zero for all habitat except haor beel, and significantly greater than zero ( $p < 0.05$ ) for closed and floodplain beel, and river habitat (Figure 4) indicating increasing production through time in these habitats. Average increases in CPUA ranged from approximately 20 to 30% per year. Estimates of the mean slope coefficient for control sites were not significantly different from zero for all habitats tested indicating no significant change in fish production (CPUA) at control sites (Figure 4).

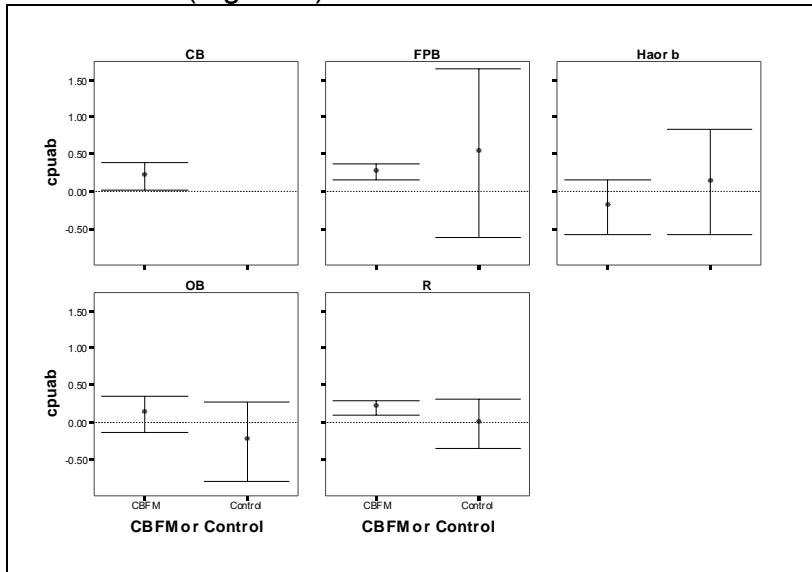


Figure 4 Mean slope coefficient estimates with 95% CI for the fish production indicator CPUA (cpuab) at CBFM and control sites for each habitat. Reference line at zero indicates no change in mean value of indicator.

Variation in fish abundance and fishing intensity, indicated by cpdb and dpuab respectively, best explained the variation in fish production (cpuab) among sites ( $R^2=0.60$ ;  $p < 0.01$  d.f.=77). As expected, fish production increases both with increasing fish abundance and fishing effort although these two variables are typically negatively correlated.

Two-way ANOVA tests (GLM) indicated no significant difference ( $p < 0.05$ ) in the estimate of the mean CPD slope coefficient among habitat type after accounting for differences between CBFM and control sites. After pooling the data across habitat, the estimate of the mean slope coefficient was significantly ( $p=0.03$ ) greater for CBFM compared to control sites, and significantly ( $p < 0.01$ ) greater than zero (Figure 5). The estimate of the mean slope coefficient for CBFM sites translates to an increase in daily catch rates of 16% per annum. Equivalent increases by habitat ranged from 10-20% per annum. Rates of change in fish abundance at control sites were not significantly different from zero.

Estimates of the mean gillnet catch rate (GNCPUE) slope coefficient (cpueb) were found not to vary significantly across habitat type (Figure 5). After pooling the estimates across habitat, the estimate of the mean slope

coefficient for CBFM sites was significantly greater ( $p < 0.05$ ) than for control sites but not significantly different from zero, indicating no significant decline in mean gillnet catch rates at CBFM sites through time (Figure 5). The estimate of the mean slope coefficient for control sites was however significantly less than zero, equivalent to a decline in catch rates (fish abundance) of approximately 30% per annum (Figure 5).

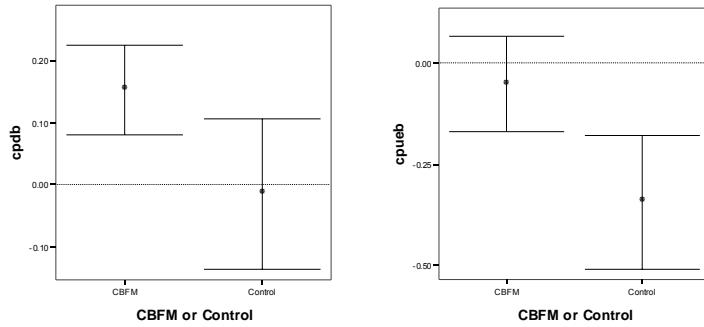


Figure 5 Mean slope coefficient estimates with 95% CI for the fish abundance indicators CPD (left) and GNCPUE (right) at CBFM and control sites for all habitat sites combined. Reference line at zero indicates no change in the value of indicator with time.

Estimates of the mean fishing intensity (DPUA) slope coefficient (dpuab) representing annual rates of change in fishing intensity were found to vary significantly ( $p < 0.05$ ) between habitat but not between CBFM and control sites (Figure 6). For CBFM sites belonging to floodplain beel habitat, mean fishing intensity increased significantly ( $p < 0.05$ ) by approximately 10% per annum, but not significantly more than at control sites. For haor beel habitat, the mean estimate for CBFM sites was significantly less than zero, equivalent to a decline in fishing intensity of more than 30% per year. This decline was not significantly different from that estimated for control sites. The remaining combinations indicated no significant change in fishing intensity through time.

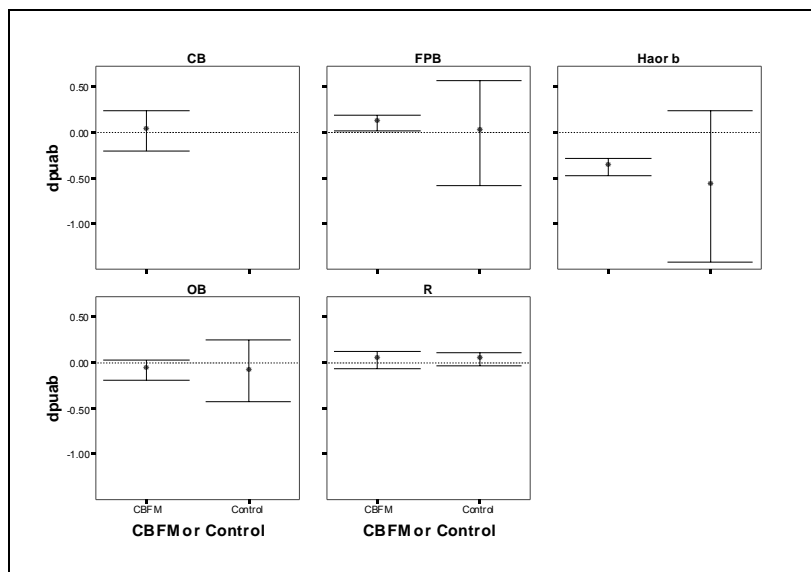


Figure 6 Mean slope coefficient estimates with 95% CI for the fishing effort indicator DPUA (dpuab) at CBFM and control sites for each habitat. Reference line at zero indicates no change in mean value of indicator.

Estimates of the mean biodiversity index (H') slope coefficient (hb) representing annual rates of change in biodiversity were found to vary significantly ( $p < 0.05$ ) with habitat and between CBFM and control sites (Figure 7). On average, hb was 0.19 higher at CBFM compared to control sites. Significant increases in biodiversity at CBFM sites through time (mean slope coefficient  $> 0$ ) were found for both closed and floodplain beel habitat equivalent to annual increases in H' of 0.12 and 0.17, respectively. Frequency distribution of (b) values for trend in biodiversity (H') with time for project water bodies are shown in figure 8. Significant improvements in H' through time were also estimated for control sites in floodplain beel habitat equivalent to 0.21 per annum. No significant ( $p < 0.05$ ) changes in biodiversity were detected at either CBFM or control sites in haor, open beel or river habitat. Estimates for control sites were lower than for CBFM sites for open beel and river habitat but not significantly ( $p > 0.05$ ). A total of 156 species of fish and prawns were recorded from all CBFM2 project water bodies during 2004-2005. Among the most dominant species, 20 species represented nearly 75% of catch (Table 3).

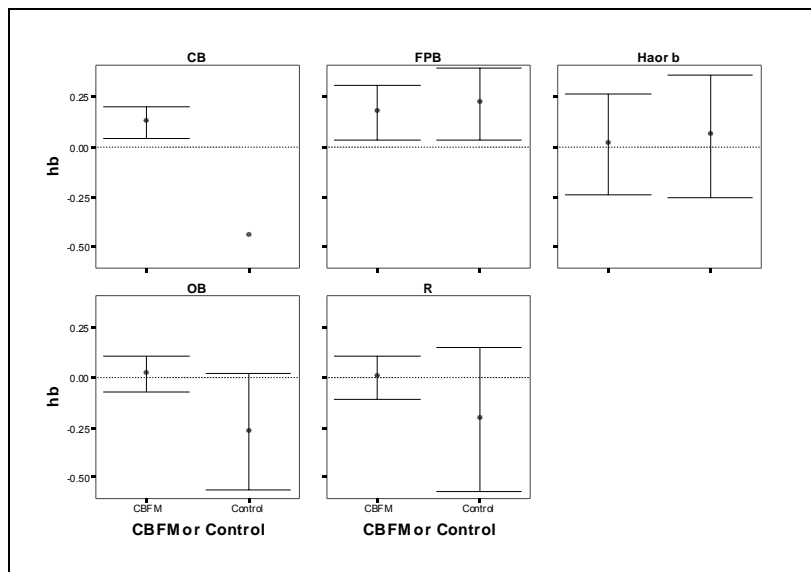


Figure 7 Mean slope coefficient estimates with 95% CI for the fish biodiversity indicator H' (hb) at CBFM and control sites for each habitat. Reference line at zero indicates no change in mean value of indicator.

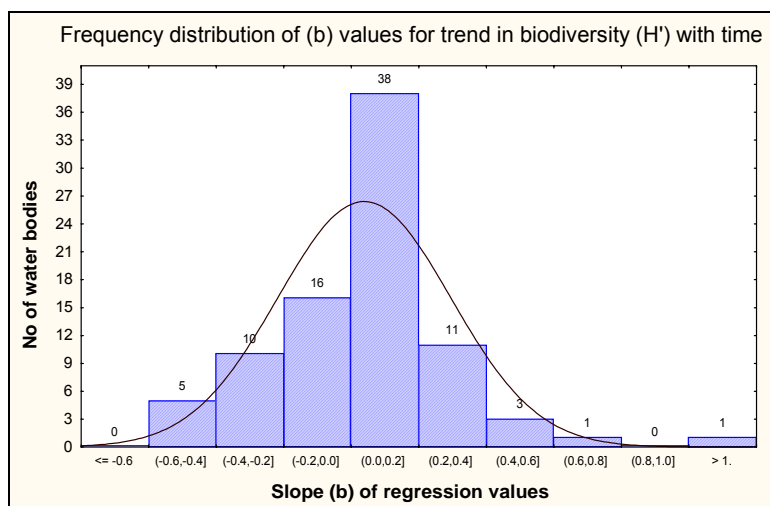


Figure 8. Frequency distribution of (b) values for trend in biodiversity ( $H'$ ) with time for CBFM2 project water bodies.

Table 3. Contributions of twenty dominant fish or prawn species in all CBFM2 project water bodies.

Name	Average Abundance	Average Similarity	Contribution %	Cumulative %
<i>Puntius sophore</i>	23.70	2.17	10.43	10.43
<i>Channa punctatus</i>	17.60	1.68	8.11	18.53
<i>Nematopalaemon tenuipes</i>	21.36	1.26	6.05	24.58
<i>Channa striatus</i>	18.73	1.00	4.83	29.42
<i>Mystus tengra</i>	13.98	0.92	4.42	33.83
<i>Xenentodon cancila</i>	11.50	0.91	4.38	38.21
<i>Glossogobius giurus</i>	12.81	0.80	3.86	42.07
<i>Mastacembelus armatus</i>	17.47	0.79	3.78	45.86
<i>Nandus nandus</i>	8.36	0.74	3.57	49.42
<i>Wallago attu</i>	30.16	0.64	3.09	52.51
<i>Labeo rohita</i>	15.94	0.61	2.96	55.46
<i>Macrogathus aculeatus</i>	9.21	0.57	2.74	58.21
<i>Puntius ticto</i>	12.13	0.56	2.72	60.92
<i>Heteropneustes fossilis</i>	7.65	0.54	2.62	63.54
<i>Colisa fasciatus</i>	8.32	0.48	2.29	65.83
<i>Cirrhinus mrigala</i>	15.63	0.46	2.19	68.02
<i>Lepidocephalus guntea</i>	6.93	0.39	1.86	69.88
<i>Catla catla</i>	17.46	0.35	1.70	71.58
<i>Mastacembelus pancalus</i>	10.70	0.35	1.68	73.26
<i>Macrobrachium malcolmsonii</i>	18.84	0.34	1.66	74.92

Figure 9a shows the estimates of the mean slope coefficient (b) of regressions of performance indicators with time (year) by habitat for CBFM sites. Estimates for all habitats are provided in those cases where habitat was found not to be a significant factor in determining mean slope values. Corresponding annual rates of change (%) are also showed in figure 9b.

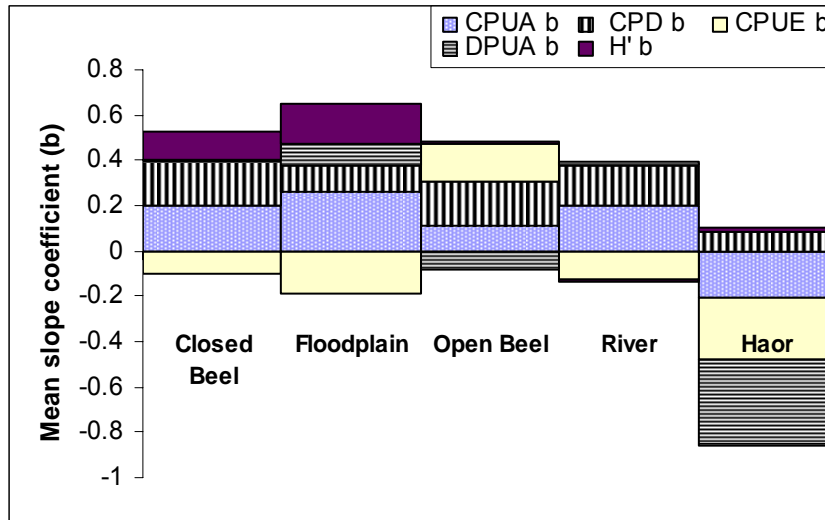


Figure 9a. Estimates of the mean slope coefficient (b) of regressions of performance indicators with time (year) by habitat for project water bodies.

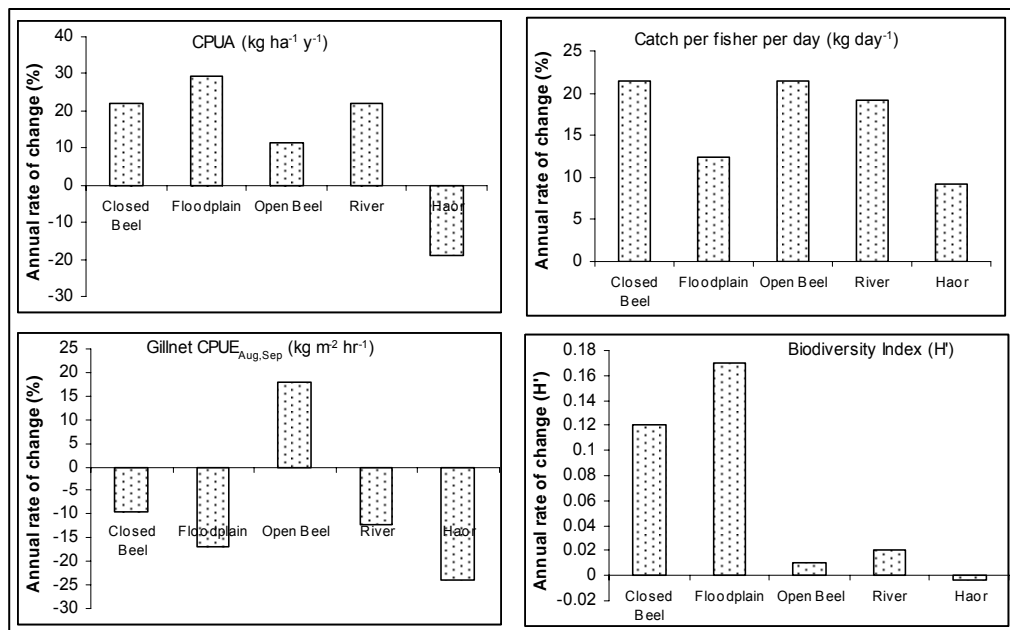


Figure 9b. Annual rates of change (%) by habitat for CBFM water bodies-based on mean slope coefficient (b) of regression. Reference line at zero indicates no change in mean value indicator.

Figure 10a shows estimates of the mean slope coefficient (b) of regressions of performance indicators with time (year) by habitat for control sites. Estimates for all habitats are provided in those cases where habitat was found

not to be a significant factor in determining mean slope values. Corresponding annual rates of change (%) are also shown in figure 10b.

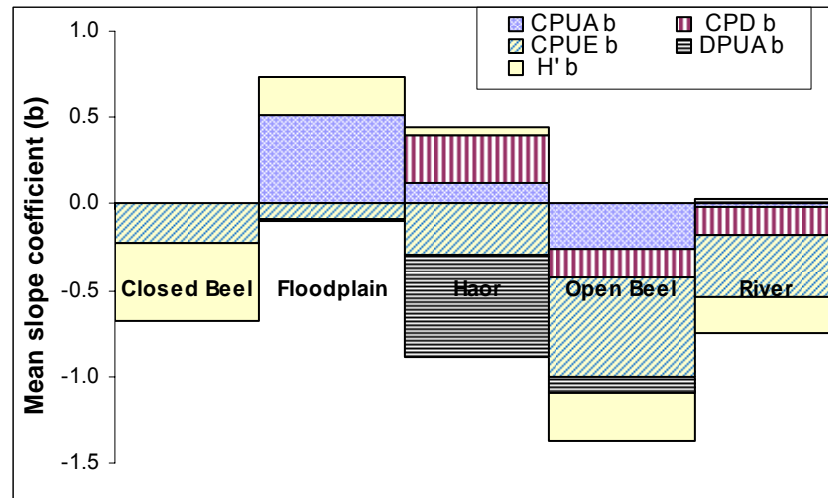


Figure 10a. Estimates of the mean slope coefficient (b) of regressions of performance indicators with time (year) by habitat for project water bodies.

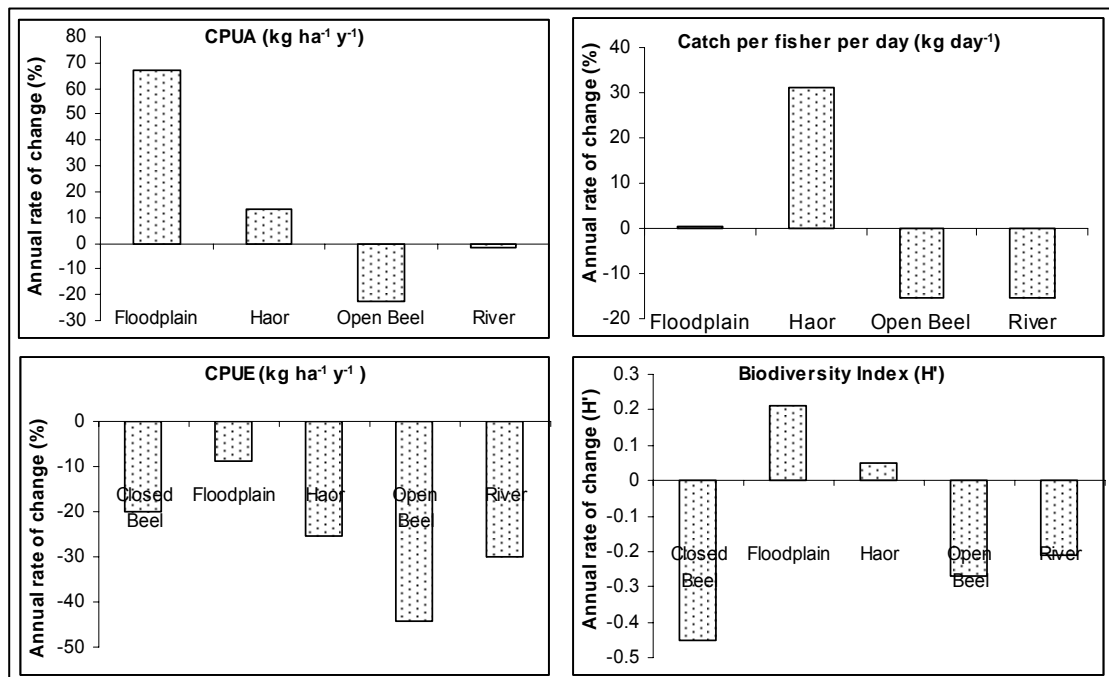


Figure 10b. Annual rates of change (%) by habitat for control water bodies-based on mean slope coefficient (b) of regression. Reference line at zero indicates no change in mean value indicator.

### What Management Interventions Worked Best?

The CBFM project has provided compelling evidence to show that the fishers managed approach was effective in a wide range of different inland water body types in Bangladesh. A site score comprising the trends for all fisheries management performance indicators (CPUA, CPD, GNCPUE, DFER, DPUA and H') was calculated for each community managed water body and compared among different habitats (Figure 11). The relative frequencies of these upwards and downwards trends indicated that CBFM activities yielded benefits at 90%, 84% and 80% of the CBFM2 water bodies managed by Fishers, Community and Women respectively. However at control sites only 37% of sites had significant improvements and these were mainly in large floodplain sites. However, experimentation or adaptive approaches to management will be required to determine which are most important. In conclusion, community-based fisheries management appears to perform significantly better than the existing management regime in Bangladesh.

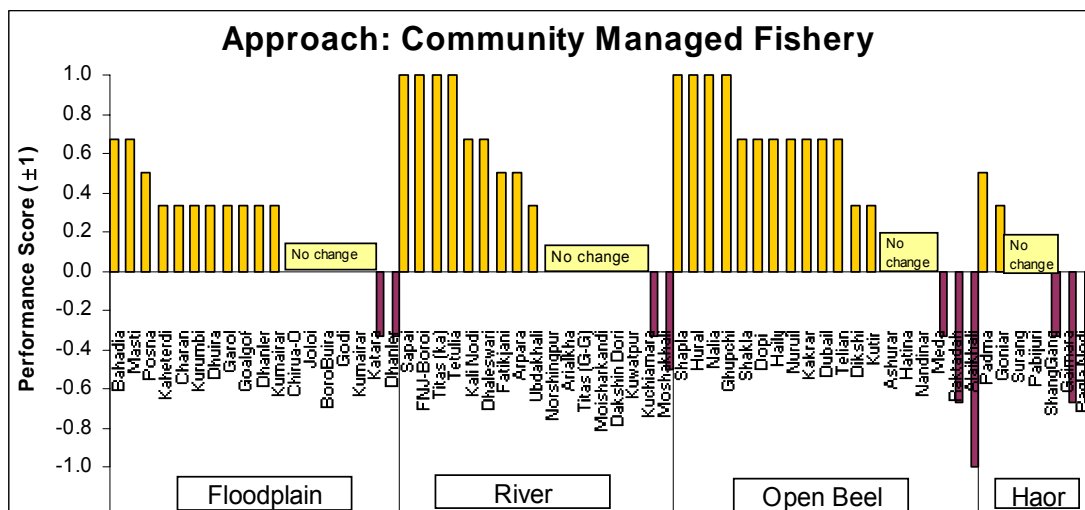


Figure 11. Plot of water bodies score comprising the trends of all fisheries management performance indicators (CPUA, CPD, GNCPUE, DFER, DPUA and H') compared among different habitat through community management approach.

## DISCUSSION AND CONCLUSIONS

According to the relative frequency of upward and downward trends in performance indicators at CBFM and control sites, the CBFM Project appears to have benefited fish production (CPUA), abundance (CPD and GNCPUE) and biodiversity (H') at participating sites, but has had little or no apparent effect on destructive fishing practices (DFER) or fishing intensity (DPUA). Except for fish abundance indicated by gillnet catch rates (GNCPUE), which was found to be declining at significantly more sites than it was increasing, no significant ( $p < 0.05$ ) overall trends in management performance were detected at control sites.

The analysis of slope coefficients corresponding to these trends generated largely consistent results to those above but indicated that some of the above

conclusions were habitat specific. The CBFM was found to have a significant beneficial effect on CPD, GNCPUE and H', but not CPUA or DPUA after accounting for any natural variation among habitat type and region.

Mean annual increases in fish abundance, indicated by CPD, were significantly greater at CBFM compared to control sites, particularly in river habitat (20% per annum). Furthermore, the mean change in fish abundance at control sites was not significantly different from zero. Fish abundance increased in response to a decrease in fishing intensity (DPUA) and closed seasons, but these factors explained only 15% of the total variation in fish abundance. Whilst gillnet net catches rates (GNCPUE) indicated no significant change in fish abundance at CBFM sites, a significant ( $p < 0.05$ ) decline was detected at control sites equivalent to almost 30% per annum.

The fishing power index (FPI) was found not to have increased significantly through time within any habitat suggesting that the CPD indicator is unlikely to be biased from changes in fishing power. Unlike the annual perspective of the CPD indicator, GNCPUE provides an index of fish abundance only during a two month period during the flood season when gillnets tend to target migratory whitefish species (Welcomme 1985). GNCPUE may therefore be a poor indicator of the abundance of less migratory blackfish species, and thus the entire assemblage. Therefore each indicator has advantages and disadvantages.

Irrespective of the choice of indicator, the results suggest that fish abundance does benefit from CBFM manifest either as increasing, or at least sustained, abundance.

Rates of change in biodiversity were found to vary significantly among habitat and were on average also significantly greater at CBFM compared to control sites. Improvements in biodiversity at CBFM sites through time were significant in closed and floodplain beel habitat. Significant improvements in biodiversity were also detected for control sites belonging to floodplain beel habitat.

The slope coefficient analyses also supported the conclusion that the CBFM appears overall to have had little effect on fishing intensity (DPUA) although significant declines (31% per annum) were found at CBFM sites belonging to haor beel habitat and modest (10%) but significant increases were observed in floodplain beel habitat. No significant changes in fishing intensity were detected at control sites.

Variation in the slope coefficient estimates for the individual management performance indicators at CBFM sites was significant within the majority of habitats categories but no discernable patterns were evident among the indicators to suggest that overall CBFM performance varied significantly among habitat, nor site size, geographic region or facilitating NGO (Halls et al. 2006a).



The mean composite measure of management performance (site score) was found to be greater at CBFM compared to control sites in four of the five habitats and significantly ( $p < 0.05$ ) greater in three. The size of the water body (MAXAREA), the NGO facilitating management and the ownership regime (JALMOHOL) were also found to have no detectable effects on the site score estimates among CBFM sites (Halls et al. 2006a).

Whilst co- and community-based management approaches have long been advocated as a means to address the failures associated with conventional 'top-down' approaches to management (Pomeroy & Williams 1994; Hoggarth et al. 1999; Wilson et al. 2003), few studies have quantitatively demonstrated their benefits. On the basis of the results presented here, it is concluded that the practices implemented under the Community Based Management (CBFM) Project in Bangladesh have improved, or at least sustained, fish abundance and biodiversity without significant loss to production compared to those at the control sites. In other words, the community-based approach adopted under the Project appears to give rise to better management performance than the existing top-down government-driven regime.

Increases in fish abundance and fishing intensity explained much (60%) of the variation in fish production. A companion paper (Halls and Mustafa 2006) describes empirical relationships between fishing intensity and production derived using data from this study to provide estimates of maximum yield and corresponding fishing effort by habitat. These estimates may help inform future CBFM programmes and provide useful starting points for experimental or adaptive management programmes in similar habitats (see below).

Greater uncertainty surrounds which factors were responsible for improvements in the remaining indicators. Closed seasons appear significant but explain less than 15% of the variation in fish abundance (CPD) after also accounting for differences in fishing intensity, and only 24% of the variation in biodiversity (Halls et al. 2006a). Halls et al. (2001) predicted that closed seasons during the rising flood period (April-July) would significantly increase floodplain fish production and abundance by improving both recruitment and yield-per-recruit. Whilst the effect of gear bans on the response of performance indicators could not be separated from those arising from closed seasons (because the two interventions were implemented together at almost all CBFM sites) the observed trends in destructive gear use (DFER) indicated that gear bans had been ineffective and therefore were unlikely to have been responsible. Hoggarth & Kirkwood (1996) predicted that gear bans do not increase overall yield, but can be an effective means of redistributing benefits to preferred gear of fisher socio-economic categories.

Reserves have been recommended as potentially effective means of controlling fishing mortality in the floodplain environment (e.g. Hoggarth et al. 1999; 2003) but studies robustly demonstrating their efficacy, and recommendations concerning minimum reserve areas, are sadly lacking. Here, reserves were found to have no detectable effect on any of the management performance indicators. Their apparent ineffectiveness here may reflect poor enforcement, inappropriate reserve location or simply that

they were too small to produce any detectable effects. Seventy-five percent of the reserves occupied less than 10% of the dry season area of CBFM sites.

Up to 12 CBFM and control sites were also stocked to improve production. Estimates of fish production employed in the CPUA, CPD and GNCPUE indicators excluded landings of stocked fish although the effect of stocking activities on performance indicators was considered. A second companion paper (Halls et al. 2006b) describes a simple bio-economic model to help farmers select the most profitable and risk adverse stocking strategies based upon data collected under the CBFM Project.

Future projects or initiatives may choose to place greater emphasis on identifying effective habitat-specific management interventions and arrangements with respect to specific management objectives. For example, CBOs might be encouraged to experiment with closures to the fishery of different durations or during different months of the year (seasons), allocate different proportions of their dry season fish habitat as reserves, or control fishing effort at different levels as a means of determining the best strategy to increase fish production, abundance or biodiversity.

The CBFM Project has already demonstrated that CBOs are motivated to share and disseminate their knowledge and experiences through meetings, exchange visits and newsletters (Halls et al 2005). Consideration might therefore be given to strengthening these types of CBO networks to support experimentation and learning under future initiatives. Halls et al (ibid) describe guidelines for designing data collection and sharing systems to support this type of adaptive management approach.

Future impact studies of this type would benefit from greater consideration to the sampling design to avoid the problems encountered here arising from missing cells and an unbalanced design, and to optimize the use of project resources.

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Conference Paper 04

A green horizontal band with silhouettes of people and a heart.

## Turning Social capital into Natural Capital: Changing livelihoods of fishers through CBFM

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## ABSTRACT

This study investigates the impact of the Community Based Fisheries Management Project (CBFM-2) on household welfare by examining how the various types of livelihood assets contribute to household income. The CBFM projects have been implemented since 1995, through a partnership of the Department of Fisheries, 11 NGOs and the WorldFish Center, working in 116 water bodies with more than 23,000 households living around the project sites. The major objective of the CBFM was to build local fishery community organizations by providing training, building social awareness and giving access to credit facilities, with the aim of enhancing poor fishers' capability to access to livelihood assets.

The study reports on the results from an impact survey of 2,826 households from 40 water bodies in four different regions of Bangladesh. It was seen that CBFM households had significantly improved their social capital and have got better access to land and fishing grounds compared to households in non-CBFM control sites. The results of regression analysis show that the contributions of social capital and natural capital factors were important in improving household incomes. Future policy options need to be considered as a priority to invest more in human, physical and natural capital assets.

## INTRODUCTION

Community Based Fisheries Management (CBFM) has emerged as one of the most viable options for managing fisheries resources in many developing countries including Bangladesh. The fisheries of Bangladesh support the livelihoods of millions of poor people but capture fisheries are declining as a result of high rates of exploitation and habitat degradation. More than 70% of households fish in the floodplains either for income or food (Minkin et al., 1997; Thompson et al., 1999). Many of the fisheries resources are state property and management control very often falls into the hands of rich and influential lessees. The leaseholders tend to allow fishing by as many fishers as are willing to pay user fees to ensure that they make a profit (Ullah, 1985; Naqi, 1989; McGregor, 1995).

Access to resources has been a constant debate in rural economies and the livelihoods of rural households. Increased access to resources depends on which assets are more relevant to the types of livelihood. Indicators of livelihood security can be grouped under five types of capitals: social capital, natural capital, financial capital, physical capital and human capital (DFID, 1999).

- Social capital relates to the social resources (networks, membership of groups, and relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods.

- Natural capital represents the natural resource stocks from which resource flows useful for livelihoods are derived (e.g. land, water, wildlife, biodiversity, and wider environmental resources).
- Financial capital represents the financial resources which are available to people (whether savings, supplies of credit or regular remittances or pensions) and which provide them with different livelihood options.
- Physical capital is the basic infrastructure (transport, shelter, water, energy and communication), the production equipment and means that enable people to pursue their livelihoods.
- Human capital is the skills, knowledge, labour and good health important to the ability to pursue different livelihood strategies.

Sen (1997) argues that capabilities enhance people's ability to be agents of change. Sustainable rural livelihoods can be conceptualized in terms of recent debates on access to resources (Berry, 1989; Blaikie, 1989), asset vulnerability (Moser, 1998), and entitlements (Sen, 1981).

The fishers have limited access to livelihood assets, they are mostly illiterate, landless, and have poor housing condition, lack of employment, poor capital assets and lack of funds. The security of access to fisheries resources is vital for the livelihood of poor fishers. It is argued that inequality in livelihood assets among the user groups might be associated with different degrees of control and access of the fisheries resources.

## COMMUNITY BASED FISHERIES MANAGEMENT

The Community Based Fisheries Management (CBFM) Project, funded by the Ford Foundation and the UK Government's Department for International Development (DFID), aimed to promote the sustainable use of, and equitable distribution of benefits from, inland fisheries resources by empowering communities to manage their own resources. The project was implemented in two phases: 1994-1999 (CBFM-1) and 2002-2005 (CBFM-2) by the WorldFish Center and the Government of Bangladesh's Department of Fisheries (DoF) with the support of 11 Non Government Organisations (NGOs). By 2005 the project has facilitated the establishment of 130 Community Based Organisations (CBOs) in different types of water bodies located in regions throughout Bangladesh representing more than 23,000 poor fishing households.

The water bodies under the project are diverse, comprising mostly of rivers, closed beels, and open beels, but also significant areas of floodplains (largely private land) and small beels (under 8 ha). Each CBO was responsible for the management of a defined area of fish habitat of different types of water bodies. The CBOs were encouraged to implement several management interventions to help manage their fishery resources in a sustainable manner.

In closed and open beels, CBOs had to take over a commitment to pay the lease fees in return for which they secured control over management of the water body. This involved a clear change in tenure and access as in most cases, fishers in the newly established CBFM community groups (CBOs) had no access to fishing in those water bodies before the project because the lease was held by a single person or a 'fisherman's co-operative' controlled by a few rich and influential individuals.

In floodplains, the land was privately owned before the project and there was no effective change in access or tenure because no lease was required. The community groups operating in these areas were encouraged to implement measures to improve the state of the fish stocks in the floodplain, in particular, by excavating dry season refuges for fish. The situation in rivers was similar because leasing was abolished in 1995. This led to a free-for-all which tended to favour the most powerful who could afford to install and maintain fish aggregating areas known as kathas.

The main objective of the project has been to test models for sustainable management of the fisheries, it has also tried to encourage fishers and others living in project areas to develop alternative livelihoods through training and credit support. This paper will provide information on whether poor fishers are benefited in terms of increasing income by efficient and equitable access to livelihood assets.

## METHODOLOGY

### Sampling and Data Collection

The main tool for assessing livelihood impacts was a pair of questionnaire-based field surveys - a baseline study carried out in 2002 shortly after the start of CBFM-2 and an impact study carried out in mid-2006.

The survey covered 1994 households (including both project beneficiaries and others) at 34 project water bodies plus 832 households in 6 control water bodies. The questionnaire used in the impact survey was based on the baseline survey format which separated households into 5 categories based on their poverty and fishing profiles (Table 1).

Table 1 - Household categories

Category	Household type	Characteristics
I	Poor fisher	Fishes for income or both for income and food, usually does labouring work, and possesses no agricultural land
II	Poor – Non-fisher	Does not fish for income, has no agricultural land, usually does labouring work, but not service or professional jobs

III	Moderately poor fisher	Fishes for income, has some agricultural land but less than 100 decimals (0.4 ha), or if occupation includes service or professional job and has thatched house
IV	Moderately poor – Non-fisher	Does not fish for income, has some agricultural land but less than 100 decimals (0.4 ha), or if occupation includes service or professional job and has thatched house
V	Better off	May or may not fish for income, has land more than 100 decimals (0.4 ha) and/or has someone with a service or professional job and a tin house, or has a pucca (concrete) house

The baseline and impact questionnaires covered a wide range of socio-economic and livelihood parameters, details of aquatic resource use, fishing involvement, access, compliance, existing NGO support and scales to measure more subjective indicators including social capital. Survey results were analysed using descriptive statistics to show differences in the key livelihoods indicators according to water body type (closed beels, open beels, floodplains, rivers). Comparisons were also made against households from control water bodies.

### Factor Analysis

Social capital cannot be measured by a single variable. A set of variables were used to measure the social impact. Factor analysis was used to construct the indices of social capital. Principal Component Analysis is widely used to find the important principal components as un-rotated factor based on the criteria of eigen values greater than one. PCA extracts a maximum amount of variance to compute the factor scores calculated only from highly loaded factors. The factor scores are weighted according to the factor loadings. To ensure the correlations between the factors, the Bartlett's test of sphericity (Bartlett, 1954) and Kaiser-Meyer-Olkin (KMO) was used. The Bartlett's test of sphericity was significant ( $p < 0.05$ ) and considered appropriate. The KMO index ranges from 0 to 1, with 0.6 suggested as minimum value for a good factor analysis (Tabachnick and Fidell, 1996). The variables used in the study are shown in table 2.

Table 2: Definition of Variables



**Social Capital Variable**

Membership = membership in organizations (5=most important; 1=less important)

Influence = influence over access to resource (5=strong influence; 1=no influence)

Participation = participation in decision making (number of times)

Knowledge = fisheries management knowledge (5=full knowledge;1=no knowledge)

Trust = level of trust (5=strongly agree; 1= disagree)

**Physical Capital Variable**

Housing = value of house structure (Taka)

Latrine = value of water sealed latrine(Taka)

Capital assets = Value of a set of household assets (Taka)

Homestead land = area of homestead land (ha)

Fishing equipment = value of equipment (Taka)

Fishing area = measure of fishing area (ha)

**Human Capital variable**

Education = education of household head (years of schooling)

Age = age of household head (year)

Employment = total employment days

**Other assets**

Credit = amount of credit received by household (Taka)

Cultivable land = cultivable land owned by household (ha)

Household size = number of household members

**Regression Analysis**

The factors that contribute to household income are analyzed using a regression model. As shown in Equation (1) the explanatory variables included in the model consist of those measuring various asset endowments and demographic characteristics of the households. The dependent variable is the welfare of the household measured as annual household gross income from different sources.

Equation (1) is estimated separately using the survey data from households in the sampled CBFM (project) and non-CBFM (control) areas:

$$Y = \alpha + \beta_1 SC + \beta_2 PC + \beta_3 EDN + \beta_4 CRT + \beta_5 CUL + \beta_6 EMP + \beta_7 AGE + \beta_8 HS + \beta_9 FISA + \beta_{10} ATCM + \text{Error},$$

(1)

Where

Y = household annual income (taka)

$\alpha$  = constant

$\beta_1$  to  $\beta_{10}$  = coefficient of variables for household asset endowments and household characteristics

SC = household endowment of social capital (index)

PC = household endowment of physical capital (index)

EDN = household education (years)

CRT = credit received by households (taka)

CUL = area of household cultivable land (ha)

EMP = employment days of households (days)

AGE = age of household head (years)

HS = household size (number)

FISA= area fished by households (ha)

ATCM= household head attended in community meeting (number)

Error

## RESULTS AND DISCUSSION

### Impact of CBFM on Household Income

Descriptive statistics show that there were large rises in the annual incomes of households over the four years between baseline and impact. Average household incomes<sup>1</sup> in project areas rose by 31%, and increased significantly ( $P < 0.01$ )<sup>2</sup> in all types of water bodies – by 21% in closed beels, 24% in open beels, 37% in floodplain beels and 57% in rivers. However, these rises were matched by similar increases (average, 37%) in the household incomes of people living in control sites - 22% in closed beels, 42% in open beels, 33% in floodplains and 30% rivers (Figure 3.1). This means that the overall income gains in project areas cannot be directly attributed to the project. There have been substantial rises in average income levels in general – a clear trend that has been recognized in other recent livelihood studies in Bangladesh (Sen 2003; CARE/LMU 2005).

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<sup>1</sup> Adjusted for inflation

<sup>2</sup>  $P < 0.01$  = highly significant,  $P < 0.05$  = moderately significant

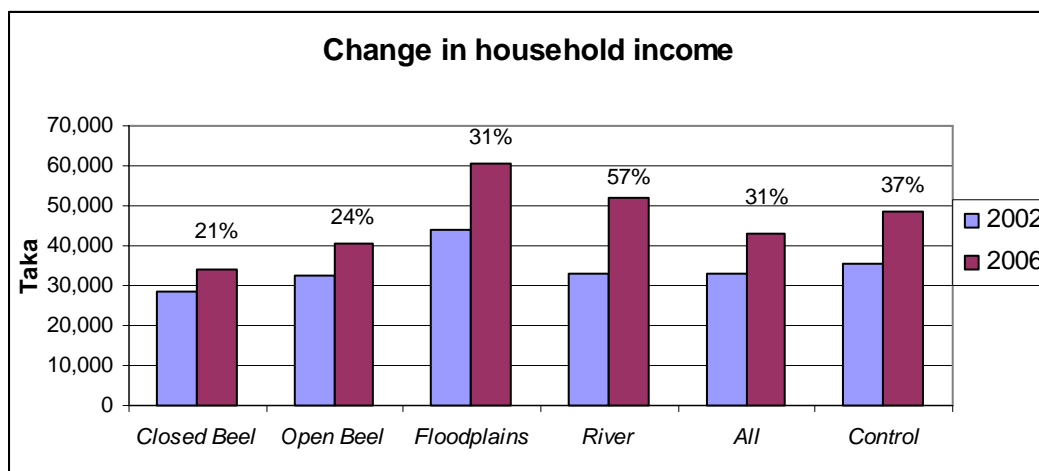


Fig.1. Household incomes

### Incomes from fishing

It was expected that the project activities would result in increase fish production in project water bodies. This suggests that there should be clear increases in fishing incomes, particularly by project fishers. Table 3 shows fishing incomes split by water body type and occupation and compares project fishing incomes against those in control sites.

Overall annual average fishing incomes by fishers in project sites increased by 21% from baseline to impact from Tk 15,035 to Tk 18,189. In control sites, the increase was less, 15%, from Tk 15,076 to Tk 17,286 however this was not significantly less than the increase in project sites.

In floodplains and rivers, fishers' incomes from fishing showed large increases (104% and 60%, respectively), whereas in open beels fishers' incomes from fishing only rose by 9% and fishers' incomes from fishing dropped by 23% in closed beels. The trends in control sites were significantly different to those in project river and floodplain sites indicating that the large increases in fishers' incomes from fishing in these project sites can be attributed to the CBFM-2 project activities. Trends in fishers' incomes from fishing in closed and open beel control sites were not significantly different to those in project sites. Although there was an apparent rise in non-fishers incomes from fishing in control open and closed beel sites, these were from very low baseline levels. Nevertheless it may illustrate that it is easier for people to move into and out of fishing in control areas compared to project areas as there are fewer controls over who can fish and when they can fish.

Table 3. Household fishing incomes split by water body type, occupation and project vs. control (Tk/year)

	Project			Control		
	2002	2006	% rise	2002	2006	% rise

Open Beel	Fisher	15917	17256	+9%	14585	18859	+30%
	Non fisher	913	629	-32%	609	2125	+249%
	Better off	1867	1386	-26%	2441	4012	+65%
Closed Beel	Fisher	12967	9973	-23%	9956	7378	-26%
	Non fisher	731	826	+13%	553	1257	+128%
	Better off	2377	2431	+3%	1150	809	-30%
Flood Plain	Fisher	15599	31761	+104%	13817	12314	-7%
	Non fisher	5023	1590	-69%	2458	2801	+14%
	Better off	7682	5855	-24%	5910	6230	+6%
River	Fisher	14573	23271	+60%	22379	20797	+7%
	Non fisher	1097	1980	+81%	3687	666	-820%
	Better off	3542	3943	+12%	668	1050	+58%
All	Fisher	15035	18189	+21%	15076	17286	15%
	Non fisher	1316	1015	-23%	1509	1773	18%
	Better off	2811	2443	-13%	2392	3304	38%

### Household income sources/Income Diversification

Data in the impact survey shows that project fishers' incomes from farming and remittances increased significantly over the project period while their earnings from wage labouring showed a significant decline. Although fishers generally have few landholdings, they are now getting access to land through leasing or share cropping. Asaduzzaman (2003) and Sen (2003) argue that the agricultural sector remains the major sector of the economy and the better off households are in the best position to capitalize on the shift to high-value production. Agricultural growth is playing an important role in rural poverty reduction.

The CBFM study found that fishers have shifted their employment from wage labouring to self employment activities in the agriculture (farming and fishing), however the control fishers still tend to rely on the wage labouring for their livelihoods. The availability of micro-credit and fishing access may be important factors for increasing local employment opportunities.

The increased income from remittances due to out migration was found to be significant in project sites compared to the control sites. For poor households, migration has been stress driven. They usually migrate to other regions or districts for seasonal employment in paddy harvesting, road and building construction, rickshaw pulling and other labouring activities. The CARE/LMU study (2005) found that household members are increasingly residing temporarily away from their village homes to find better work.

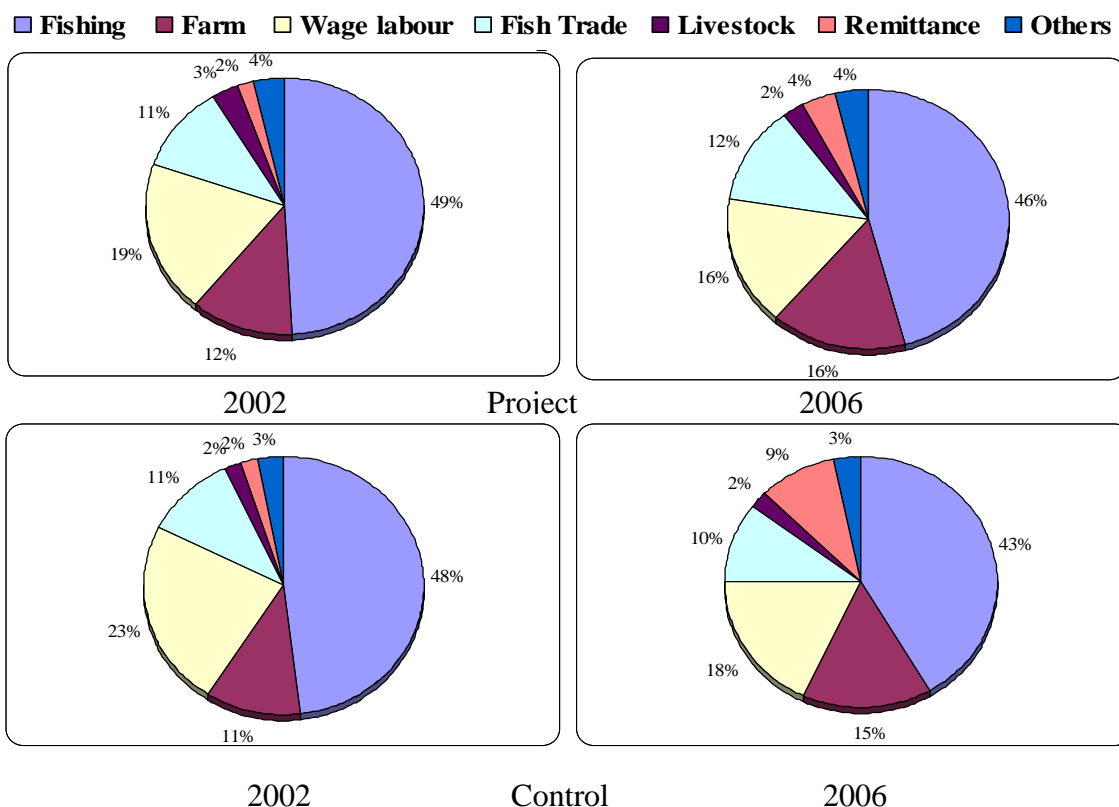


Fig. 2: Fishers income from different sources (% of annual income)

### Access to fishing

In most of the CBFM-2 project sites (closed beels, open beels and floodplains) fishers are now able to participate in fishing in the water bodies nearest to their homes compared to the situation before the project where access to water bodies was highly restricted. In the rivers, however, the number of fishers who are fishing in other water bodies has increased. The overall number of fishers who participated in fishing in the closed beels and floodplains in the project sites was less in 2006 compared to 2002 (table 4). In the control sites, the fisher's participation to fishing has not been concentrated in their own water bodies except in the floodplains. It indicates that CBFM-2 fishers have increased their awareness levels and had more of an incentive to use their own fisheries efficiently.

Table 4. Number of fisher got access to fishing by water body types (% of fisher)

	Project			Control		
	2002	2006	% change	2002	2006	% change

<b>Closed Beel</b>						
Single water body	199	196	-1.5	67	62	-7.5
More than one water body	109	77	-29.4	13	17	33.3
All	308	273	-11.4	80	79	1.3
<b>Open Beel</b>						
Single water body	383	437	14.0	157	174	10.8
More than one water body	171	147	-14.0	18	67	272.2
All	554	584	5.4	175	241	37.7
<b>Floodplains</b>						
Single water body	36	56	55.0	43	60	39.5
More than one water body	68	36	-47.1	39	24	-38.5
All	104	92	-11.5	82	84	2.4
<b>Rivers</b>						
Single water body	117	103	-12.0	45	58	29.0
More than one water body	37	50	35.1	19	12	-36.8
All	154	153	-0.6	64	70	9.4

## Land and household assets

The baseline and impact surveys recorded land ownership and rented or sharecropped land holdings. Land is regarded as one of the most important assets for poor people. The results show that fishers in both project and control sites have increased their land holdings – mainly by renting or sharecropping but also by purchasing land. Fishers in project sites increased their land from 31 decimals in 2002 to 43 decimals in 2006 while in the control sites fishers increased their land from 33 decimals in 2002 to 54 decimals in 2006. In contrast, the better-off households reduced their owned as well as shared or rented land over the project period. They have reduced their shared land from 41 decimals in 2002 to 30 decimals in 2006 (Table 5).

The increasing land holdings of fishers correlates well with the finding that agriculture has become more important for many fisher households. This indicates that the poorest people have improved their financial situation allowing them to invest in land over the project period. These self-employment opportunities at their farm and related activities may enable them to resist frequent migration.

Table 5. Land ownership, share cropped and rented land by household category in project and control sites (decimals)

	Project			Control		
	2002	2006	% increase	2002	2006	% increase
Fisher						
Own Land	34	39	16	31	36	16
Lease/share land	31	43	40	33	54	62

Total	65	83	27	65	90	39
Non fisher						
Own Land	53	56	5	47	56	19
Lease/share land	36	35	0	35	37	6
Total	89	92	3	83	94	14
Better off						
Own Land	334	325	-3	349	362	4
Lease/share land	41	30	-28	43	40	-8
Total	375	354	-5	392	402	2
All						
Own Land	104	102	-2	106	106	0
Lease/share land	35	37	5	36	43	20
Total	139	138	-1	142	150	5

### Micro-credit

Households in both CBFM project sites and control sites increased their access to credit from a range of credit sources. NGOs were an important source of credit and both beneficiary and non-beneficiary households more than doubled the amount of credit taken over the last four years of the CBFM project.

Beneficiary households had a 273% increase in the amount of credit from 'interest-free' sources such as might be used for mitigating short term crises, (although this was from a very low initial average amount), while the average amount of credit received from this source by non-beneficiaries in project sites decreased and non-beneficiary households in control sites increased their access to this type of credit by only 50%. This indicates that CBO members have become more trusted in lending and borrowing at the village level.

Beneficiary households have also become less reliant than other households on money lenders (mohajans). This is the most exploitative type of lending as they charge very high interest rates. Households in the control sites have become much more reliant (173% increase) on moneylenders as have non-beneficiary households (163% increase) in project sites, while beneficiary households have only increased their borrowing from mohajans by 34% over the project period (Table 6). The figures also show that all types of households greatly increased their overall exposure to credit meaning that the potential negative impact of mohajan credit did not follow through to affect household incomes.

Table 6. Micro-credit received by beneficiary household category and by source (taka/hh)

Source	Beneficiary			Non Beneficiary			Control site		
	2002	2006		2002	2006		2002	2006	

	Average Tk/hh		%	Average Tk/hh		%	Average Tk/hh		%
Mohajan	562	754	34.1	423	1114	163.0	641	1753	173.5
Grocery shop	140	165	18.2	127	77	-39.6	204	151	-26.3
Bank	280	408	45.8	800	1177	47.1	685	824	20.2
Local society	308	387	25.4	429	446	3.9	291	273	-5.9
Relatives	635	1144	80.2	948	1386	46.2	884	1613	82.4
Someone else	97	363	273.5	356	295	-17.2	437	659	50.9
NGOs	1631	4221	158.7	1065	2443	129.3	1390	2898	108.5
All	3654	7644	109.2	4226	7214	70.7	4637	8343	79.9

## Social Capital

In order to measure changes in social capital, an index was constructed using Principal Component Analysis. Six variables with high loadings were then aggregated to form the Social Capital Index.

Table 7. Social Capital - Factor Pattern

Performance Indicator	Factor Loading
Membership in organization	<b>.693</b>
Participation in decision making	<b>.685</b>
Level of knowledge	<b>.622</b>
Influence over decision making	<b>.610</b>

Extraction Method: Principal Component Analysis.

The scores of four separate items were aggregated to form the Social Capital Index. The most dominating factor found in social capital is household's membership in organizations (0.693). The majority of the poorer households have affiliation with production oriented organizations such as NGOs, various cooperative societies and local credit management societies. The reason why the poor fishers are not involved in the social, religious and cultural organization is mainly due to their poverty. Their primary concern is to look for work for their daily food and other necessities. Good leadership exists among the community in three project sites. In both *Chapandaha* and *Hamil beel*, the CBFM participants elected their executives for *Beel* Management Committee through voting. The organized fishers have participated in stocking and other production related activities such as protecting and harvesting fish. Poaching is a common threat for stocked water bodies. This has been controlled through surveillance provided by the fishers in the project sites. It has been observed that there is improvement in fishers' confidence in using fish culture technologies. The second social capital



factor is found that the participants have actively participated in the decision making on fisheries management rules (0.685). Fisheries management rules introduced by the management committee aim to enhance fish production. These rules are fishing restriction in the fish sanctuary, restriction on destructive gear used and three months closed season. The fishers strictly obeyed the first rule but the other two rules were sometimes violated when they could not find any income-earning work. The level of knowledge is important in social capital variable (0.622). Low level of formal education is observed among the fishing communities. Partner NGOs conducted awareness campaigns and training programs on leadership, accounting management, productive activities and fisheries management to improve fishers' level of knowledge. The last social capital variable is the fishers' influence on resource use (0.610). The fishers have exclusive access to use the fisheries resources and can resist outside threat. They can decide who, when and where to fish, and thus they are able to control overfishing on their own.

### **Physical Capital Index**

Generally poor fishers are landless or functional landless. They have small amount of productive assets. Physical assets endowments are a good indicator of income, welfare and livelihood. The study has found that the organized fishers have improved their assets over the last couple of years such as using better construction materials for their houses and fitted with flush latrines. The level of income has increased and they have got some other productive assets to be used in creating additional income such as rickshaw pulling, petty trade (grocery, tea stall and fish), and crop cultivation. Women are now engaged in cattle and poultry rearing using credits from the NGOs.

In constructing the Physical Capital Index using the Principal Component Analysis, the significant variables are house materials, area of homestead land, sanitary latrine and productive assets. These four variables load highly on a single common factor (Table 8).

**Table 8: Physical Capital: Factor Pattern**

Performance Indicator	Factor Loading
Value of house	<b>.748</b>
Area of homestead land	<b>.744</b>
Value of sanitary latrine	<b>.697</b>
Value of durable assets	<b>.684</b>

Extraction Method: Principal Component Analysis.

The scores of four separate items were aggregated to form the Physical Capital Index. Land is a very scarce resource in Bangladesh. The average area of homestead is 0.05 hectare in the study area. Most fisher households do not own any cultivable land. However they cultivate land owned by others either through sharecropping or mortgage arrangements. More and more poor fishers in all survey areas are engaged in high-yielding variety (HYV) *boro* rice cultivation.

This indicates that poorest fisher could be employed in the agriculture and non agriculture sectors. Improvement of housing is found to be an important factor for the rural households. The first important variable is the value of house (0.748). The area of homestead land is the second dominating variable (0.744), followed by sanitation condition (0.697). The CBFM participants have greater awareness in health and sanitation. NGOs have provided with sanitary latrines at low cost to their group members. The last important variable is the productive and household assets (0.684) such as livestock, rickshaw/vans, shallow tube well, bicycle, watch, radio and television sets. These assets play an important role as safety nets during unemployment and occurrence of natural crises such as floods, or cyclones which results in loss of fish and other crops.

### **Human, Financial and Natural capital Assets**

The poor fishers are generally illiterate; access to formal education is very limited. Human capital includes age of household head, attendance in community meetings, participate in trainings and access to information. Only the level of formal education variable is significant in the principle component analysis. The role of financial capital is very important to explain livelihood of poor fishers. Fishers have very limited access to credit; they are not able to pay lease money for fisheries resources and can not invest in productive sector to generate income. Financial capital includes the variables: amount of credit received, value of household assets, value of fishing equipment and income from asset sales. Only the amount of credit received variable was significant. The land and fishing ground are considered as natural assets for the fishers. Fishers are generally landless, but they have traditional access to fishing in the floodplains owned by the private landowner or open access common property. Access to fishing to such fishing grounds depends on the extent of social linkages among the community in that particular location.

One variable in each of the three types of assets was found significant in the PCA method: level of formal education for human capital, amount of credit received for financial capital and area of fishing for natural capital (Table 9).

**Table 9: Human, Financial and Natural Capital: Factor Pattern**

Performance Indicator	Factor Loading
Education level of household head	<b>.704</b>
Amount (Tk) of credit received by household	<b>.690</b>
Area of fishing by household	<b>.615</b>

Extraction Method: Principal Component Analysis.

The mean difference between project and control for the social capital index was highly positive in all types of water bodies (table 10). The comparisons between the project and control households show that the net increment for social capital score is 1.228 and for financial capital is 2.209. In Bangladesh, poor fishermen are deprived of opportunities in making fisheries management decisions. The *jalmahals* are generally controlled by the rural elites and the maximum share of

benefits from fishing goes to them. The fishermen are now on average able to participate in making fisheries management decisions in the CBFM areas. Each of the participants have received 2000 taka more in the CBFM sites compared with the control sites, which indicates that they have the potential to increase their employment and income opportunities due to the project interventions. The value of household physical assets for the project participants is higher by around 500 taka. The fishing area of the participants is higher by 0.827 hectare, however, the level of education does not show any significant difference between the project and control areas (0.027).

Table 10: Mean differences of Household Assets between Project and Control areas

Variables	Project		Control		Difference Project - Control
	Mean	Std. Deviation	Mean	Std. Deviation	
Social capital index	4.024	2.04587	2.7964	1.31348	+ 1.228
Physical capital index (1000)	5.788	6402.976	5.269	6909.645	+ 0.519
Education (year) of household head	2.42	3.281	2.15	3.217	+ 0.027
Credit (Tk) received by household (1000)	6.038	5647.979	3.829	4120.728	+ 2.209
Fishing area (ha) of household (10)	2.595	25.89290	1.768	25.04423	+ 0.827

Under the CBFM project the government has transferred the use rights of water bodies and provides administrative support to the fishers. The NGOs have full time staffs at the village level that facilitate coordination between the government and the fishers. The organized fisher's participation in making decisions has increased that contributed to better management of fisheries and improved access to livelihood assets. The CBFM participants elect their executives for Beel Management Committee through voting. The fishers have improved social linkages that enhance their ability to gain economic power and livelihood security in the project areas.

### 3.2 Regression Analysis

Multiple regression analysis is used to examine the link between the household income and various livelihood asset variables. The equation as specified in Section 2.3 is estimated separately for the project and control sites by the Ordinary Least Squares technique. The results of regression are presented in Table 11.

The results indicate that the social capital, employment and area of fishing are important predictors of household income in the project area. In the control areas education, household size and age variables are significant. The contribution of social capital factor is an important variable in determining household income.

Thus social factor plays a very important role in poverty alleviation in Bangladesh.

Table 11: Relationships between livelihood assets and Household income

Variables	Model 1: Project		Model 2: Control	
	Estimated Coefficient	<i>t</i> Statistic	Estimated Coefficient	<i>t</i> Statistic
INTERCEPT	6449.7	.580	20906.6	1.848
SC	2619.4	2.225**	995.2	.568
PC	-.206	-.416	-.517	-.980
EDN	413.0	.549	1693.2	2.146**
CRT	.576	1.288	.693	1.273
CUL	-19.4	-.793	-3.8	-.129
EMP	50.6	3.005***	12.9	.865
AGE	123.9	.641	717.9	3.375***
HSZ	-759.9	-.513	-5432.9	-3.914***
FISA	-167.8	-1.720*	62.0	.698
ATCM	1002.4	1.191	-385.7	-.387
<i>N</i>	120		120	
<i>R</i> <sup>2</sup>	0.22		0.21	
<i>Adj-R</i> <sup>2</sup>	0.15		0.13	
<i>F-ratio</i>	3.07		2.78	
<i>F-probability</i>	0.002		0.004	

Note: \* Statistically significant at the 10% level.

\*\* Statistically significant at the 5% level.

\*\*\* Statistically significant at the 1% level.

The impact of human development training conducted by CBFM partner NGOs helped the organized fishermen in gaining socio-political knowledge. Associational involvement encouraged them to participate actively in decision making on livelihood issues. There is also evidence that they have capability to influence their access to livelihood assets.

The coefficient for the social capital factor is significant for the project area, as expected from community based management. The regression model in Table 5 reports positive coefficient for social capital (2619) and its associated *t*-statistic is significant at the 5% level. The fishers in the project area have got easier access to credit due to their institutional identity. Access to financial capital is not only from CBFM project NGOs, other organizations are also providing credits. Grootaert and Narayan (2004) found that greater access to credit is a spillover effect due to high social capital than human capital in Bolivia.

The coefficient of fishing area is negatively (-167.8) linked but is a moderately significant (at 10% level). The implication of negative relationship of fishing area is that capture fisheries has been restricted by land owners. The land owners have introduced either fish farms called *gher* or cultivate rice crops. The organized community established fish conservation strategies such as setting up fish sanctuaries and imposed closed season ban on fishing for 2-3 months during

fish breeding periods. In the control sites the fishing area coefficient is positive (62.0) but is not a significant determinant of income.

Land is a scarce resource in Bangladesh. The coefficients are negative and not significant in the project (-19.4) as well as in the control sites (-3.8). The poor fishermen in the project areas are involved in farming mainly in share cropped land but their crops are subject to natural calamities. Poor people have limited access to financial assets due to their lack of ownership of other assets. The very poor people are not eligible for formal credit from banks and NGOs. The coefficient for credit in both project and control areas are positive (0.576 and 0.693 respectively) but are not significant predictor for household income. Although credit is very important for the participants, it is not a significant contributor to household income. The possible reason is that the poor participants used their credit for non-productive activities such as household consumption, health care and festivals.

The physical asset coefficient of both project and control areas are negative and are not significant predictors of household income. The important implication of this relationship is that the poor people cannot retain their assets during crisis periods. Flooding and other natural hazards occur almost every year, causing people to sell or mortgage their assets to meet their basic needs such as, food, house repair and health care. Bird and Shepherd (2003) reported a similar scenario in Zimbabwe. A severe natural shock could wipe out productive assets which results in increased livelihood vulnerability and reduced productivity.

## CONCLUSIONS AND POLICY IMPLICATIONS

In this paper the impact of CBFM on household welfare is examined by investigating how the various types of assets contribute to household income. Comparisons were made between the sample households from project and control areas.

Fishers income from fishing and non fishing activities increased and the income rise was higher in non-leased water bodies (floodplains and rivers) compared to leased water bodies (open and closed beels). Fishers have diversified their livelihood options and have increased access to land and fisheries in the project areas. Factor analysis shows that social capital has contributed significantly to household livelihood assets in the project area compared to control area.

The project households received higher amounts of credit from multiple sources compared to the control households, they could utilize credit for more productive activities. Beneficiary households of CBFM-2 have got access to non-exploitative sources of credit and have become less dependent on moneylenders compared to non-project sites.

The regression results indicate that the social capital, employment and area of fishing are important predictors of household income in the project area. In the control areas, education, household size and age variables are significant. The contribution of social capital factor is important to household income which indicates that this variable play a very important role in poverty alleviation in Bangladesh.

The important policy implications of this study is that the user groups of community based organizations who primarily depend on fisheries for their livelihood need strong facilitation by NGOs and government to establish access to the fisheries. Posting of experienced staff of DOF and NGOs is vital for the success of CBFM. Fisher households require assets for their security during crisis periods. There would be a strong need for establishing a social safety net so that poor fishers feel secure to use their physical assets as investments. Provision of public works at critical times may be a good option for creating employment opportunities.

Health services are extremely poor in Bangladesh and the poor people spend a good portion of income for health care. The provision of free and effective primary health care facilities at the village level should be given priority. Since the poorest fishers rely on fishing for income and their nutritional needs, the security of access to the fisheries resources need to be taken as a priority in future policy formulation in natural resources management.

The community based approach has been tested as an alternative to the current revenue orientated leasing model. Future policy makers need to consider the successes shown by this new model of community based institutional development for the management of the vast inland fisheries of Bangladesh.

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Conference Paper 05

A green horizontal band with silhouettes of people and a heart.

Legal Issues Pertaining to Community Based  
Fisheries Management

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## ABSTRACT

The Bangladesh Environmental Lawyers Association (BELA) provided legal support to the CBFM-2 project and in particular to the 130 Community Based Organisations established under the project. The project was implemented against an uncertain legal background due to many changes in the way that wetlands and fisheries in Bangladesh have been managed over recent decades. Many of the key interventions, such as sanctuaries have yet to receive legal recognition. Many currently accepted norms and practices have come about through gazette notifications or individual decisions rather than being supported by Acts or clear policies.

This paper outlines the legal background for community managed fisheries in Bangladesh and the challenges faced during implementation of the project. It also suggests what needs to happen if community managed fisheries are to become more widespread in Bangladesh.

## INTRODUCTION

### **Management of Fisheries**

In Bangladesh, the legal framework for the management of fisheries developed from two different legal regimes - “Doctrine of Public Trust” of the ancient Roman Empire in which the Government held certain common properties such as rivers and seashore in trusteeship for the free and unimpeded use of the general public and English Common Law in which the sovereign could own these resources but could not grant these to private owners if the effect was to interfere with public interest in navigation or fishing.

Under the Permanent Settlement Regulation (PSR) of 1793, the Zamindars (landlords) owned and managed flowing rivers, their tributaries, and flood plains containing depressions or beels. In 1947 under the State Acquisition and Tenancy (SAT) Act, 1950, the Government took over the rent receiving rights of the landlords as under SAT, public fisheries (jalmohals) became an estate that cannot be retained under private ownership. Most of the public fisheries are owned by the Ministry of Land, although the conservation of water bodies and fishes are entrusted with the Ministry of Water Resources, Ministry of Environment and Forest and the Ministry of Fisheries and Livestock.

The various laws on fisheries enacted during the colonial period define fisheries as “public”<sup>1</sup> and “private”<sup>2</sup>. For management purposes, “fisheries” have also been classified as “open” and “closed” water fisheries in the management guidelines.

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<sup>1</sup> Section 20(2a) (ii) of the State Acquisition and Tenancy Act, 1950

<sup>2</sup> The Private Fisheries Protection Act, 1889

The definition of “fishery” was first included in the Protection and Conservation Act, 1950 through an amendment in 1995. In this Act “fishery” means "any water body, natural or artificial, open or closed, flowing or stagnant (such as river, haor, baor, beel, floodplain, canal etc.) where activities for growing fish, or for conservation, development, demonstration, breeding, exploitation or disposal of fish or of living organisms related to such activities are undertaken, but does not include an artificial aquarium of fish used as a decorative article, pond or tank"<sup>3</sup>.

This definition is inclusive only of what is commonly understood as “inland” fisheries while the Marine Fisheries Ordinance (MFO), 1983 defines “marine” fisheries.

In general, laws on fisheries do not regulate the principles and practices of leasing or physical management of fisheries. This was attempted to be done by the Land Management Manual, 1990 that now stands thoroughly changed through subsequent administrative decisions.

The current classification of fisheries for leasing and management purposes and their leasing arrangements remain as follows:

### **Open Fishery**

The Government has abolished the leasing practice of all open water bodies vide Gazette notification dated 4 September, 1995. The rationale behind such proclamation is to protect the rights of the poor fishermen and facilitate their livelihood.

However, some open water fisheries can still be outside the purview of the above notification if the same be required by the government for development projects.

### **Closed Fishery up to 3 Acres<sup>4</sup>**

Under the existing arrangements, closed water bodies up to 3 acres are to be managed by local government authorities who are empowered to lease these out for a maximum of three years. If the valuation of the closed jalmohal is more than taka 30,000, the process is managed by an Upazila Tender Committee and the Upazila Nirbahi Officer (UNO). The final decision is made by the Upazila Development Coordinating Committee.

Local government institutions for urban areas such as the Paurashavas and City Corporations can also lease jalmohals within their geographical boundary.

At all levels, the lease for closed jalmohals has to be offered first to either fishermen’s cooperative societies, women’s cooperative societies or tribal people’s cooperative societies.

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<sup>3</sup> Protection and Conservation of Fish Act, 1950, Section 2 (1a)

<sup>4</sup> 20 April, 1994

### **Closed Fishery up to 20 Acres<sup>5</sup>**

Since 1997 by virtue of notification dated 30 September, 1997, closed jalmohals up to 20 acres are vested with the Ministry of Youth and Sports to create self-employment of the youth<sup>6</sup>. Such jalmohals can be leased out to the youth community for a period of 3-5 years. Two separate committees for City Corporation areas and areas beyond City Corporations have been proposed to lease out closed water bodies up to 20 acres within and outside City Corporation areas. The leasing shall be through tender and shall be allotted to the higher bidder. In getting the lease, trained (male and female) youth groups registered as cooperative societies get priority.

### **Closed Fishery above 20 Acres**

The Ministry of Land may lease out closed Jalmohal above 20 acres for 4-10 years to the real fisherman cooperative society.

In general, the policy documents that purport to regulate management of fisheries through leasing prescribe the following:

- Identification of leasing authority
- Requirement of tender
- Detailing of tender process
- Pre-requisition of participating parties to tender
- Approval process
- Lease period
- Mode of Appeal
- Amount to be deposited
- Mode for handing over of fishery
- Management Plan (development project)

## **LAWS AND POLICIES**

The conservation issues related to fisheries are addressed by the Protection and Conservation Act, 1950 and the MFO.

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<sup>5</sup> Public Jalmohal Management Policy, 2005

<sup>6</sup> Water bodies included in the projects on ideal village and shelter, the vested and abandoned water bodies, khas water bodies adjacent to the offices of Union Land Office, Assistant Commissioner (Land), Upazila Nirbahi Officer and the Deputy Commissioners, water bodies in enjoyment of public easement or situated within the boundary of and owned by City Corporations/Municipality/ Zila Parishads shall be outside the purview of this notification.

There are as many as five definitions of “fish”<sup>7</sup>. Under the Act of 1950, “fish” has been defined as all cartilaginous, bony fishes, prawn, shrimp, amphibians, tortoises, turtles, crustacean, animals, molasses, echinoderms and frogs at all stages in their life history<sup>8</sup>. The Act sets ‘protection’ and ‘conservation’ as its prime focus, but neither defines them nor elaborates on what should be done to promote these measures.

The Protection and Conservation of Fish Act, 1950 that came into force on 29 June, 1950 vide notification No. 5459 dated 22 June, 1950 was enacted to address the following concerns raised by the Agriculture and Industries Department in 1932:

- prevent depletion of fishing grounds
- help scientific research into fisheries
- safeguard the interests of the trade and of fishing communities
- ensure the maintenance of good order among fishermen
- ensure sanitary and hygienic conditions in the manufacture and trade of fishery products
- adopt restrictive measures about forms and dimensions of fish appliances, close times, wasteful and destructive methods of fishing

The Act of 1950 empowers the Government to prohibit:

- killing or catching of fishes of prescribed species in certain seasons
- killing or selling of fish of any prescribed species below a minimum size
- all fishing in all waters or in any specified waters for a specified period,
- destruction of fishes by drying or de-watering of any fishery<sup>9</sup>, and
- catching, carrying, transporting etc. of fishes below the prescribed size of any prescribed species throughout Bangladesh<sup>10</sup>.

The 1950 Act has, although enacted to protect "fish" and purported to regulate some of the growing concerns for gradual depletion of fishery and fish resources. As such the Act has empowered the Government to make rules regulating the depletion of fishery by pollution, by trade effluent or otherwise and also the construction of dams, bunds, embankments and other structures that may be harmful to fish<sup>11</sup>.

The Protection and Conservation of Fish Rules, 1985 prohibited the erection of fixed engines in rivers, canals, khals and beels, construction of dams and embankment other than for irrigation, flood control or drainage purposes, destruction of fish by explosives in inland or coastal territorial waters<sup>12</sup> or by poisoning/depleting water<sup>13</sup>.

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<sup>7</sup> Bangladesh Fisheries Development Corporation Act, 1973, The fish and fisheries Products (Inspection and Quality Control) Ordinance, 1983, The Marine Fisheries Ordinance, 1983, The private Fisheries Protection Act, 1889 and The Protection and Conservation of Fish Act, 1950.

<sup>8</sup> Protection and Conservation of Fish Act, 1950, Section 2 (1)

<sup>9</sup> Protection and Conservation of Fish Act, 1950, Section 3 (3)

<sup>10</sup> Protection and Conservation of Fish Act, 1950, Section 4

<sup>11</sup> Protection and Conservation of Fish Act, 1950, Section 3 (3)

<sup>12</sup> Protection and Conservation of Fish Rules, 1985, Rule 5

<sup>13</sup> Protection and Conservation of Fish Rules, 1985, Rule 6

To facilitate the augmentation and production of particular fish species including Shol (*Channa striatus*), Gazar (*Channa marulius*) and Taki (*Channa punctatus*) the Rules prohibited the catch or destruction of fish fry or parent fish of these species between 1st of April to 31st August. Except for pisciculture, the Rules also prohibited the catching of carps such as Rui (*Labeo rohita*), Catla (*Catla catla*), Mrigal (*Cirrhinus cirrhosus*), Kalbaush (*Labeo calbasu*) or Ghania (*Labeo gonius*) of any size in the waters of rivers, khals etc. during variable periods between April to July in different water bodies as specified in the schedule. The sale of carps, Hilsha (*Tenualosa ilisha*), Pungus (*Pangasius pangasius*), Silon (*Silonia silondia*), Bola (*Raiamas bola*) and Aor (*Mystus aor*) below a specified size has also been prohibited at different times of the year.

As stated earlier, the Act does not define “conservation”. It has no provision relating ownership or management of fisheries and their physical possession. Also there is no mention of management of fisheries through community participation or through the actual fishermen’s community or NGOs. There is no definition of “fishermen” in any legal or policy documents of Bangladesh. This Act fails to recognize the concept of “fish sanctuary” as a conservation approach.

The National Fish Policy, 1998 calls for production based management of open water fisheries as opposed to leasing. The Policy commits to promote involvement of poor and traditional fisherfolk in the management and conservation of both open and closed water bodies although it does not mention community based management as an approach. As a conservation mode, the Policy explicitly recognizes the concept of sanctuary. The other management concerns for fisheries as identified in the policy remain use of harmful devices, pesticides, pollutions from both point and non-point sources, unregulated and over fishing and so on. All these management concerns are claimed to have been successfully addressed by community groups working in the various CBFM water bodies. The Policy commitment for alternative income generation for the fisherfolk to reduce pressure on fishery has also to some extent been addressed under CBFM.

## LEGAL STATUS OF CBFM: LESSONS LEARNT

As a model of participatory fisheries management, the CBFM implemented in two phases (1996-2001 and 2001-2006) had the overall objective to sustainably improve the livelihoods of poor people dependent on aquatic resources.

The CBFM model is recognized by the Ministry of Land, Ministry of Fisheries and Livestock and is implemented with overall guidance and supervision of the Department of Fisheries. The total number of water bodies managed in the CBFM model counts to 117 including both open and closed water fisheries. The CBFM has managed to develop many fish sanctuaries.

The basic two legal documents on which CBFM is premised include the Memorandum of Understanding (MoU) signed between the Ministry of Land and Ministry of Fisheries

and Livestock and also the MoUs signed between the Department of Fisheries, the WorldFish Center (previously ICLARM) and the partner NGOs.

These agreements required the Ministry of Land to hand over the designated water bodies to Ministry of Fisheries and Livestock (MoFL) for managing the same through NGOs in the community based management model for ten years beginning in 2001. The CBFM arrangements that the NGOs followed involved the participation of concerned Deputy Commissioners, District Fisheries Officer, Upazila Fisheries Officer - all having their statutory responsibility regarding management of fisheries. The NGOs, with support and guidance from the local authorities, formed various community management committees with representation of local poor fishermen and drew up management plans for specific water bodies. Most of the community management groups are registered as cooperatives either under the Cooperatives Societies Act, 2001 or the Voluntary Social Welfare (Registration and Control) Ordinance, 1961.

Although the official arrangement with the MoFL, the WorldFish Center and the NGOs come to an end in 2007, these community groups shall continue managing the water bodies in the CBFM model for another five years, i.e., up to 2011. As such, the sanctuaries managed as part of the CBFM approach are expected to be managed until 2011 although no explicit legal recognition exists for this.

During the implementation phase, various CBFM components faced the following challenges requiring legal interventions:

- Unclear demarcation of water bodies
- Cancellation of CBFM lease arrangements by local administration
- Delayed handing over of possession of water bodies due to suits filed by previous lessees
- No access to a few CBFM water bodies due to pending cases
- Pollution
- Demands by persons claiming to have competing rights as riparian fishermen over CBFM water bodies
- Legality of leasing out open water bodies under CBFM
- Legal status of MoUs signed between two ministries as opposed to regular lease agreements executed in the name of the President
- Absence of executive order (gazette notification) giving legality to the CBFM agreements
- Payment of taxes to the government
- Sub-lease of CBFM water bodies by community management groups
- Criminal cases

At the concluding stage of CBFM, the following issues may create legal challenges for the community groups expected to manage the water bodies without institutional presence of the NGOs:

- lack of legal recognition of management models like CBFM (challenges from vested interest quarters)
- lack of institutional support from public agencies
- lack of coordination between statutory agencies
- administrative hierarchy amongst public agencies
- absence of legal recognition of the CBFM management plans
- absence of legal recognition of fish sanctuary
- unclear legal status of community groups yet to register under law
- inadequate fund/alternative income generation facilities
- high lease value
- conflicting claims of vested interest corners over water bodies, fish resources
- absence of provision for continuous legal support
- pollution
- criminal offences

## C. Recommendations

Initiatives like CBFM require the following legal/policy interventions to ensure sustainability:

- Appropriate legal and institutional arrangement to translate into reality policy commitment for upliftment of poor fishermen and their involvement in management of fisheries
- Well defined management laws/rules for public water bodies to include and recognize concepts like CBFM
- Long term commitment to management practices like CBFM
- Avoidance of frequent changes of policies relating fisheries management through leasing (checking vested interests as opposed to the interests of poor fishermen whom programs like CBFM targets)
- Appropriate legal framework to institutionalize the successes and practices of concepts like CBFM
- Clearer definition of traditional fishermen and their right to access to water bodies and decision making process
- Realistic payment requirement (lease value and other legal requirements including taxation) for the traditional fishermen
- Capacity building of the participating fisher folk and community support
- Legal recognition of sanctuary and other sustainable fishing practices introduced through innovative programs like CBFM
- Mandatory and well defined management plans to arrest loss of fishery and other aquatic resources with clear monitoring mechanism (in case of commercial leasing out)
- Avoidance of conflicts in management priorities of different government offices
- Clear and strengthened role and jurisdiction of the MoFL, Department of Fisheries in dealing with water bodies designated for CBFM and alike projects
- Implementation of laws on pollution and conservation of fisheries



## RELEVANT LAWS, RULES, POLICIES AND CONVENTIONS

### **Laws**

The Constitution of the People's Republic of Bangladesh  
Bangladesh Fisheries Development Corporation Act, 1973  
Bangladesh Water and Power Development Board Order, 1972  
Bengal Tenancy Act, 1885  
Environment Court Act, 2000  
The Acquisition of Waste Land Act, 1950  
The Agricultural Pest Ordinance, 1962  
The Agricultural Pesticides Ordinance, 1971  
The Agriculture and Sanitary Improvement Act, 1920  
The Canals Act, 1864  
The Chittagong Port Authority Ordinance, 1976  
The Coast Guard Act, 1994  
The Culturable Waste Land (Utilization) Ordinance, 1959  
The Dhaka City Corporation Ordinance, 1983  
The Embankment and Drainage Act, 1952  
The Environment Conservation Act, 1995  
The Factories Act, 1965  
The Fish and Fish Products (Inspection and Quality Control) Ordinance, 1983  
The Fisheries Research Institute Ordinance, 1984  
The Forest Act, 1927  
The Government Fisheries (Protection) Ordinance, 1959  
The Inland Shipping Ordinance, 1976  
The Inland Water Transport Authority Ordinance, 1958  
The Irrigation Act, 1876  
The Land Reform Board Act, 1989  
The Land Reforms Ordinance, 1984  
The Local Government (Union Parishads) Ordinance, 1983  
The Marine Fisheries Ordinance, 1983  
The Mongla Port Authority Ordinance, 1976  
The Non-Agricultural Tenancy Act, 1947  
The Open Space Protection Act, 2000  
The Paurashava Ordinance, 1977  
The Penal Code, 1860  
The Private Fisheries Protection Act, 1889  
The Protection and Conservation of Fish Act, 1950  
The Shrimp Cultivation Taxation Act, 1992  
The State Acquisition and Tenancy Act, 1950  
The Tanks Improvement Act, 1939  
The Territorial Water and Maritime Zones Act, 1974  
The Water Supply and Sewerage Authority Act, 1996

### **Rules**

Environmental Conservation Rules, 1977

Marine Fisheries Rules, 1983  
Permanent Settlement Regulation, 1793  
Territorial Water and Maritime Zones Rules, 1977  
The Fish and Fish Products (Inspection and Quality Control) Rules, 1997  
The Protection and Conservation of Fish Rules, 1985  
The Shrimp Cultivation Taxation Rules, 1993

### **Policies**

Environment Policy, 1992  
Export Policy, 1997-2002  
Fifth Five Year Plan, 1997-2002  
Industrial Policy, 1991  
Land Management Manual, 1990  
Land Use Policy, 2001  
National Environment Management Action Plan, 1995  
National Fish Policy, 1998  
New Agricultural Extension Policy, 1996  
Water Policy, 1999  
Public Water Body Management Policy, 2005  
And various circulars

### **Conventions**

Convention for the Prevention of Pollution of the Sea by Oil  
Convention on the Law of the Sea  
The Convention on Biological Diversity, 1992  
The Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971

Conference Paper 06



## Cluster based management approaches for wetlands: CNRS's Experience in CBFM-2 project

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## ABSTRACT

Among the reasons for the loss and declining productivity of Bangladesh wetlands is a lack of understanding of the underlying causes of wetland resource depletion. Other constraints to sustainable management include a need for building consensus among stakeholders and their inability to take up appropriate measures. Of late, it has been recognized that local resource users, managers and controllers can play key roles in wetland management. Efforts have been made to involve local user communities in wetland and fisheries management in various capacities since the mid-nineties. Different organizations and projects adopted different modes of community participation in project planning and implementation. This paper describes cluster-based management systems, formation processes, legal status, scope of works, and community responses to the approaches in five sites managed by CNRS under the Community based Fisheries Management (Phase 2) project (CBFM-2). The paper presents some key achievements of cluster/apex based approaches relevant to wider area issues such as restricting harmful fishing practices, reclaiming khas lands from illegal occupation, fish friendly operation of sluice gates, basin-wide integrated management, stopping the sale of banned gears, conflict resolution in upstream-down stream areas, which may have been impossible for single water body-based CBOs. A cluster approach also encourages individual CBOs managing their respective water bodies within the wider area through periodic sharing of lessons, assisting each other's needs and realizing services from local agencies which will have contributed towards developing capacity and sustainability beyond the project period.

## INTRODUCTION

The Community Based Fisheries Management Project, phase-2 (CBFM-2) is being implemented by the Department of Fisheries (DoF), Government of Bangladesh with financial assistance from DFID. This project is being implemented in partnership with the WorldFish Center and a range of partner NGOs, including CNRS (Center for Natural Resource Studies), in a number of water-bodies of different types located in a variety of ecosystems in Bangladesh.

The overall objective of the project is to improve and make sustainable the livelihoods of poor people dependent on aquatic resources, especially on fish. This requires a defined mechanism for the management of water-bodies, that would help to enhance fish production, species diversity, establish access rights for poor fishers to the water-bodies, and equitable distribution. As the project has targeted open-water fishery resources, which are dynamic in nature, enhancement of fish production and protection of species diversity is difficult without biological management of open-water areas covering interconnected water-bodies in wider areas. Ecological management requires a coordinated effort, involving all stakeholders having a stake in the resource system, to ensure project implementation in a basin or watershed. A basin may have numbers of water-bodies transected by tributaries and canals all of which need to be brought under an integrated and coordinated management approach. The project aims to benefit all possible project beneficiaries, however, it is difficult to involve all stakeholders in management at the water-body level. CNRS has emphasized and ensured multi-

stakeholder involvement in open-water fishery management through adopting a cluster management approach where wider watershed communities get involved in management at different hierarchies based on local social and ecological contexts.

## SITE DESCRIPTIONS

CNRS is implementing the project in five sites covering a wide range of habitat types in different ecological settings of the country. Unlike other partners dealing with single wetland management, CNRS brought wider wetland areas under management covering all forms of seasonally interconnected habitat types in each site. The concept of bringing wider interconnected floodplain habitats under management as a unit, is because the sustainability of floodplain fisheries production and biodiversity is not independent on single water bodies. Rather, the ecosystem is heavily dependent on wider areas where different forms of wetlands provide adequate habitats for fish to perform their various biological functions (breeding, feeding), to get shelter while over-wintering and to migrate between habitats.

Of the five sites, two were located at haor<sup>1</sup> basins (Halir Haor, Surma River basin, Jamalgonj upazila, Sunamgonj district and Hakaluki Haor, Kushiayra basin, Borolekha upazila, Moulvibazar district), two sites were in the north central floodplains (Jamuna River Basin, Kalihati upazila, Tangail and Brahmaputra River basin, Pakundia upazila, Kishoregonj district) and the fifth site is located in the south-western floodplains in Magura Sadar, Salikha and Narail Sadar upazilas, Magura and Narail districts.

Each site covers a number of water bodies of different habitat types including beels, khals, rivers and seasonally inundated flooded land (floodplains). Water bodies in haor sites included perennial beels where fishing peaked in the dry season when floodwater was receding. The north central floodplain sites cover a number of seasonal and perennial water bodies where fishing peaked in the post-monsoon draw-down. The river section in Magura-Narail site covers a combination of rivers, beels and khals and each has different fishing priorities depending on water flow regimes and fish movements.

### **Magura-Narail**

The CBFM-2 project has been implemented in river sections and Beels in the Magura/Narail site. This includes the Fatki River which consists of 15 sections (30 km long) of khas water-body (each section is considered as a single water body) located in Magura Sadar and Shalika upazila under Magura district, while the Dhanler and Kumuria beels are privately owned floodplains located in Narail Sadar upazila of Narail district.

### **Pakundia**

This beel area is flooded for around 5 to 6 months of the year. This vast area was previously khas land that has since been transferred into private ownership, and

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<sup>1</sup> A seasonally flooded tectonic depression in the floodplain

most of the wetlands have since been converted into croplands. This floodplain is located in a Flood Control Device/Irrigation (FCD/I) project of the Bangladesh Water Development Board (BWDB) and is linked with the old Brahmaputra River through a canal on which a sluice gate has been constructed. In addition, there are also a number of interconnecting canals that create a network between the beels. A section of local elites have already started carrying out pen-fishing in some of the Beel-Bhora water bodies, which creates additional demand in the floodplain fishery management.

### **Kalihati**

This site consists of 15 water-bodies: one Jalmohal over 20 acres in size<sup>2</sup>, (handed over to the project under a leasing arrangement), 1 large (above 20 acres in size) and 3 small (below 20 acres in size) river sections, and 10 privately owned floodplain beels.

### **Jamalgonj**

This site is located in a haor basin and covers two types of water-bodies, river sections, and beels. Within the project area there are a large number of water-bodies which are not under the project but are important for fishery resources. The haor remains flooded for about 6 to 7 months of the year during the monsoon and becomes a single sheet of water. In the dry season, leaseholders of water bodies catch fish by completely dewatering the water bodies. This site consists of 2 leased Jalmohals of above 20 acres in size, sections of two flowing rivers and 3 small leased beels.

### **Barolekha**

This site includes 2 large Jalmohals over 20 acres in size and five small beels, all of which are leased sites.

## **MANAGEMENT APPROACHES**

### **Co-management of fisheries in wider areas**

CNRS adopted and demonstrated a co-management system to address the issue of managing wider wetland areas in each of the sites within the broader framework of the overall project management approaches of CBFM-2. The approach emphasizes the building of local management structures that would facilitate communities (resource users) and government line agencies (particularly DoF) including the local government bodies (Union Parishads) to take responsibility in management decision-making processes. The approach helps communities to effectively participate in planning, implementing and monitoring fisheries management and community development interventions in a sustainable manner. As the management unit in each site is comparatively large covering numbers of diverse wetland habitats the approach also helps the sharing of common issues among the community groups

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<sup>2</sup> The distinction between small and large water bodies is important because those which are less than 20 acres come under the control of the Ministry of Youth.

and secondary stakeholders in the area both on fish and non-fish issues. Thus, CNRS adopted a cluster-based approach to address the problems in open water fisheries management where the issues of each of the water bodies could be seen in the context of the broader cluster and where boundaries of management units were determined by ecological features rather than administrative limits. It was also key that the water bodies in larger hydrological regimes or defined catchments are interlinked and have upstream and downstream effects, which influence production systems, land-use and livelihoods.

The concept of cluster management emerged from the need to ensure ecological management of the country's open-water fisheries resources. As mobile resources, fish need a wide range of habitats, in accordance with seasonal changes in water regime in the floodplains and rivers, and their biological characteristics. Its multi-stakeholder nature makes open-water systems complex, particularly for management. Different ownership rights and access patterns apply, even within the same watershed or floodplain. Management of floodplains or the open-water environment needs to consider these factors and necessitated a coordinated management approach like cluster management, where all stakeholders are involved to some degree, at different management levels.

#### **A four tier management system**

The wetland environments in which CBFM-2 projects are planned have a variety of hydrological and biological characteristics, and a range of community interactions within them. The management structure has been formulated to optimize the development of individual water-bodies along with the promotion of beneficial interactions among communities residing within common watershed areas.

To accomplish this, a four-tier management structure (Figure 1) has been established under the CNRS-CBFM 2 sites as follows:

**First Tier:** Non-formal at village level - consists of beneficiary groups at village level comprising of mostly poor fishers and other poor households living close to the project wetlands who form the basis for informing management of other committees at the upper hierarchies. The Village Committees, however, have been formed with the representation of all socio-economic / professional classes.

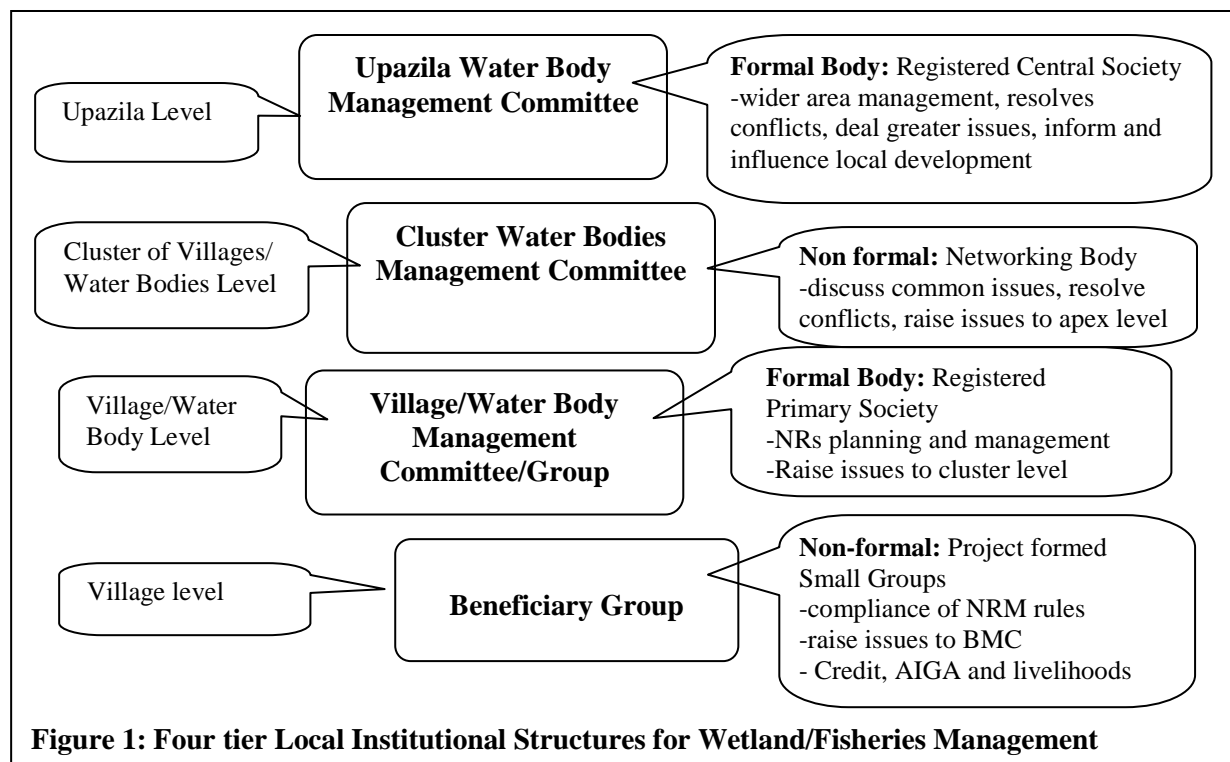
**Second Tier:** Formal at water body level - is the water body level management committee, either Beel Management Committees (BMCs) or river management committees (RMCs). The BMCs/RMC have been registered under the Cooperative Department as primary cooperative societies, or under the Social Services Department as a voluntary organization thus are formal bodies. The Groups and BMCs comprise exclusively of poor members and fishermen for the leased water bodies (jalmohals). However, the BMCs in privately owned floodplains were formed with mixed types of local people. These organizations are directly involved with the management of water bodies.

**Third Tier:** Non-formal networking body at the cluster level - consists of Cluster Committees taking representatives from closely linked/adjacent BMCs or RMCs. The role of this tier is to act as an informal networking body for integrating physical

interventions and for conflict resolution in wider areas. The major responsibilities of such committees are to resolve trans-boundary issues between water bodies, and to facilitate conflict resolution among the fishers, farmers, pump owners, etc. Cluster Committees are formed as informal bodies – there are no plans to have them registered.

Fourth Tier: Formal at Upazila level - consists of the Upazila/Apex Committees taking representatives of all BMCs/RMCs in an Upazila. An Apex Committee has been established in all project sites. The nature of Apex Committee is like the Cluster Committee but in a wider sphere. The major responsibilities of the Apex Committees are to maintain fish migration routes (allowing key fish species such as carp to come into the floodplains), develop linkages between the Water body Management Committees and government and NGO service providers, resolve inter-sectoral conflicts, etc. These Upazila level apex committees are currently being registered as central cooperative societies under the Cooperative Department, or as an apex body registered with the Social Services Department.

The non-formal cluster committees at the third tier or at the cluster level, are however, treated as the formal apex committee where numbers of project water-bodies are fewer, such as in Barolekha and Jamalgonj Upazilas. The second and third tiers of the management bodies have been formed with the representation of group / village committees and sub-cluster / cluster committees respectively. Management bodies at all levels have included active participation by women.



Elected members, chairmen of union council, local elites / professionals, local government officials and NGO representatives are all involved with the process, as members of advisory councils, which are being formed at another level.



## **Rationale for Forming Cluster and Apex Committees**

The CBFM-2 project works with leased water bodies as well as rivers and private floodplains, which are not under the government leasing system. In these wetlands, as well as fishermen, there is access for people involved in other occupations each with their own interests. It is likely that an intervention in a water body influences other water bodies due to the physical links between them. It can be concluded that due to the physical and social contexts that prevail, managing open water fisheries is complex. Therefore, ecological management of water bodies (natural recruitment, conservation of brood stock, protection of year class of fish, dry season refuge, control over use of harmful fishing practices, etc.) with a social focus, demands management of all water bodies in a watershed rather isolated management of a single water body.

Based on the social and physical characteristics, CNRS/CBFM-2 has identified and formed a number of cluster committees to address those issues. Moreover, degradation of water-bodies by natural siltation has been found at most of the water-bodies in each site. Due to resource constraints, desiltation of all the water-bodies and establishment of fish sanctuaries was not possible in all project water-bodies, thus cluster committees selected suitable locations for excavation so that the benefits were derived by the other water bodies in the cluster. It was not possible to build a community centre for all CBOs, thus cluster committees selected suitable venues so that other CBOs could use the centre. The Cluster Committees were formed to achieve following specific objectives under CNRS/CBFM-2 sites:

- To resolve trans-boundary issues between the water-bodies or mouzas.
- To resolve conflict between the CBOs on management issues.
- To facilitate identification of the boundary of the water-body.
- To protect against baath and force fishing.
- To communicate with, and receive assistance from, government / non-government service providing organizations.
- To contribute in empowering poor fishers.
- To develop linkages between the other stakeholders.

## **THE PROCESS OF CLUSTER COMMITTEE FORMATION**

The CNRS/CBFM-2 project has been working at 5 sites with 48 water-bodies in seven different Upazilas under six different districts.

The procedure of forming cluster committees is described below:

At the beginning of the project participatory action plan development (PAPD) and village based general meetings were conducted where the proposal to form a cluster/central committee was raised. In accordance with this decision, the members of all of the executive committees of BMCs met in order to develop a cluster committee and they agreed to the proposal. In that meeting another decision was made that a cluster/central committee (Apex Committee) would be formed by including an adequate number of members from each of those committees. The members of that cluster/central committee would be decided by the respective BMCs

in their monthly meeting. According to that decision, the respective cluster committee elected their representatives for the cluster and central committee (apex body) in their monthly meeting in the presence of the project worker. Then the elected representatives of the respective cluster gathered in a general meeting in the presence of the project worker and formed a full committee in that particular meeting.

CNRS has formed 17 cluster committees at 5 CBFM-2 sites (Table-1). Water-body management committees / CBOs (Community Based Organisations) are considered to be the basis for cluster committee formation. These committees have been formed drawing representatives from each project CBO, where representative of local elites, local government and local administration are involved in playing an advisory role in resource management. A democratic process has carried out selection of CBO members for cluster committees, where all CBO members met and selected members to represent the cluster committees at each site. The responsibilities of each cluster committee was also decided and defined in the committee formation meeting.

Table 1: Distribution of Cluster Committees formed in CNRS/CBFM-2 sites

Site	No. of clusters	Range of water-bodies	Range of members
Magura	5	3	15
Narail	1	3	20
Kalihati	3	4-7	12-15
Pakundia	6	3	15
Hakaluki	1	7	22
Jamalgonj	1	7	10
Total	17	3-7	10-22

### **Magura/Narail site**

Management of a 30km long reach of Fatki River and adjacent floodplains required strong linkage and coordination among sections by management bodies formed under the project. This is because discrete management of one river section will not be effective or applicable in improving fisheries resources and the lives of fishery dependent communities. The project also took into account adjacent floodplains where the prevalence of harmful fishing practices is even greater than in the rivers. Following decisions made in the RSMC (River section Management Committee/CBO) and BMCs (Beel Management Committee), 6 Cluster Committees were formed, representing the interests of people from 17 water bodies. In the river sections, 5 Cluster Committees have been formed that maintain 3 closely located river sections in a cluster.

One Cluster Committee was formed in Narail site, to represent the interests of 3 floodplain beel CBOs, including a water body under the management of Banchte Shekha - one of the other partner NGOs of CBFM-2 working on Sholoar beel located very close to the CNRS-managed Dhanler and Kumuria beels. The justification for the formation of this Cluster Committee in this site was that all three water-bodies

are interlinked and located in the same basin, and as such, intervention in one water-body will definitely affect the others.

Each of the cluster committees in river sections had 15 members. Each of the RSMC (River Section Management Committee) selected 5 persons from their respective RSMC for the cluster committee. A total of 15 RSMCs and 2 BMCs were formed drawing representatives from 87 village committees / fisher groups in the second tier of cluster management whilst village committees / fisher groups are treated as the first tier. A 23-member Apex Committee was formed with representatives of 17 water-body level management committees.

### **Pakundia, Kishoreganj site**

In the Pakundia site, two floodplain beels are under the management of the CNRS/CBFM-2 project, Beel-Bhora and Kahetardia beel. Beel-bhora is a large floodplain system consisting of 63 small beels that are mostly privately owned, except for a few patches of khas land. A total of 19 villages are located in and around the project water-bodies of the Pakundia site, based on access and control patterns. In the first tier, 19 village committees (VCs) have been formed which are being registered as primary societies under the Cooperative Department. Five cluster committees have been formed in the Beel-bhora and one cluster committee has been formed in Kahetardia Beel. Access to, and control over, the water body area in the Beel-bhora cluster was considered when defining the boundaries for clusters, which was decided by a joint meeting of CBOs. Cluster committees have been formed with representatives from the village committees. Each of the cluster committees has 15 members, 5 from each management committee. In the same manner, 4 management committees (VCs) have been formed in the 4 villages around Kahetardia Beel. From this group a cluster committee of 15 members has been formed. Due to the number of villages covered in Beel-bhora, the decision making process was laborious. As a result, 3 villages were considered as a cluster, based on their location, area and surroundings. Finally, a 26 member Apex Committee has been formed at the upazila level comprising of the 6 clusters, and drawing representatives from the cluster committees and CBOs.

### **Kalihati, Tangail site**

There are 15 water bodies, comprising of rivers, floodplains, beels, and Jalmohals in Kalihati site. These water bodies are located in three sub-watersheds that cover around 9 square kilometres area. All the three sub-watersheds are interlinked through a number of canals and rivers.

Three cluster committees have been formed from the 15 water-bodies in the Kalihati project site. A cluster committee has been formed with 4 river sections, and 13 members from the RSMCs (2/3 members from each RSMC). A second, 11-member committee has been formed from 4 beels taking 2-3 members from each BMC, and third has been formed from 7 floodplain beels with 15 members, 2 from each of 6 BMCs and 3 from another BMC. Members of the cluster committees have been selected by their respective BMC/RSMC.

An Apex Committee has been formed consisting of 12 members covering all 15 project water-bodies. One member was selected by each BMC (presently registered as primary cooperative society) from their executive committees to act as a member of the Apex Committee.

### **Jamalganj, Sunamgaj site**

This site consists of 2 leased Jalmohals of above 20 acres in size, sections of two flowing rivers and 3 small leased beels. As the flowing parts of the river are adjacent to each other, one management committee has been formed for both sections. With the adjacent fishermen of the beel area, six management committees have been formed for the beels. Considering the types of water-body, the formation of two cluster committees was planned which are named as beel cluster and river cluster. The beel cluster consists of 5 water bodies (beels) while the river cluster consists of 2 river sections. However, the river sections have not yet been handed over to the project, thus the cluster committee is not yet fully functional. However, the cluster committee formed for management of the five beels has performed as the Apex committee.

### **Barlekha, Moulvibazar site**

Project water bodies are located within the Hakaluki Haor system in Moulvibazar District. It contains 7 water-bodies of different sizes, from which a cluster committee has been formed. Seven BMCs have been formed for management of these 7 beels, however, in Pabijuri and Ramerkuri, two small beels are located very close to each other and registration of these two BMCs has thus been taken as a single primary society. The Cluster Committee was formed with 14 representatives (three persons from each of the large Jalmohal management committees, two persons from each of the 4 small Jalmohals management committees) from these six registered CBOs of the seven water-bodies. It should be noted that this cluster committee is working as the Apex Committee for this site.

## **BENEFITS OF CLUSTER MANAGEMENT**

The perceived vis-a-vis actual benefits are described below. As previously mentioned the function of the cluster committee / apex committee in the project area of CNRS / CBFM-2 was to:

- Identify the management boundary of a project water body
- Prevent the use of harmful gears that are being used in the project water bodies.
- Implement actions that need the joint initiative of more than one CBO.
- Help to carry out habitat restoration and opening fish migration routes.
- Impose management norms (closed season, fish sanctuary, reduction of harmful gear use, etc) that require intervention in a coordinated manner.
- Control the intensity of Katha fishing in water bodies, particularly in river sections
- Play a role in conflict management amongst CBO members and between CBOs.

- Develop linkages between the CBOs and government and development service providers.

During the project period the committees achieved many successes to improve water body management

#### 1. Removing Arbadh (bamboo cross fence across the river/canal)

The hydrological status and characteristics of river sections vary greatly, and accordingly fishing practices also vary. It is impossible, therefore, to take general interventions in these sections. Cluster committees played an important role in making appropriate decisions, which served common interests. There were 164 bamboo made fixed engines (locally called Arbandal) across the Fatki River and adjacent floodplains, which were found to be detrimental to open-water fisheries resources and habitats. All of those Arbandal were removed from the river sections and cluster committees played an important role in this. During the level-2 workshop on 27 July 2003, RSMC members decided to form an Apex Committee with representation from all RSMCs to undertake united action against harmful fishing practices. Installation of arbandal requires considerable investment affordable by the community's elite. Poor fishermen did not have any access to the river sections meaning that they could not catch fish in the rivers. Furthermore, brood stock of fish could not gain access into the beel or canal during the breeding period resulting in low fish production in the river sections as well as in the beels. At the beginning of the project, the beel management committee tried and failed to remove the Arbadh. The elite people of the community were involved with the installation of Arbandal and for this reason poor people could not create enough pressure to remove them. Later, with the help of the Upazila administration, the members of the Cluster Management Committees removed 164 Arbadhs from 15 sections of the Fatki River (2003).

#### 2. Implementing infrastructural activities

A management committee in Beel-Bhora took the decision to re-excavate a canal passing through numbers of small beels in the Beel-Bhora floodplain to establish a link with the Singha River. It had been assumed that this intervention would help fish migration, which in turn would contribute in enhancing fish production. Beel-Bhora has 15 management committees (CBOs) and this canal is to link working areas of 6 committees. However, the canal is a khas land, usually occupied by some local elites. Some persons (Landowners/lords) of the Angiadi and Bababor villages protested before digging, as well as while the work was taking place, in the area of Adittapasha committee of Pakundia site and the management committee failed to resolve the problem. It is notable that the Aditapasha, Angiadi and Bababor villages are adjacent and located in a same cluster. To solve this problem the Cluster Committee sat in a meeting and identified a strategy. With the help of related persons and after discussion with the owners of the land, this problem has been solved and the canal digging has been carried out.

Another incident occurring in the Magura site is that the Kanudar canal is included in two management committees. In 2002 a conflict arose as to who would dig that canal. In that case the related cluster committees decided that the Chukinagar committee would do the work and the work was completed in 2004.

### 3. Removing water hyacinth from Fatki River

Most of the 15 sections of the Fatki River under the management of CNRS/CBFM-2 in Magura, were suffering from congestion with water hyacinth. During the dry season, when the water volume in the river was low, water hyacinth causes pollution (through rotting) resulting in high fish mortality. Several independent efforts to clear the hyacinths took place but did not succeed, as coordinated effort was required, to stop water hyacinth flowing downstream, to cleared areas.

In order to remove the aquatic hyacinth, two cluster committees (6 River Section Management Committees) met in 2003 and the villagers decided to remove the hyacinth on a voluntary basis, and in a coordinated manner. 170 persons (65 persons from Fatki river Kapashati section, 30 persons from Dari Laksmipur section, 25 persons from Bhatoail section, 30 persons from Arpara section, and 20 persons from Khilgati section) from the 5 villages worked for 3 days in order to remove the water hyacinth. In terms of working days, a total of 510 person days were spent on this, equivalent to Tk. 51,000 at 100 taka per person/per day.

### 4. Ecological management

In order to manage natural resources, maintaining a closed season is very important. It is not helpful if different management committees maintain different closed seasons for each of their water-bodies, located in the same watershed. In order to maintain the closed season in a coordinated and effective manner, the cluster committees in a particular site met together and in consultation with the water-body management committees, fixed a common period for all the management bodies to observe closed season. Accordingly, a 2-3 month closed season has been observed in all of the project sites.

### 5. Fish friendly sluice gate management

The Bahadia sluice gate (regulator) is situated in the Bahadia CBO area of Pakundia site. Sluice gate management committees mainly use the sluice gate for draining water from the floodplain in the month of Kartik (October), for planting the winter rice. Moreover, farmers do not allow ingress of water during May-June, the peak season for natural recruitment of fish fry from river to floodplain. Even though the farmers used to transplant winter rice in December, fisheries were not considered at all in the management of the Sluice gate (regulator) because it was controlled by the farmers. CBOs formed by CBFM raised questions over the operation of the sluice gate pointing out that its operation had a major role in enhancing fish production, allowing "white fish" to migrate from the river to the floodplains. The fishers

recommended that water ingress should be allowed in May-June for a limited time period and that water could be drained out one month later. Such practice would contribute towards increasing fish production without hampering winter rice cultivation. The villages adjacent to the sluice gate are Kuratola, Diapara and Mirartake. After forming the cluster committee, the representatives of the adjacent villages discussed it and agreed about the advantages of later draining of the land. These villages are situated in the same cluster and the cluster committee had been given the responsibility to start a dialogue with the Regulator management committee. After a series of meetings, some members of Cluster Committee were included in the sluice management committee.

After this, in the meeting of the sluice gate management committee, the representatives of the clusters gave their opinion about fish friendly operation of regulator, so that benefit would go to the farmers as well as fishermen. Committee members agreed and came to a decision that if the operation of regulator would not hamper winter rice, fish friendly operation could be possible. As of 2004 fish friendly sluice gate operation is ongoing. Under this operation, gates of the regulator have been being opened in May/June for few days (sometimes just for a few hours) to allow river water into the floodplain (if water level of the river rises up to the bed level of the link canal). This allows natural recruitment of carp spawn in the beel.

The Fatki River is a tributary of the Padma River. Upstream, the Fatki River had been permanently closed under a flood control and irrigation project. Presently, the Fatki River feeds off rainwater and back flow from the Chitra River. The Fatki River faces an acute shortage of water during the dry season. Many sections of the river become dry. Due to jute retting, water in many other sections becomes polluted in the late monsoon. There is a link between Fatki River and Nabaganga River through a canal called the Alamkhali Canal (Santai Khal). There is a regulator on the canal at Alam Khali village point. In 2004, the Fatki River was suffering from acute water shortage in September. The Cluster Committee took the decision to allow some water to Fatki River from the Nabaganga River through the Alamkhali Khal. They contacted local BWDB staff and explained the situation, requesting that some water be allowed through to the Fatki River. They also convinced the local UP Chairman to speak for the committee in this regard. Finally, they succeeded in allowing some water to the Fatki River, saving the fish. Seven sections of the Fatki River benefited from the intervention.

#### 6. Donating land for Kanangabazar community centre in the Barlekha site

The project has a provision for establishing CBO community centres. A pre-condition of establishing such a community centre is that the community should donate the land by registering it in favour of the CBO. High land, which is appropriate for building a house, is scarce in haor areas. The CBOs suggested that they would not need a separate community centre if they got one community centre at Kanango Bazar. All the beneficiaries under CNRS/CBFM-2 in the Barlekha site visit Kanango bazar almost every day.

The Cluster/Apex committee took steps to construct a community centre, but as the market (locally known as a “bazar”) is situated in a commercial area, the land price is very high, making it impossible for the beneficiaries to buy or donate land. At least one decimal of land (40 m<sup>2</sup>) is required for a community centre and the land price in Kanango Bazar was approx. Tk. 300,000/decimal. CBFM-2 beneficiary members did not have any land in the Bazar. Landowners in the Bazar were unwilling to donate such valuable land for a community centre. As there was no provision for buying any kind of land, the members of the cluster/apex committee gathered and decided that they would ask for help from the government. Accordingly, they approached to local Upazila Nirbahi Officer (UNO- the chief executive of a sub-district). The UNO agreed to lease out one decimal of land in the Bazar, and later, with the help of the Union Parishad, local elites, and Union administration, the cluster/apex committee made a community centre through leasing of one decimal of khas land.

#### 7. Reducing the size of Kathas and forbidding fishing in the closed season

In order to manage natural resources, maintaining a closed season is very important. It is not helpful if different management committees maintain different closed seasons. Though the management committees of the Vatoail, Darilakshmipur, and Borsoloi of Magura sites had taken a decision that in the closed season, fishing would be forbidden, the owners of the kathas had already arranged to ignore this. At that time, through cluster committees this practice was stopped. Private kathas of different sizes was handed over in different sections of Fatki River in Magura. While reducing the size of these kathas, the kathas of Chukinagar, Kapasati, Arpara sections had increased. As a result, a conflict arose. Later on it was decided that the size of those kathas would be reduced proportionately.

#### 8. Stopping the Bauth fishing in the Poshna beel of Kalihati site

Bauth fishing, a form of fishing festival where many people fish intensively in a particular area, is harmful to wetland habitats and fish resources, but is widely practiced in beel areas. Before starting the project Bauth fishing was practiced in Kalihati site. From surveys, it was found that general people living in and around the beels were engaged in bauth fishing. The organisers would announce that on a specific day, during the dry season, while the water level in a beel was very low, hundreds of people should come with a specific gear called Polo (a type of trap) for Bauth fishing. A single village cannot protect against Bauth fishing by themselves, as the number of Bauth fishers is more than the population of a village. Posna Beel, one of the private floodplain beels under management of CNRS/CBFM-2 in Kalihati, Tangail site was affected by bauth fishing. The organizers made announcements about bauth fishing in local markets. Later on, in a meeting of the cluster committee, the issue of Bauth fishing was discussed and with the help of the Union Parishad, local elites, and the administration, all cluster management committees jointly took initiative, organized villagers, contacted the bauth fishing organizers, and arranged awareness programs through miking (battery operated loud hailer on rickshaw) and performing folk theatre against it and finally stopped the



Bauth fishing. It should be noted that Bauth fishing was also stopped in Magura and Pakundia sites.

#### 9. Stopping gang/force fishing in the Jamalgonj site

Force fishing in haor basins is a common event, and usually happens immediately after water recession into resource-full water-bodies. Mobs in the haor area catch fish in the dry season by force, which is locally known as gang/force fishing. As a result, the fishermen cannot earn as much as they otherwise would and face huge losses and sometimes, cannot pay their leases. In 2003, one project water-body experienced force fishing. Having got information about the group that committed the force fishing, the cluster committee took the initiative to protect against force fishing in the following year. It was found very difficult to take any steps against gang fishers by the management committees individually. Later on, in order to prevent this problem, the members of the cluster/apex committee met and with the help of the Union Parishad, local elites, and the Upazila administration, stopped the gang/force fishing and since then, no gang/force fishing has occurred in the site.

#### 10. Establishing the rights of the Arpara community centre

Arpara management committee, in the Magura site, is situated near the bazar area, where the land price is very high. It was very difficult to find land for the community centre. Later on, the management committee bought 5 decimal of land for the community centre but it transpired that nearby elite had been controlling the land illegally. As a result, it was found to be very difficult to establish the property rights of the management committee. Later on, with the help of the cluster committee, local chairperson, members of the executive committee, and respectable people, rights over this land were established. A community centre was later established on the site in 2005.

#### 11. Steps for stopping harmful net selling

Members of five cluster committees of Fatki River met on 30 August 2004 at the meeting room of Upazila Nirbahi Officer (UNO), Shalikha. The committee took a number of decisions regarding protection and conservation of fisheries resources and implementation of the Fisheries Act at the field level. Though using harmful net is illegal, the traders used to sell such nets in the Market. In the Arpara bazar of Magura site, these net used to be sold openly. In the meeting of the cluster committee, a decision was taken that selling these nets would be stopped, and as such, with the help of the UNO, Upazila Fisheries Officer, and the law-enforcing agency, all harmful net sellers were warned not to sell harmful nets in the future. After the warning on the issue of selling harmful nets, spot checks were carried out. From this, selling of harmful nets was found to have stopped and the Upazila Administration even seized harmful nets from the shops. Through this action, no harmful nets are now being sold openly in the shops of Arpara bazar.

#### 12. Conflict resolution

Recently, a cluster committee has resolved a conflict between a CBO and private landowner in the Borosoloi section of the Fatki River where the landowner was establishing arbandal in Patbhora beel- a privately owned floodplain that is an important fish migration route. The CBO tried several times to prevent the deployment of Arbandal but failed. Finally, the CBO came to cluster committee with the matter. The cluster committee met the arbandal owner and resolved the issue along with the condition of paying of Tk. 1,000 to the CBO fund.

### 13. Conservation measures

Project water bodies in the Pakundia site are private floodplain beels. Harmful fishing practices were found to be one of the main causes for deteriorating fisheries resources in the project site. The declaration of a closed season during the breeding period and the establishment of fish sanctuaries have been accelerated in the site by the cluster committees. As local elites were involved in the cluster committees, it helped to speed up activities that were undertaken by the CBOs. This committee contributed to reducing the use of current and dhora jal and protected against bauth fishing in project water bodies for two consecutive years.

### 14. Other benefits

Cluster Committees managed to extract some benefits from different government agencies in Jamalganj and Barlekha sites. In Jamalganj, the Cluster Committee contacted the Upazila Agriculture office and received training and seeds from the office. In Barlekha, the Cluster Committee managed to extend credit support for CBO members from the Upazila Livestock Office for rearing goats.

The Pakundia Cluster Committee managed to identify some land for establishing fish sanctuaries. Landowners provided the land to the Water-body Management Committee.

Small beels (below 20 acre in size, Jalmahals under leasing arrangement) were not handed over to the project, thus the Cluster committee of Barlekha site approached the Upazila Jalmahal Committee. Finally they managed to obtain a five year lease of the Jalmohals for project CBOs.

The lease value of large Jalmohals in Barlekha site and Jamalganj site were found to be very high. With the help of project staff, the Cluster Committee took initiatives to reduce the lease values. Finally they succeeded in reducing the lease values for Padma beel and Chander beel, Chander Chepti in Barlekha and Goniar beel in Jamalganj.

## CONSTRAINTS TO CLUSTER MANAGEMENT

In the flood plain areas, villages where CBOs are formed are located comparatively far apart, sometimes creating problems in communication between CBO members.

There is no direct benefit to Cluster Committee members, unlike water body management members, thus, to some extent some members are reluctant come to meetings. However, there are members committed to volunteer their time in achieving common benefits.

## KEY SUCCESSES AND LESSONS LEARNT

CNRS has been practicing open-water fisheries management, as a part of watershed management, considering the biological characteristics of the fish, physical linkages among the different types of habitats, seasonal variations, involvement of community people with various interests in multiple-user resources, and sectoral approaches of different government agencies. It is a complex system, which demands the participation of a wide section of stakeholders for management purposes. It has been found that factors affecting a water body's fisheries production have causes far beyond what is occurring in that particular water body. It is beyond the capacity of a village based water body management committee to address issues occurring upstream or downstream but that directly impact the water body. Instead, cluster management of water bodies can address the complexities of open-water fisheries management in an ecological manner (natural recruitment, habitat improvement, facilitating migration route, sustainable harvesting, etc). It needs a comprehensive watershed/basin (or catchments area) management plan. For example, Charan site lies in the Pungli-Sapai river basin, so the total basin should be under single management to have optimum benefit. It should also include uninterrupted linkages with the main connecting river i.e. the Jamuna (Pungli and Sapai are the tributary of Jamuna river). Unfortunately, due to various reasons, CNRS/CBFM-2 could not have the complete basin under its management (all khas Jalmohals were not handed over, resource constraints, etc). However, CNRS/CBFM-2 has been managing the water-bodies at the sub-basin level (48 water-bodies at the 5 sites) and adopting cluster management concepts for management of these water-bodies.

The following are the key lessons of the project those CNRS learnt during the last four years:

- Basin level management (Apex committee in CBFM 2) can facilitate optimal benefit for open-water fisheries management. Usually one or two village(s) can manage a water-body but cannot manage a basin or intermediary. Cluster Committees having representatives from all concerned villages (villages involved in the water-body management) can manage a basin. An intermediary level body (Cluster Committee in CBFM-2) formed with the relevant water-body managing villagers can move quickly to take urgent actions (protection of bauth fishing).
- Floodplains in Bangladesh are having multiple resources involving multiple stakeholders (professional and subsistence fisher, farmer, leaseholder, farm labourers, irrigation pump owners, etc). There are conflicts in using dry season water for irrigation purposes (affecting fish dry season refuge), operation of regulators for saving the crops (hampering fish migration) and many others. All these issues should be taken into consideration for the better management of open-water fisheries resources. Involvement of all such stakeholders is necessary in the management regime. Cluster Committees

are found to be a suitable forum for all stakeholders to become involved in the management regime.

- In addition to the individual water-body level management, Basin level management can ensure natural recruitment of fish spawn in the floodplain beels. Natural recruitment can enhance production of fish and natural recruitment (as opposed to the stocking in the floodplain beel) can ensure access rights for the poor fishers to the open water-bodies. It was experienced that poor fisher community always oppose stocking of fish fry in the floodplain as local elites establish their control over the floodplain beel through stocking.
- Rural people have a clear concept of the present degradation trend of the open-water fisheries, and they have the knowledge of how to protect it. At the individual level, most of the community people are in favour of protecting open-water fisheries but they lack leadership, which can organize common people against the detrimental activities. Cluster management can open such avenue for the rural people in this regard.
- Cluster Committees (both Apex and Cluster Committee) can act as a networking body for the individual water-body management committee. It can empower the poor fishers to exercise their rights. Different government agency and union parishad recognize them and extend their cooperation.

Overall, it can be said that in order to manage and preserve natural fisheries, using cluster management is essential for social, biological, and political reasons, as it includes people from all sectors. In order to manage people's resources, people's participation as well as cluster management is very important.

## SUSTAINABILITY

The CBOs managing individual water-bodies of their own within wider geographical areas or larger watersheds (cluster of water-bodies) are the formal local institutions and are key in the success of community-based fisheries management. The idea of cluster committees emerged from the need of the CBOs and is exclusively for the CBOs to share and help resolve issues among them. On the top of this the Apex Committee which is upazila based and more formal is usually attended by CBOs, DoF and other project partners.

After only four years of field operation since the formation of CBOs, it is difficult to be certain about the sustainability of CBFM at some of the sites. However, there are some lessons that have been learnt:

- Individual water-based CBOs are functioning well in terms of their organizational functions, fisheries management and maintaining linkages;
- Apart from the 10 CBOs who received a grant of Tk. 50,000 to operate micro-credit, now over 40 CBOs (out of 62) are operating micro-credit with their own funds thus the CBOs remain busy with collective activities, beyond simply fisheries management issues;

- CBOs received letters from the district authority for paying lease for the wetlands and they have paid accordingly thus CBOs have direct linkages with the leasing authority which should help them to resolve policy related issues in future;
- Even after CBOs have been phased out from the project, UFOs continue to be invited to attend some of the CBOs monthly meetings, to help them resolve issues;
- CBOs are contacting different agencies to get support for expanding their micro-credit operations. For example, Charan Samity contacted BRDB, a Bank, BRAC and CNRS to get support and got some hope from the bank – indicating that the CBO had earned sufficient credibility for the bank to decide to support them.
- In two sites (Kalihati and Pakundia) all the CBOs are registered under a central society by the cooperative department – through this the apex committee got government recognition and the CBOs are now entitled to get all sorts of help as a cooperative.

Conference Paper 07

A green horizontal band with silhouettes of people and a heart. The silhouettes are in a darker shade of green, and the heart is a lighter shade. The background of the band is a medium green color.

## Empowerment of Women through Fisheries and Aquaculture

Angela Gomes\*

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## ABSTRACT

Banchte Shekha is an NGO based in Jessore, south-west Bangladesh that has supported the development and empowerment of poor people, particularly women. In the CBFM-2 project they found it was possible to involve women in fisheries activities, despite initial opposition from conservative groups. Banchte Shekha was responsible for organizing 7 CBOs in CBFM-2 following their successful experiences with a single CBO in the first phase of the project.

## INTRODUCTION

Banchte Shekha (BS) is one of the largest women and children development organization in Bangladesh, established in 1976 based in Jessore in the southeast region of Bangladesh working to improve the socio-economic status of women and children through poverty alleviation and empowerment programs.

In Bangladesh, various beliefs and practices continue to prevent the usage of full potential of women for the benefit of the society. Banchte Shekha, an NGO totally committed to empower women and bring gender equity, was established to assist in changing this scenario. With the support of the WorldFish Center, DoF and other institutions, it seeks to remove existing beliefs and practices that hinder progress. Sustained efforts are yielding results in changing some of the ill practices, resulting in progress in various spheres. In this paper, an attempt is made to document the genesis of Banchte Shekha, to describe its general activities, and to concentrate on its contribution to empowering women through fisheries and aquaculture.

## BANCHE SHEKHA AND CBFM

Banchte Shekha started working under the CBFM Project in villages around Goakhola-Hatiara Beel in 1987 following a severe flood. Finding that there were many poor people and especially poor women who were interested to benefit from its activities, the area was brought under Banchte Shekha's normal programme to improve the lives of destitute women. After successful completion of the first phase, Banchte Shekha became involved with the second phase and has been working with 7 beels and 1 river section since September 2001. These water bodies are situated in two Districts namely Jessore and Narail. Banchte Shekha is implementing two types of approaches under the CBFM project, Community managed fisheries and Women managed fisheries to make a comparative study.

Banchte Shekha recognizes the urgent necessity of providing skill to women to gain economic freedom, which is essential to bring gender equity in society. As well as providing skills training, Banchte Shekha has helped to bring awareness

to the women to exercise their duties and rights which should help to change the existing ill practices.

Beneficiaries have a great opportunity through the project to sit together with the NGO representatives, Papilla Fishery Officer and Union Parishad Chairman where they can raise their problems, obstacles, demands, and discuss probable solutions. Through the project they have now been enabled to exchange views with them.

Banchte Shekha started the process by arranging meetings and workshops to discuss overall project objectives with the beneficiaries and then formed participatory management committees. Responsibilities were distributed according to their capability. They have a great opportunity for planning and implementing directly. Now women are skilled enough to carry out the project activities.

A number of income generating activities that are appropriate to women are tailoring, embroidery, vegetable cultivation, fish culture, etc. and have been implemented successfully of several years. Although, some of these are traditionally recognized as activities where men are not usually involved and could be carried out without much difficulty, fisheries and aquaculture being new and normally male dominated activities were more difficult and resulted in the stiff opposition from society.

Women of the community were only housewives before intervention of the project, were fully dependent on their husband's income and made no contribution to their family's maintenance. There was no opportunity to go out from their residence for working as day labourers or in the own cultivable lands. A great change has come among women in associated with the project.

While technology demonstration did not prove too difficult for the women, the stiff opposition by the male and female members of the society at a number of stages could only be overcome through determination to resolve various social problems.

Most of the women could not sign and write before the intervention of the project. But they can now sign and write since they became associated with project groups. They realized that their children need to be educated and so that they are sending their children to the schools. There is a great change observed in behaviour, attitude, and health and clothing also.

The impact of fisheries and aquaculture in bringing gender equity has been very high. Most importantly, the visible economic benefits women were able to derive from various activities has gained them suitable place in the decision making process. Based on the experience of Banchte Shekha in introducing fisheries and aquaculture in the most conservative areas of Bangladesh, it is suggested



that similar activities should be considered favourably in the other parts of the world. Educational programmes on fisheries and aquaculture should employ examples of this nature to enlighten people on the potential of this activity and strategies that need to be adopted when there are social constraints.

As a result of sustained efforts over several years, today there are several groups of women involved in fisheries and aquaculture activities who derive excellent economic and nutritional benefits from these new activities.

Conference Paper 08

A green horizontal band with silhouettes of people and a heart. The silhouettes are in a darker shade of green, and the heart is a lighter shade. The background of the band is a medium green color.

## Experiences in wetland co-management – the MACH Project

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## ABSTRACT

Since 1998 the Management of Aquatic Ecosystems through Community Husbandry (MACH) project has established what is best described as community based co-management of three large wetland systems covering in total about 32,000 ha (about 4,600 ha of water in the dry season). The project is supported by USAID and the Government of Bangladesh and implemented by Winrock International, CNRS, Caritas and BCAS working closely with Department of Fisheries and Ministry of Fisheries and Livestock. The key elements of the MACH approach have been establishing community organizations and then embedding within them institutions for sustainable wise use of wetland resources, formally linking these with the existing local government system, and through this making interventions to restore wetland productivity and improve the livelihoods of the poor. The organizations involved comprise: 16 Resource Management Organizations representing all local people with interests in wetlands and fisheries, 13 Federations of Resource User Groups comprising of poor fishers and other poor wetland users, 25 Union Parishads, and the administrations of 5 Upazilas. Co-management is formalized through Upazila Fisheries Committees where representatives of all bodies sit to coordinate and oversee management of the systems.

The results of these organizations observing closed seasons, excavating about 46 ha of beels and 30 km of canals to expand dry season water holding, establishing 56 sanctuaries of 173 ha area and planting 605,000 trees include increases in fish catches of 2-5 times over 1999 baselines of 58-171kg/ha, reaching 316-388 kg/ha across the whole wetland systems in 2004-05, and increases in fish consumption of 45% over the same period which benefit the landless as much as large landowners. Revolving loan funds worth US\$ 0.42 million (Tk.29.10 million) have been transferred to community organizations along with training and have helped about 5,200 poor households increase their supplemental incomes by about 50% while also reducing their dependence on fishing by about two-thirds. For sustainability the Upazila Fisheries Committees are being endowed with a total of US\$ 0.53 million (Tk 36 million), the interest from which will primarily be used for continued restoration of wetland habitat by the Resource Management Organizations. A catchment and wetland ecosystem approach has been vital – for example tree planting and the promotion of contour cultivation on hills have aimed at reducing soil erosion and siltation of wetlands. Ability to address threats has been enhanced, for example in Kaliakoir the number of textile related industries increased from 20 in 2003 to 166 in late 2005 and surface water is now far below national standards in the dry season. The communities now have their own water quality monitoring program and the Upazila Fisheries Committee and Department of Environment have agreed to sign an agreement to cooperate to enforce existing anti-pollution laws as a priority.

MACH has also supported the Department of Fisheries (DoF) to take up similar activities in some of the Fourth Fisheries Project sites, and to assist the new inland capture fisheries team of the department. The MACH approach has already been taken up at the policy level. The Inland Capture Fisheries Strategy of the DoF incorporates as a key element establishing Upazila Fisheries Committees nationally to incorporate and work with an expanding network of community based organizations, and also places the spread of permanent sanctuaries and efforts to restore and sustain major wetlands as high priorities.

## INTRODUCTION

In Bangladesh about four million hectares of land are inundated every year in the monsoon (rainy) season, and over half the country is under water in an exceptional flood year (Ali 1997). In the dry season, the wetlands reduce in size to form a system of rivers, beels (depressions and lakes that hold water permanently or seasonally), and baors (oxbow lakes).

The floodplains of Bangladesh are one of the world's most important wetlands and home to hundreds of species of fish, plants, birds and other wildlife. The wetlands provide the habitat for over 260 fish species (Rahman, 1989) and hundreds of thousands of migrating birds (BirdLife International 2004), and are an important source of income and nutrition for millions of households in rural Bangladesh, particularly the poor. As many as 80% of rural households catch fish for food or to sell (FAP 16, 1995) and about 60% of animal protein consumption comes from fish (BBS, 1999). In addition, poor and marginal households catch many small fish that are not included in official statistics or policies, and use aquatic plants and animals for food or as feed for livestock.

Unfortunately, the wetland resources of Bangladesh are in decline due to over fishing and loss of habitat and connectivity. Wetlands in the past were thought to be "wastelands" in Bangladesh and the Government's goal was to drain out and "recover" them for agriculture production (albeit for one crop a year during the dry season). Even in areas that have not been converted to agriculture, wetland ecosystems have been threatened by other pressures:

- Flood embankments and water control structures have blocked many fish migration routes.
- Irrigation has expanded winter rice cultivation but reduced the surface water that aquatic life needs to survive in the six-month dry season.
- The government leases out fishing rights in public water bodies, but short-term leases have encouraged maximum exploitation without giving incentives to protect resources for the next generation.
- Industrial development causes severe local pollution that kills breeding fish populations during the dry season, residual pesticides and agro-chemicals also adversely affect wetland habitat.
- Deforestation and poor land management cause high rates of siltation, often filling in dry season wetlands that serve as fish holding habitat during a crucial time of the year.
- More and more people fish destructively by dewatering or using fine mesh nets.

The decline in wetlands has resulted in more than 40% of freshwater fish species being classed as threatened with national extinction (IUCN Bangladesh 2000). Since 1985, natural carp spawn catches have declined by 75% (Ali 1997) and major carp and large catfish have declined by 50% in national catches. Fish consumption fell by 11% between 1995 and 2000 (but by 38% for the poorest households), and it is estimated that inland capture fisheries catches had fallen by 38% between 1995 and

2002 (Muir 2003). Despite recent changes in national policies that call for an end on drainage of remaining wetlands (MWR 1999), wetlands continue to be encroached for agriculture, industry, brickfields and aquaculture with no sign of abatement.

The Management of Aquatic Ecosystems through Community Husbandry (MACH) project was formulated to develop new approaches to floodplain and wetland resource conservation and management with the aim of ensuring the sustainable productivity of all wetland resources – water, fish, plants and wildlife– over an entire wetland ecosystem (comprising beels, seasonal wetlands, rivers and streams), not just a single water body and thereby to help ensure food security and increase biodiversity. The MACH project started in October 1998 and is due to be phased out between June 2007 and June 2008. The project is supported by USAID and the Government of Bangladesh and implemented by Winrock International, Centre for Natural Resource Studies (CNRS), Caritas-Bangladesh and Bangladesh Centre for Advanced Studies (BCAS) working closely with Department of Fisheries and Ministry of Fisheries and Livestock.

## MACH SITES

Hail Haor is located in north-east Bangladesh and is typical of deeply flooded basins in that region known as haors. It lies between the Balishara and Barshijura Hills to the east and the Satgaon Hills to the west. Water from these hills flows through 59 streams (once 350 were reportedly active) into the haor. The haor is located in five unions<sup>1</sup> of Srimangal Upazila and in two unions of Sadar Upazila of Moulvi Bazaar District. The watershed of Hail Haor covers about 600 km<sup>2</sup> (237 square miles). Hail Haor was formerly connected by Gopla River and Kamarkhali Khal with the Kushiya and Manu Rivers. A series of flood control dikes along these rivers and a sluice gate restrict river flows and fish access to the haor. The wet season area of Hail Haor is approximately 14,000 ha, whereas the dry season area is typically just over 3,000 ha on an average. Approximately 172,000 people live in 61 villages around the haor.

The Turag-Bangshi site is located just north of Dhaka and is typical of most low-lying floodplains of Bangladesh. The project site covers seven unions of Kaliakor Upazila under Gazipur District and one union of Mirzapur Upazila of Tangail District. The Turag-Bangshi River runs. At the beginning of the rainy season, water spills over the riverbanks through khals (canals) that connect the river to the adjacent beels. Fish move through these canals from the river to the beel/floodplain areas for spawning or nursing, and then later as water recedes after the monsoon the fish move into the deeper perennial portions of the beels or back into the river. Dry season water levels in the local rivers and beels are much reduced from their former levels due to the vast expansion of ground and surface water extraction for boro (dry season) rice irrigation. Fish remain only in the deepest portions of the beels and the river. The 26 beels have a water surface of approximately 10,000 ha at full flood, which diminishes to less than 700 ha at the end of the dry season. The Turag River runs for

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<sup>1</sup> A Union is the lowest administrative level in Bangladesh, typically there may be about 10 unions in a sub-district or Upazila. An elected council or Union Parishad governs each union comprising of representatives from the 10 or so villages within a union.

approximately 30 km through the site and there are another 28 km of canals. Approximately 225,000 people live in 226 villages that make use of the river and floodplains.

The Kangsha-Malijhi site is located in north-central Bangladesh in Sherpur Sadar and Jhenaigathi Upazila of Sherpur District. The area is geographically a part of Garo-Tura Hills watershed and includes the catchments of the upper Kangsha and Malijhi river system. The hills of this area were once covered with natural Sal Shorea robusta forest; now only remnants of natural forest remain. The wetlands and floodplain have a water area of approximately 8,000 ha during the wet season, which diminishes to about 900 ha in the dry season. The floodplain area contains 47 beels or low pockets, of which 18 are perennial. The population of the area is approximately 279,000 in 163 villages. The area is prone to flash floods with water coming from the hills and damaging crops before draining away. Continued flood damage to the monsoon crop has forced farmers to shift to cultivating more dry season boro. The resulting increase in extraction of surface and ground water for irrigation poses a threat to wetlands and the environment in general during the dry season.

## INSTITUTIONAL APPROACH

Like several projects in Bangladesh in the past decade (Thompson et al. 2003; Thompson 2005), MACH has worked to establish community based management systems and has drawn lessons from this. In addition to community organizations for the sustainable use and management of fish and wetland resources, MACH has also worked to improve the livelihoods of poor wetland users and to empower them in decision making. The key differences are:

- The Resource Management Organizations (RMOs) established to protect and sustain wetland resources represent all stakeholders.
- Separate organizations of poor people – Federations of Resource User Groups (FRUGs) – have been formed to help diversify and enhance their livelihoods.
- These community based organizations (CBOs) have been formally linked with local government (both Union Parishads – elected local councils, and Upazila or sub-district administration) through Upazila Fisheries Committees.
- Separate partner NGOs have worked to support each of these types of body and their activities in a collaborative and coordinated way.

### **Resource Management Organizations**

Resource Management Organizations (RMOs) were organized around wetland management areas that contained recognizable dry season water areas or systems (typically identifiable through a local name) but this followed a process of initial understanding, planning, and working in smaller parts of those areas with the communities. The RMO comprises of villagers – fishers, farmers, landless, local elites, men and women – who serve as representatives of the community, chosen from those living in and around the wetland management area and using its resources. The RMO is responsible for the management of the wetland resource

including identifying appropriate management interventions through participatory planning, and implementing them.

The project approach to form local organizations and institutions adopted the following general sequence of steps:

1. Conduct introductory meetings with the Upazila and Union Parishad to introduce MACH and sensitize all levels from officials to villagers about the importance of fisheries and other wetland wildlife and plants.
2. Identify the communities' wetland resource problems and possible solutions including management and physical interventions through the use of participatory approaches.
3. Identify potential management units – these comprise the wetland areas and water bodies and their associated villages and resource users – that are most interlinked and could form a unit to be covered by one local organization.
4. Build rapport and raise awareness in the communities within each management, and post community organizers employed by the project to the sites – one per management unit.
5. Develop the institutions – this was done in a flexible way with important differences in approach between sites. It included working with the representatives from the area who form the general body of the RMO to select from among themselves their Executive Committee and discuss and agree on their constitution.
6. Register RMOs with the Social Welfare Department, thereby giving the RMOs a legal entity and status as local non-government organizations.
7. Develop the capacity of the RMOs and their members, for example how to run the organization, plan activities, supervise implementation, and introduce wetland resource management norms to their areas.
8. Work with the RMOs to enhance representation of the poor and of women by revising RMO membership to ensure a majority of representatives of poorer people dependent on the wetland resources based on 60% of members being representatives of the Resource User Groups (RUGs) formed separately by the project, and associated changes in constitutions to strengthen and protect the interests of poor people.
9. Implement an exit strategy to ensure that the RMOs are sustainable based on: adoption of guidelines on financial and natural resource management, annual review and agreement of resource management plans developed by the RMO in consultation with the wider community and government, and building offices for each RMO.
10. Conduct twice yearly reviews of RMO performance and status to guide capacity building and phasing out.

It was key that the project took a flexible approach in the development of local institutions. The project staff considered the physical characteristics of the wetlands, the settlement of communities around the resource, pre-existing property rights (such as leases) to the wetlands and the social characteristics of the users. This required a high level of capacity in field based staffs that facilitate the process, and places stresses on project management.

The Turag-Bangshi (Kaliakoir) wetlands have a number of lower deeper pockets of water (locally known as kur or kum for rivers and doha for beels). These are the key

hot spots for the fishery since they become isolated water bodies in the dry season and hold the remaining fish stock. The rest of the area is seasonally flooded and comprises private crop land. Separate committees of local people from nearby villages were established to protect certain kums and dohas as sanctuaries, as agreed through participatory planning. Later RMOs were formed covering larger wetlands – the beel or river that is a common flooded area in the monsoon and contains several kums and dohas. All members of these kum and doha committees became general members of the RMO, resulting in relatively large organizations bringing together people each trying to protect their local part of a connected wetland resource system, and with the executive committee of the RMO coordinating and overseeing the activities of the constituent kum and doha committees.

In the fishery of Hail Haor (Srimangal) most of the main dry season water bodies are larger and are jalmohals (state property where the government leases fishing rights to the highest bidder) and are distant from the many user villages that surround the haor. Here the project directly organized stakeholder representatives including local community leaders from those few villages covered by participatory planning into eight RMOs spread around the haor edges. The project then worked to have the leases for some of the jalmohals (one or more in each RMO area) reserved for that RMO without competitive tendering. The RMO then functioned as an enlightened leaseholder sub-contracting fishing to fishers and establishing best wetland management practices in these jalmohals and the neighbouring floodplain.

In Kangsha-Malijhee (Sherpur) area the wetlands comprise of distinct beels that are separate for most of the year. Organization development started by inviting all households in each of the main villages using a given beel system and identified by the project team in its reconnaissance visits to a village meeting, there they formed village committees. These were short lived. Four Participatory Action Plan Development (PAPD) workshops were held one each for two beel complexes and two for the largest wetland area. These formed the basis for the four RMOs that were formed with representatives from the user villages invited to the PAPD and later forming a core group for the respective RMOs.

In total, 16 RMOs have been formed, each covering from 2 to 20 villages, each with populations ranging from 555 to 1,580 households. Based on the choice made by villagers, the members of the general body of RMOs range from 40 to 173 people. The general members selected executive committees ranging in size from 13 to 21. The general body members wanted relatively large executive committees to ensure participation of all villages. Because of the nature of the wetland, under the four RMOs in Turag-Banshi site, there are 20 constituent smaller area based committees (responsible for a deeper pocket within the wetland – a river section or daha), and in Kangsha-Malijhi site there are 18 village committees. At Hail Haor there are no such area based committees within the RMO.

### **Federations of Resource User Groups**

The project recognized from the outset that to restore wetlands and then ensure that they are only used at sustainable levels involves limits on access and use, for example closed seasons and sanctuaries prevent people from fishing as they had done. Moreover the remaining wetlands, even with some excavation, are a finite



resource that cannot provide a decent living for increasing numbers of fishers and a growing population.

To develop alternative livelihood sources for the poor and provide access to micro-credit, small groups were formed, called "Resource User Groups" (RUGs), of 15 -30 men or women from poor households. Generally they own under 0.2 ha of land or less, labour for part of the year, have under 8 years of education, do not belong to any other NGO's groups, and were involved in fishing or collecting other aquatic resources for income or food. Following normal NGO practice for credit and savings programs in Bangladesh, only one person per household could join a RUG, membership is based on making regular personal savings in weekly group meetings. On the basis of savings the members could propose income generating activities for receiving loans. The members also discussed wetland management in their meetings and were trained in business and enterprise skills that they then used after taking loans. Typical enterprises include raising livestock, small shops, and individual skilled work such as tailoring or operating a tree nursery. By late 2006, 5,203 households had members belonging to 250 RUGs. Of the RUG members about 64% are men, about 75% own under 0.2 ha of land.

The MACH approach to livelihood support linked with fishery and wetland management was unique because the RUGs are overlapping but separate from the RMOs. About 60% of the volunteers who belong to the RMOs come from the RUGs and represent the interests of their respective RUGs when they attend the RMO. Similarly wherever there is a RUG in the villages using one of these wetlands it has a representative in the respective RMO.

For the RUG members, the project focused on developing skills and enterprises that would enable participants to reduce their fishing effort or even leave fishing altogether. This included providing vocational training (for example as electricians or drivers) and in some cases providing larger loans of up to Tk 35,000 (US\$ 500). As a result, 153 participants started new skilled jobs or invested in enterprises that provide full time work (for example a power tiller or medium scale broiler chicken farming raising batches of 500 or more chicks).

Activities to benefit the poor were linked to technical interventions such as establishing tree nurseries or trials of alternative crops with lower dry season water demand in an attempt to reduce abstraction from dry season water bodies. However, these initiatives have been scattered and achieving changes in agriculture on a larger scale that is linked up with resource management planning by RMOs for water and land use still has a long way to go.

Federations of RUGs (FRUGs) have been formed roughly coinciding with Union Parishad boundaries (13 in all). These have been registered with the Social Welfare Department. So far the revolving loan funds provided under the project have been transferred to nine of these FRUGs. The FRUGs then have responsibility for managing the savings of their members and credit funds from which they lend to their members. As such they are entirely membership based organizations with elected office bearers from among the members. They already employ staff (paid from part of the interest charged on the loans) to manage the saving and loan

processes, reporting to the executive committee and to the general body of members.

By late 2006 the RUG members had accumulated savings averaging Tk 1,600/member (US\$ 23/member) equivalent to a total of Tk 8.35 million or over US\$ 120,000, and had revolving loan funds of about Tk. 29.10 million (US\$ 427,000). Revolving funds amounting to Tk.16.20 million have been handed over to nine FRUGs, and the remaining amount is due to be handed over to the other FRUGs when they can be registered. For up to one year some FRUGs have been running their micro-credit functions by themselves with limited external supervision and monitoring.

According to a survey undertaken in 2002 the average household income of the RUG participants at that time was about Tk 35,000 (US\$ 540) during the previous year (below the national poverty line of Tk 45,000 (US\$ 690) per household per year). The net profit for borrowers after repaying their loans was Tk 2,150 (US\$ 33) per loan. A sample survey in 2006 indicated that 47% of RUG member households had not earlier fished for an income, but of the 53% that had been professional fishers, 66% had left the profession since joining a RUG and getting support for alternative occupations.

### **Co-management bodies**

Co-management has been a focus of attention in fisheries (and natural resources) management in the last two decades. The IUCN defines co-management as: “*a situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources.*” (Borrini-Feyerabend et al. 2000).

In the case of fisheries it has most often been taken to mean a sharing of responsibility between government and fishing communities. Co-management stretches from government dominated decisions at one end of the range with government instructing users, through consultations, to at the other extreme users advising or informing of their decisions for government endorsement (Berkes 1989; Pomeroy and Williams 1994; Sen and Nielson 1996).

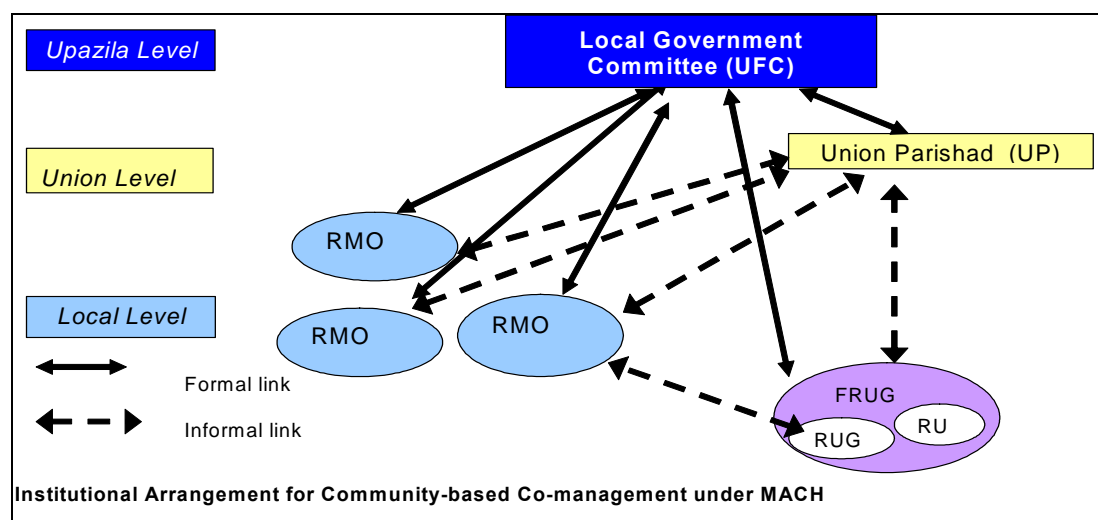
Co-management has been promoted in the belief that a shift from top-down management to sharing decisions and responsibility between resource users and government would improve the quality of decisions and local compliance with management plans. Therefore the intention of co-management is to empower fishers both as an end in itself and in the expectation of better management (Viswanathan et al. 2003). This requires major changes in institutions, organizations and attitudes.

The MACH approach can be termed community-based co-management. It has focused on helping communities organize for improved management of their resources (RMOs) and helped the poor organize to improve their individual livelihoods (FRUGs). But community based management of wetland resources is unlikely to be sustained without recognition from and linkages with other formal institutions, and strong community organizations are needed if wetland users are to

share decision making with government. The MACH project has developed and demonstrated a combination which is new for Bangladesh and has proved very effective. Although the project has been undertaken by NGOs, and has focused on establishing RMOs and FRUGs, they have been formally linked with local government.

By reserving use rights to water bodies for 10 years for community based organizations – RMOs – the government recognizes the right of those RMOs to make and implement management plans and sets of rules just as leaseholders have done in the past. The difference is that with long term rights and considering their community interest, the RMO adopts better practices that sustain and restore fish stocks and wetland biodiversity. In this approach wetland resource management decisions are taken by the RMOs, but these are endorsed, coordinated and overseen by a co-management body. Two tiers of local government are relevant. The Union Parishad is a local elected council typically covering around ten villages, and is the only long standing form of representational local government in Bangladesh. Among its responsibilities is local planning. The Upazila or sub-district is staffed by technical officers of various line agencies as well as administrative officers, and has responsibility for delivering government services.

MACH established Local Government Committees (LGCs) (renamed as Upazila Fisheries Committee - UFC in 2007) in the four main Upazilas where it is working. These comprise of the relevant Upazila officers (chaired by the chief administrative officer – Upazila Nirbahi Officer – and the member-secretary is the Upazila Fisheries Officer), the chairmen of those Union Parishads where wetland management is being improved, and the chairpersons of the community organizations established through MACH – the RMOs and FRUGs. The committees meet quarterly to discuss the problems and potential solutions to wetland degradation, plans for habitat restoration by RMOs are debated and approved, and problems and issues encountered by the community organizations and project have been discussed and solutions found. Originally a mechanism for coordination of project implementation, these have become effective co-management bodies and have been formalised beyond the project end. In addition to this formal co-management body, the RMOs have developed informal links with the Union Parishads in whose areas they work, and are invited to attend the Union Parishad meetings.



## Fig 1. Institutional Arrangements for Community-based Co-Management under MACH

Thus both formally and informally the networking and social capital of the community based organizations have been enhanced through co-management committees playing this supportive role. Local government has a well defined and more substantial role than under the previous system. Figure 1 shows the linkages involved. The LGC/UFC can also refer issues that are outside of its scope to resolve either to the appropriate line agency, such as the District Fisheries Officer, or to the District administration.

To sustain these institutional arrangements beyond the MACH project, MACH has raised awareness within the Government of Bangladesh of the merits of the LGCs as co-management committees. The Department of Fisheries has now proposed that this arrangement be made permanent and extended (eventually to all Upazilas) by establishing Upazila Fisheries Committees with the same composition as the LGC and with both the responsibilities of the MACH LGCs and those of the former Upazila Jalmohal Management Committees (which were concerned only with leasing of some jalmohals). The great merit of this framework is that although it is a uniform prescription, it is for coordination and oversight. Within this framework community based organizations of any and all forms that are effective in improving wetland management and community participation can be supported, just as already the nature of the RMOs under MACH differs between the three sites.

## RESOURCE MANAGEMENT

### Planning and problem analysis

Participatory planning took place in different forms in each site. Initially workshops were used to work with the communities to identify problems and develop potential solutions in Hail Haor and Turag-Bangshi sites. By 2001, in Sherpur the project made use of a more systematic approach, Participatory Action Plan Development (PAPD), that works separately and jointly with stakeholders (see Sultana and Thompson, 2004) and building on earlier methods. The main problems identified in all three sites were siltation and declining fish catches along with losses of other aquatic biodiversity (Table 1). Site specific problems included pollution in Kaliakoir, flooding in Sherpur, and leasing of jalmohals in Srimangal. The physical interventions identified through consensus typically included establishment of sanctuaries, habitat restoration and improvement, and connectivity restoration.

**Table 1 Top seven problems identified by stakeholders in participatory planning**

Problem	Hail Haor	Kaliakoir	Sherpur	Addressed by MACH
Siltation	√	√	√	YES
General decline in fish	√	√	√	YES
Loss/catching of fish spawn and brood fish		√	√	YES

Pollution		√		YES
Use of destructive gear	√	√	√	YES
Leasing system	√			YES
Loss of water birds	√			YES
Decline in aquatic resources plants/ animals	√			YES
Some fish species lost			√	YES
Lack of employment		√		YES
Low water in dry season/ irrigation problem	√			YES
Rice seed (HYV) quality		√		NO
Fish disease			√	NO
Flood damage			√	NO

Based on the outcomes of participatory planning, each RMO developed and agreed upon a set of rules or norms regarding fishing within those areas where it directly controls access or has direct influence<sup>2</sup>. These have been formalized into resource management plans with associated maps and are endorsed by the Upazila Fisheries Officer (UFO). The main access limits introduced by RMOs to ensure sustainable fisheries are:

- aquatic sanctuaries,
- closed seasons of various lengths for all fishing in the early monsoon to protect fish when they are breeding, and,
- bans on fishing gears and activities that have been identified with the local communities to be most harmful to the fishery and wetland – such as dewatering and pumping out of deeper parts of the lakes (beels) and ditches, and use of fine mesh nets that target juvenile fish.

In order to cover costs of water body leases, maintenance of conservation measures and RMO operations, they collect payments for fishing from fishers that just cover these costs.

## Sanctuaries

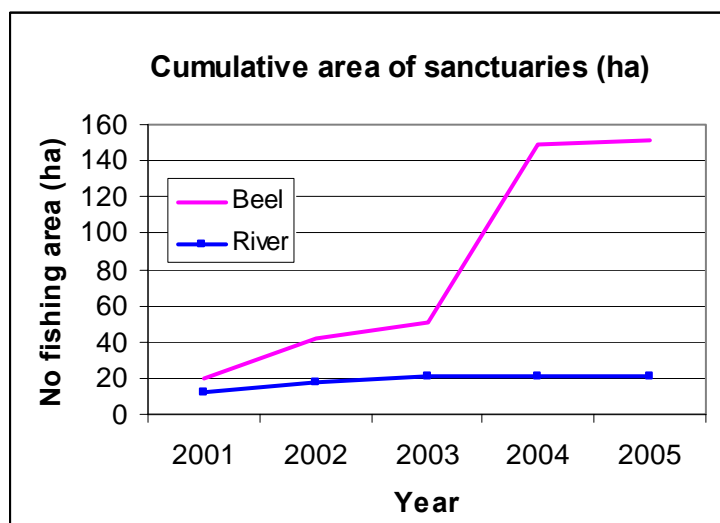
By agreeing to stop fishing year round in areas that retain water in the dry season, the community ensures that adult fish can survive the dry season to breed (and the RMO establishes a general closed season at that time to improve the chances of spawning and juvenile fish). Expected benefits include higher catches in the rest of the wetland system, and restoration of biodiversity including fish, plants, invertebrates and waterbirds. By the end of 2005, MACH had helped RMOs

<sup>2</sup> By 2005 the Ministry of Land had reserved 34 jalmohals for management by the 16 RMOs for 10 years on condition that they pay the government a lease fee each year, a further 8 had been set aside permanently by the government to be sanctuaries protected by the communities. In addition the RMOs influence resource use in private lands that are seasonally flooded which surround these jalmohals, and also in Hail Haor they aim to influence the practices of the leaseholders of other jalmohals.

establish 56 functioning wetland sanctuaries at the three sites covering 427 acres (173 ha) (Figure 2). The sanctuaries are either locally declared or declared by the Ministry of Land.

Locally declared sanctuaries have been set up by RMOs within part of the water bodies (jalmohals) where they hold the fishing rights for 5-10 years. These sanctuaries are part of local management plans and are designed to restore fish catches for the local communities represented by the RMO. Typically they are a small but vital part of the water body that retains water through the dry season and overall cover about 1.9% of the dry season water area of the MACH sites.

A few sanctuaries have been declared directly by the Ministry of Land, after proposals made by the project. These are larger areas of national importance to protect wetland habitat, fish and other aquatic fauna and flora. They have been taken out of the leasing system permanently, and on payment of a nominal fee to government the respective RMO is entrusted by the government to protect the sanctuary. In the Turag River three deeper spots were declared as sanctuaries in this way and function in a similar way to those established just by the RMO. However, in Hail Haor a much larger sanctuary known as “Baikka Beel” that in effect covers a contiguous area of about 100 ha has been established to serve as a wilderness refuge for the whole haor to protect fish, wildlife (water birds) and restore haor wetland habitat.



**Fig.2. Sanctuary areas in rivers and beels under the MACH project**

The project has adapted traditional fish aggregating practices to increase fish populations in sanctuaries. Traditionally local landowners use tree branches to make brush piles in deeper parts of a water body to provide shelter for fish. Algae, plankton and other organisms grow on the surface of these tree branches and become a source of food for fish, and the branches prevent unwanted fishing, then the owner contracts specialist fishing teams to encircle the shelter, remove the branches and catch all the fish. However, tree branches rot and have to be replaced regularly which contributes to loss of tree cover, so in beel sanctuaries the project has installed over 23,000 “hexapods” and pipes made of concrete which will last for many years and serve the purpose of providing shelter, surfaces for growing fish

food and preventing fishing without repeated investments by the RMOs or reducing local tree cover.

### Habitat restoration

Siltation of canals and beels is a major problem that results in a reduction in the volume of water stored in beels. In 1999 it was found that the largest chora (hill stream) feeding Hail Haor carried over 200,000 m<sup>3</sup> of sediment just in July. In 2001, silt loads of 22 choras were monitored – they carried 50,000 tons, suggesting that the total of 59 active choras carry over 100,000 tons of silt into Hail Haor each year. Moreover sediment traps showed deposition of 8-15 cm of silt in one year near the outfalls of the choras, which results in an average estimated raising of the haor bed by about 5 cm per year or 1 m in 20 years (MACH 2004). With only 2-3 m of water in most of the Haor in the monsoon, Hail Haor is changing rapidly, the fringes of the haor are rapidly filling in, and it could disappear as we know it today. This pattern is repeated in the other project sites and throughout the country. The connecting channels or khals between beels and rivers are silting up, and this has a disproportionate impact on the fish populations. Some species of fish breed in the river environment and then juveniles migrate from rivers to beels at the onset of the rains when water levels are rising, later adults return to the river at the end of the monsoon when water levels fall. Blockage of connecting canals by siltation and sluice gates delays or prevents migration of both adult fish and offspring.

To address this adverse trend, wetland habitat has been restored by re-excavating canals to improve flows, and re-excavating beels (mostly within areas declared by the RMOs as sanctuaries) to increase the depth to maintain water year round. The improved habitat provides better shelter for fish, and facilitates breeding and regeneration of aquatic plants and animals.

RMOs and local government formed Project Implementation Committees to oversee contractors and in some cases employ the labourers required for earthworks. Though the total area excavated is modest compared with the total dry season water area (Table 2), these deeper fish refuges and canal connections directly serve and link with the majority of the dry season water area in the three sites.

**Table 2. Re-excavation in MACH Project sites between 1999 and 2005**

Site	Canal length (m)	Beel area (ha)	Area of directly connected water bodies (ha)
Hail Haor	11,200	13.9	211.0
Turag Bangshi	9,500	20.8	144.6
Kangsha Malijhee	9,240	11.1	147.3
Total	29,940	45.9	502.8

Re-excavation of wetlands addresses the outcome of the siltation process but not the root causes. MACH introduced a watershed approach to address water catchment management on a pilot and demonstration basis, this has worked in upland areas that are outside of the wetland and RMO managed areas to address problems identified by the communities. Land use mapping for two chora catchments flowing into Hail Haor revealed that 46% is under tea estates (which are already

reasonably well managed to limit soil erosion), 28% is forest land under the responsibility of the Forest Department (some of which has poor tree cover), and 13% is privately managed pineapple and lemon gardens. The pineapple disproportionately contributed to siltation because the growers habitually grew pineapple in rows running up and down the slope, accelerating soil erosion in this high rainfall area (2,200 mm pa; MACH 2004). Lemons are more typically grown at the base of the hills and not on the steep slopes. By bringing in expertise on pineapple growing and working with a few farmers to test and demonstrate it was found that contour cultivation was not only feasible but resulted in denser planting per ha, reduced fertilizer costs, and generated higher profits (an extra Tk 130,000 (US\$ 2,000) per ha), and of course reduced soil erosion. By the end of 2005, a total of 32 farmers had adopted the contour planting method on 72 plots covering 92 acres (37 ha), and the Department of Agricultural Extension has agreed to promote this method more widely.

Communities felt it was important to plant native trees to mitigate the past trend for loss of tree cover including swamp forest in the wetlands and riparian areas, this is also expected to help reduce the sediment loads in small rivers and channels flowing into the wetlands through bank stabilization. Notably the project has helped to pioneer and demonstrate nursery raising and planting out of native wetland trees - Hijal *Barringtonia aquatangula* and Koroch *Pongamia glabra* – that are adapted to being inundated by a meter or more of water for up to half of the year. This swamp forest is important for providing habitat for growing fish during the monsoon as well as habitat for other wildlife, and helps to shelter villages and provide branches for brush piles. Table 3 summarizes the extent of reforestation through the project. However, out of the trees planted about 293,000 were found to be surviving in late 2006.

**Table 3 Wetland and other reforestation undertaken by MACH up to November 2005.**

Site	Swamp forest (no. trees)	Riparian plantation (no. trees)	Other plantation (no. trees)	Total (no. trees)
Hail Haor	72,105	52,053	59,028	183,186
Turag Bangshi	18,057	59,692	46,304	124,053
Kangsha Malijhee	34,803	121,543	141,780	298,126
Total	124,965	233,288	247,112	605,365

## IMPACTS

### Fish Catches

The management practices adopted by the communities are based on their own problem and solution analysis complemented by specialist biological and engineering expertise, but from the outset (the baseline pre-intervention year of 1999) a rigorous monitoring program was set up to quantify impacts. Fishing catch and effort are recorded at 10-day intervals in 23 fixed monitoring locations covering 1,825 ha and representing the range of wetland habitats present. Within those defined areas separately operating fishing units (which may be one or several



people) were recorded according to the equipment (gear) they used for fishing. For three fishing units of each gear type or 10% of units of that type (whichever was the higher figure) the gear type and characteristics, expected duration of fishing, and catch by number and weight of fish were recorded. The sample area catches are taken to be representative of the whole wetland system and the total catch estimate for the sample areas multiplied up by the fraction of the total area gives an estimate of total catch.

Compared with the baseline years (the first year of records for each site, when there were no management interventions) there have been substantial increases in total fish catch and in catch per hectare in all three sites (Table 4). The greatest gains in catch per area (5 times increase) have been at the Turag-Bangshi site where the fishery was in a very poor condition before restoration. Although effort appears to have increased to a very high level there, catch per person day has also increased. The low levels of catch per person day in both Turag-Bangshi and Kangsha-Malijhee sites reflect the greater importance of subsistence fishing in floodplains in these sites – as this is a supplement to income more people fish for just part of a day or spend days fishing when they have no other work, whereas most of those fishing in Hail Haor do it for their daily income. A complication to interpretation of the trends is that 2004 was a high flood year with greater availability of fish and hence effort increased to take advantage of this bounty. Despite this increase in effort, the catch per person day was higher in 2004 in all three sites than in the baseline year suggesting that the project has resulted in improved fisheries which may be sustained in the future.

Achieving compliance with the fishing norms introduced through the resource management plans has not been easy, and the RMOs have tended to concentrate on water bodies where they hold fishing rights and have had less influence on other areas. Although there is generally relatively little fishing in the months when a closed season was introduced, there is no sign of any overall reduction in effort in that time. However, they do appear to have changed opinions to some extent regarding use of fishing gears and practices identified as particularly harmful. The percentage of effort using such gears has fallen, although total effort with these gears remains substantial. Hence it seems more likely that sanctuaries, excavation of habitat, and the ban on de-watering that RMOs observe may have had the greatest impacts.

**Table 4 Changes in fish catches in relation to wetland management activities in MACH sites.**

Year and site	Maximum area inundated (ha)	Cumulative area of sanctuaries (ha)	Cumulative area excavated (ha)	Total estimated catch (t)	Effort (person days per ha)	CPUE ** (kg/person day)	CPUA *** (kg/ha)	Effort in closed season		Effort with banned gears	
								person days	% of effort	person days	% of effort
Hail Haor											
1999-2000*	NA	0	6.65	2,137	120.8	1.13	171.1	8,896	5	62,853	36
2000-2001	12,214	5.65	10.28	2,561	93.3	1.76	205.0	12,682	9	42,447	31
2001-2002	12,215	8.87	20.30	2,382	89.6	1.71	190.8	15,601	12	40,640	31
2002-2003	14,926	18.11	31.94	3,588	78.1	2.95	287.3	7,979	7	32,592	28
2003-2004	13,490	103.79	70.35	2,021	72.0	1.80	161.8	11,093	11	31,572	30
2004-2005	15,835	103.79	70.37	4,854	138.3	2.25	388.6	21,706	11	57,128	28
Turag Banshi											
1999-2000*	NA	0	0	253	217.3	0.27	57.8	4,290	5	24,917	30
2000-2001	NA	22.34	2.37	546	397.5	0.31	124.7	16,896	11	62,960	41

2001-2002	NA	44.48	4.91	458	491.7	0.21	104.8	37,856	20	31,473	17
2002-2003	NA	44.48	6.12	613	500.4	0.28	140.1	11,855	6	36,797	19
2003-2004	4,297	54.59	34.72	1,379	509.3	0.62	315.2	19,665	10	41,237	21
2004-2005	NA	54.59	39.92	1,403	717.2	0.45	320.7	24,102	9	68,378	25
Kangsha-Malijhee											
2000-2001*	NA	5.69	1.69	1,233	568.6	0.23	150.2	12,838	7	20,416	12
2001-2002	14,926	6.77	9.69	1,225	651.0	0.20	149.2	21,578	11	45,074	23
2002-2003	NA	9.56	21.27	2,244	996.9	0.24	273.4	49,141	16	54,063	18
2003-2004	NA	11.61	46.04	2,591	754.9	0.37	315.6	27,874	12	27,631	12

\* Baseline (no interventions to improve wetland or its management).

\*\* Catch per unit effort

\*\*\* Catch per unit area

Notes: 1. Assumes core closed season is Baishak – Ashar i.e. 17% of the year.

2. Only banned gear considered here is current jal

3. Maximum area inundated is calculated using GIS and a digital elevation model for Hail Haor each year, but has only been estimated once for each of the other two sites.

4. The actual excavated areas are shown and do not include the total area of water bodies within which perennial water areas were created.

## Fish Consumption

It is well known that fish is the main source of dietary animal protein in Bangladesh, but national fish consumption declined between 1995-96 and 2000 by 14% to 11.1 kg/person/year (Muir 2003). To assess direct impacts of improved wetland management on livelihoods, especially those of poorer people, fish consumption was monitored for a panel of 1,050 households from 29 villages. Local women were trained as monitors and visited each sample household once every three days (10 days per month) to sort and weigh the species of fish being prepared for cooking and home consumption.

**Table 5. Fish consumption (g/person/ day)**

Year	Hail Haor	Turag-Bangshi	Kangsha-Malijhee
1999	49	29	Na
2000	52	28	Na
2001	54*	30	24
2002	60**	37**	28*
2003	58**	47**	29*
2004	65**	48**	34**

Notes: 1. Hail Haor and Turag-Bangshi “1999” data are from September-October to April of following year, subsequent years are May to April of next year; Kangsha-Malijhee data covers full calendar years.

2. Figures are averages of each household’s average consumption in the period.

\* = significantly higher than baseline consumption, \*\* significantly higher than both baseline and 1<sup>st</sup> impact year, t-test, p<0.05

In both Hail Haor and Turag-Bangshi fish consumption has gradually increased since the baseline year, and in 2004-05 was respectively 33% and 66% higher than the baseline period (Table 5). These benefits have been shared widely across poor and better off households. Most of the households monitored were landless (about 60%) or marginal farmers (about 20%).

In Hail Haor these were the types of household that have enjoyed significantly higher fish consumption since 2002-03. The other landholding households have not significantly increased fish consumption and since the larger landowners had higher consumption at the baseline this means that the poor have caught up in their consumption. However, this was a more productive fishery even before MACH started its work compared with the other two sites and so fish consumption was much higher than the other sites and the national average.

In Turag-Bangshi all landholding categories had similar levels of fish consumption before the project and all have gained significantly. The timing of increases in fish consumption in the three sites is indicative of a project impact since sanctuaries and excavation only started to be implemented in 2001 so impacts in the next year might be expected.

Households in Kangsha-Malijhee had the lowest fish consumption levels of the three sites initially and this remains the case, but all landholding categories have made similar gains, and even after one year of project activities consumption increased significantly compared with 2-3 years in the other sites. Per capita fish consumption was 33g/day in impact year-3, up from 22 g/day during the baseline period. Per capita fish consumption of landless households increased by 45% and for large farm households by 47%. Similar gains of 46-61% were found for the other landholding classes.

### **Biodiversity**

Fish species diversity was assessed as a simple count of species recorded from the sampling program, which was a constant effort between years in each site. There was at best a modest increase in the number of species recorded between the baseline years and subsequent years (Table 6). The dominant species by weight caught in all three sites included Jat puti *Puntius sophore* which is typical of open waters in Bangladesh. Small shrimps were the highest percentage of catch (10-19%) in baseline and subsequent years in Turag-Bangshi and Kangsha-Malijhee sites. This is a concern, as de Graff et al. (2001) have argued that a high proportion of shrimps in floodplain catches indicates a fishery that has been severely damaged as it lacks appropriate conditions for breeding and recruitment of larger and beel resident fishes.

**Table 6. Fish species diversity (number of species recorded)**

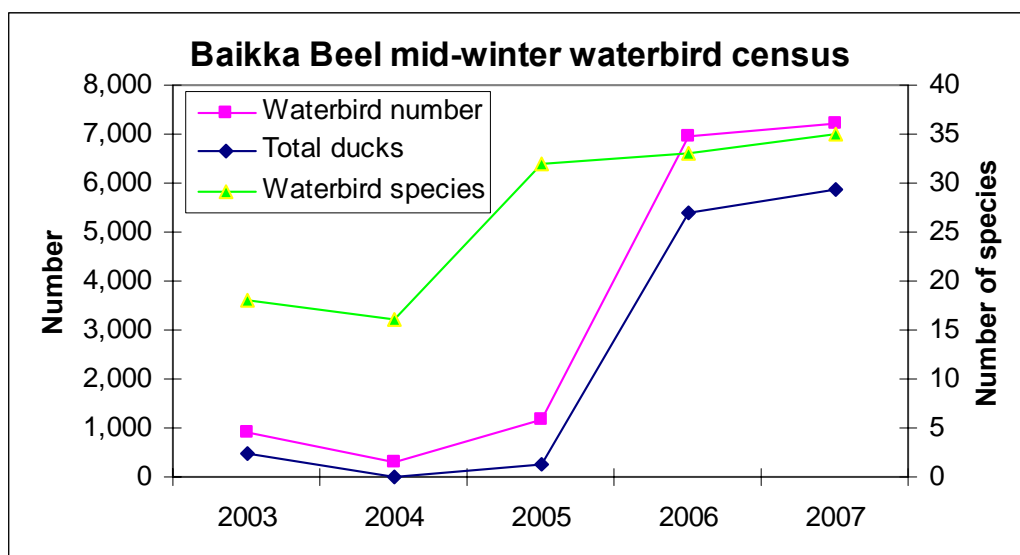
Year	Hail Haor	Turag-Bangshi	Kangsha-Malijhee
1999	71	82	Na
2000	71	81	Na
2001	69	86	64
2002	79	91	67
2003	67	85	71
2004	81	85	73

Years defined as follows: Hail Haor - April to March of next year; Turag-Bangshi - May to April of next year; Kansha-Malijhee - August to July of next year.

In all three sites in the baseline year miscellaneous small fish of a number of species comprised a high proportion of the catch. In the less degraded fisheries (Hail Haor and Kangsha-Malijhee) the recovery has mainly been of other fish such as snakeheads and small catfish able to over winter in the sanctuaries. In Turag-Bangshi while those species groups have recovered, small fishes have also increased substantially in catches.

At the species level, variation in number of species recorded in the surveys reflects observation of some species in one year, but not the other year. However, combining all impact years, in Hail Haor, 96 species have been recorded and species diversity has been maintained or increased during the Project. The pattern is similar in Turag-Bangshi Site where overall 97 species were observed. In Kangsha-Malijhee 88 fish species was recorded in the impact years, a relatively greater gain in species diversity which may reflect initiatives there by RMOs to reintroduce locally rare or lost species as well as conservation measures.

Not only fish have been the focus of wetland management and protection. Tree planting has of course directly restored local plant diversity particularly where swamp forest had been lost. But in Hail Haor in the 100 ha wetland sanctuary of Baikka Beel, since 2004 the RMO has banned fishing, hunting, and collection of aquatic plants, except for limited grazing in part of the area. Since then 111 species of birds have been recorded. Both numbers and diversity have increased, reaching 7,200 birds of 35 water bird species in January 2007 (Figure). These include large flocks of wintering ducks, also six globally threatened and seven near-threatened species have been recorded, including up to six Pallas's Fish Eagle.

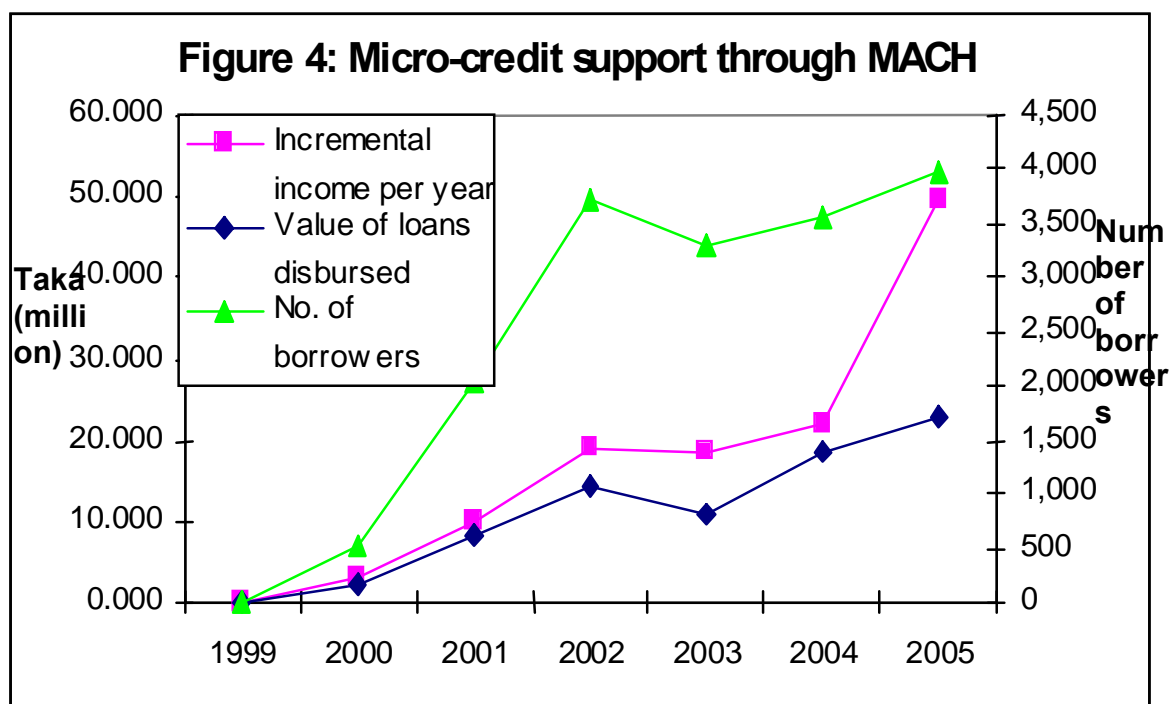


**Fig.3. Bird numbers in Baikka Beel**

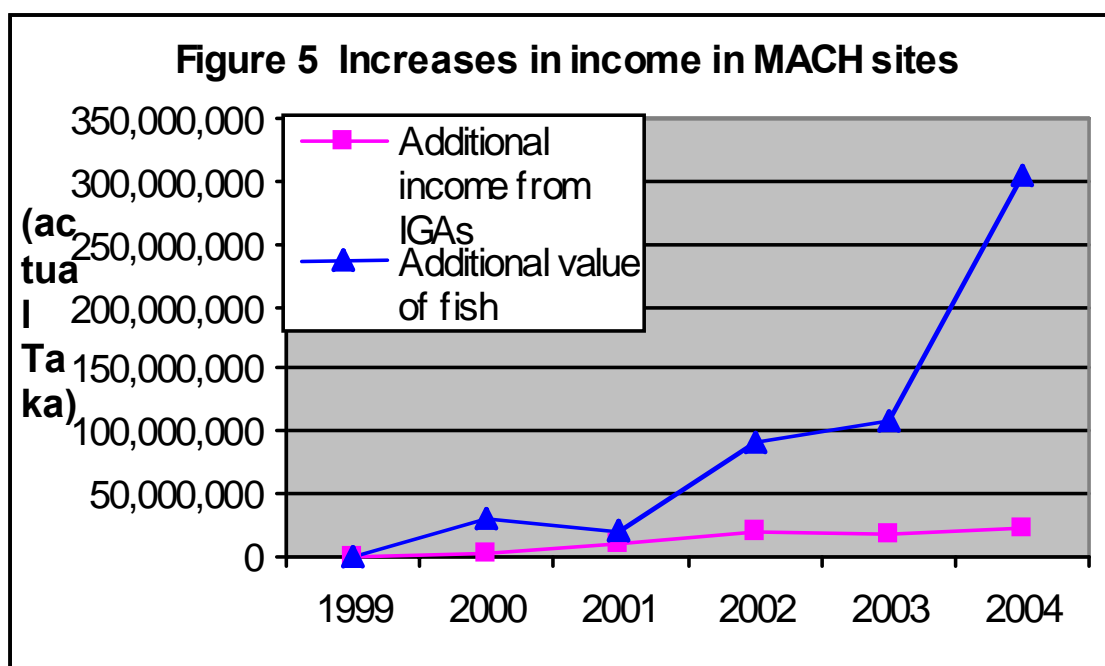
## Livelihoods and Human Capital

Over 5,500 of the poorest wetland resource users have joined savings and credit groups. These have helped the fishing communities refrain from fishing in protected areas and during critical fish spawning periods by providing training and credit to take up alternative income generating activities. This has helped reduce excess fishing, enabling fishing households to take up new enterprises such as poultry and livestock, or skilled employment as mechanics and electricians. Borrowers have substantially reduced their fishing effort. By 2005 almost 4,000 families had increased average income by about 65% over their previous reported incomes (Figure 4). Some were able to leave fishing, while others could reduce fishing during conservation closure periods while still increasing their incomes.

Fishers in the MACH project sites gained US\$ 4.7 million in 2004 (Figure 5) from higher catches associated with resource management improvements, as compared with baseline data from 1999. In addition, by 2005, those participating in training and credit activities earned an extra US\$ 0.8 million, mainly from new enterprises supported by the project, as compared with their pre-participation incomes (daily incomes rose from about US\$1 per day in 1999 to US\$1.34 per day in 2005). This primarily impacted the poor who are most dependent on aquatic resources. Over 85% of households in the project areas are involved in fishing, and all of those supported with training and credit were low income households owning less than 0.2 ha of land, and therefore the poor have benefited the most from the project impacts.



**Fig.4. Micro-credit support through MACH**



**Fig.5. Increases in income in MACH sites**

### **Governance and Social Capital**

The formalization of community-based organizations of resource users has helped to sustain impact and enhanced empowerment. The leaders of both RMOs and FRUGs are elected by ballot, and are responsible to their general bodies through quarterly meetings, and more widely through village meetings. The leaders of these organizations now sit along with local government officials and councillors in UFCs that oversee wetland management. For sustainability the Upazila Fisheries Committees are being endowed with a total of US\$ 0.53 million (Tk 36 million), the interest from which will primarily be used for continued restoration of wetland habitat by the Resource Management Organizations, as well as to cover the operations of the committees.

This system means that there are checks and balances between community organizations, Union Parishad and Upazila officials over the way they function, make decisions and use their funds, while the long term funding arrangement will maintain a focus for continued improvement and restoration of wetland habitats in these large systems. Savings and credit groups are now federated into 13 legal entities – registered membership-based social welfare organizations with elected leaders who also sit on the co-management committees. Moreover in a landmark policy decision, the government has permanently set aside eight “national” sanctuaries to protect wetland biodiversity that are managed by the community organizations. The government no longer auctions out fishing rights in these sanctuaries. The Department of Fisheries, through its national Inland Capture Fisheries Strategy is in process of adopting these institutions and the sanctuary approach on a larger scale as part of a policy shift towards community based co-management.

## THREATS, SUSTAINABILITY, AND POLICY

### Water quality threats

The experience of wetland management has not been all positive in MACH. One of the biggest industrial clusters in Bangladesh is located in Kaliakoir north of Dhaka, where there are many textile and dyeing factories. The communities reported that these industries use the surrounding wetlands, particularly Mokesh Beel and Ratanpur Khal, which flows through the beel, as a disposal ground for untreated waste, resulting in poor catches of bad smelling fish. Effluent from industries downstream in the Turag catchment also appears to be entering the river and is carried upstream during low river flows by tidal effect. As a result, water quality has deteriorated to a level which is unsuitable for certain types of aquatic life.

Regular monitoring results indicated that water in the beel and khal has biological oxygen demands twice the national acceptable standard and chemical oxygen demands four times higher than acceptable standards. Water also has seasonally high pH levels, and sulphide concentrations that averaged 50% above the national acceptable standard but peaked at five times that level (Table 7). High concentrations of heavy metals such as chromium were also found in surface water close to the industries, although aquatic plants were found to absorb some of this pollution such that sediments were within European permissible levels, the possible effects of animal and human consumption of these plants is now known. The problems were traced to local textile related industries which were found to be inefficient – producing more waste water with higher biological oxygen demand than both Bangladesh and World Bank standards. Focus group discussion and in-depth interviews with community members and health practitioners revealed that the perception of the community is that health problems are increasing as a result of industrial pollution of the wetlands that they traditionally use as a source of water to irrigate crops, for bathing and for fishing.

**Table 7. Median values of different parameters in water in seven locations of Mokesh Beel ecosystem in 2001.**

Parameter	Bangladesh Standard (mg/l)	Median value (mg/l)	Range (mg/l)
BOD	150	407	380-500
COD	200.0	960	350 – 1600
DO	4.5 - 8.0	1	0.6 - 1.2
TSS	100.0	195	115 – 427
Sulfide	2.0	3.1	1.6 - 10.2
Oil and grease	10.0	27	17 - 45

Research in the industries themselves identified potential alternative production options which can increase dye fixation by up to 70% and consequently save an average factory about US\$ 67,000 a year and significantly reduce repeat dyeing and effluent discharge. The studies also highlighted the need for more effluent treatment

facilities and better management of those that already exist. Effluent Treatment Plants are a legal requirement for factories approved after 1995, but in 2000 only two factories in the area had such plants and they were functioning below optimum. The project has worked with industries to advise on setting up treatment plants and one new one has been established and four more are under construction.

By late 2005 there were around 166 textile related industries (all are export oriented) in the area, compared with about 12 that existed when MACH started working there in 1999, so the pollution problem is worsening overall. This means that there is an immediate need to increase the rate of implementation of proposed pollution mitigation options if there is to be any reduction in pollution. Without this the efforts of the communities and MACH that have seen fish yields in the greater Turag-Bangshi area restored from about 60 kg/ha to about 300 kg/ha by 2004 are likely to be irreplaceably lost.

### **Sustainability and Policy Change**

Industrialization is not the only threat to the long term survival of fisheries and wetlands in Bangladesh. Locally and centrally those who once controlled or aspire to control water bodies to complement their social and political influence and to earn income, and who have been disempowered when community organizations have taken on wetland management, are a threat once project support and attention end. The sustainability of the resource base (the habitat), of fish catches, and of local institutions that have adopted good practices all remain to be observed in the long term. The pollution issue has demonstrated one strength of community organizations – in Kaliakoir the RMOs have spontaneously taken up local campaigns for cleaner surface water, and have linked with national advocacy groups.

In the long term there is a need for administrative and policy support to these systems. In MACH the Local Government Committees, now regularized as Upazila Fisheries Committees, have been vital. To strengthen their influence over enforcement of water quality standards, MACH has facilitated signing of an MOU between the concerned UFC and Department of Environment. In general the community organizations have been registered as legal entities, and have access to funds – revolving loan funds in the case of the FRUGs. For co-management and continued wetland restoration endowment funds have been left to provide an annual income for the UFCs, most of which will be disbursed as grants to RMOs for habitat restoration. Government orders establishing these are a necessary step, but equally important has been building the capacity of the community organizations to interact with government and speak up for their interests, and testing the operation of this system in the last two years.

Even so, these are only isolated examples of good practice among the more than 4 million ha of wetlands in Bangladesh. Therefore MACH has focused for sustainability also on influencing the adoption of its lessons and best practices in the policies, strategies and precedents of government. This will serve to strengthen long term co-management in the project sites, and enable more widespread adoption. MACH has focused on working with DOF as it developed its Inland Capture Fisheries Strategy, Action Plan and Programme. The concept and details of UFCs have been proposed by DOF to be established nationally for the purpose of coordinating co-management.



Establishing national wetland sanctuaries by taking them out of leasing has set a precedent for replication in other major wetlands of the country, and MACH is helping DOF and MOFL develop a proposal for Hail Haor to be designated as a “Ramsar Site” for its long term recognition and wise use. MACH is helping the newly established inland capture fisheries team within DOF to provide support for “graduated” water bodies and their community organizations. Dialogues are also underway with major textile manufacturer buyers and trade organizations with the objective of improving the management of textile mills and reducing pollution.

## ACKNOWLEDGEMENTS

We thank all of the staff of the MACH partner organizations who over 9 years have contributed to the achievements reported here. Thanks are also due to all of the government officials at central and Upazila levels who have contributed to the co-management systems that are now established, and especially the many community representatives in all three sites who have contributed their time and efforts to improve the status of their wetland resources.

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Conference Paper 09

A green horizontal band with silhouettes of people and a heart.

Sunamganj Community Based Resource  
Management Project (SCBRMP): an approach to  
sustainable beel fisheries management

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## SUMMARY

Sunamganj is a land dominated by floodplains with seasonally flooded tectonic depressions known locally as haors and smaller water bodies known as beels. People's livelihoods and culture are largely dominated by the haor economy where beel fisheries play a very critical role. Although the beel has a wide range of resources, the people at large have not been able to benefit from them. A small number of people by virtue of their power and influence have been exploiting the resources overriding all the codes of resource management and maintenance.

SCBRMP of Local Government Engineering Department (LGED) has a mandate to assist the people so they can get access to the resources. The project implements a process which is derived largely from a Community Based Resource Management (CBFM) approach. It is a demand driven approach set by a comprehensive discussion with a wide variety of stakeholders. Beel access is achieved through two steps. One is beel handover to genuine fishers on a long-term basis, and the second is initiating beel resource development activities. Under a series of Memoranda of Understandings, the project has been allocated beels (both above and below 20 acres in size) from concerned ministries and who hand over the water bodies to Beel User Groups (BUG) comprising of mainly fishers. A set of criteria is followed to select the BUG members and BUG functions under a byelaw that contains some core values to form an independent institution of beel users.

From beel selection to formation of the BUG and initiating beel resource development, a participatory approach is followed where local people's knowledge and experts' views are duly consulted at all stages of work.

BUG members are trained to raise their skill levels on group management and beel resource development. The beel resource development activities comprise of demarcation, re-excavation, swamp tree plantation, establishing sanctuaries and introducing conservation measures. Some surveys and studies on fish catch and consumption, fish marketing and biodiversity are also included in beel fisheries of the project.

One visible strength of the project's approach is its partnership with other departments and institutions. SCBRMP is implementing its beel fisheries activities at the field level with cooperation from the local administration, DoF and the WorldFish Center.

The project has a goal of access to 300 beels in Sunamganj District by June 2014. Meanwhile 55 beels of different sizes have been accessed and handed over to BUGs. Out of 55, 50 have been harvested and 10 have been brought under development activities.

The project is at early stage. It is advancing through learning by doing. Meanwhile a good number of lessons have already been learnt. Clearly, sustainable beel resource management is largely a social issue rather than technical and people's views are to be utilized with full potential for such natural resource management.

## INTRODUCTION

The project was developed based on the Country Strategy Opportunity Paper (CSOP) of IFAD and its goal lies with PRSP and MDG. Understandably, poverty reduction therefore is the prime concern of the project, and giving priority to the most deprived zone, Sunamganj haor area has been chosen considering its numerous vulnerabilities and backwardness.

The project will cover the entire 11 Upazilas of Sunamganj district and has a target to reach 135,000 households who are holding below 2.5 acres of farm land. The project will be implemented in three phases comprising a total of 12 years starting from January 2003 and ending in June 2014.

The project comprises of five major components. These are: Labour Intensive Infrastructure Development; Institution Building; Microfinance Services; Agriculture and Livestock Development; and Fisheries Development while gender and environmental issues are cross-cutting. Training, both for staff and the people, is another activity cutting across all components of the project.

The total cost estimate of the project is US\$ 26.28 million, with an IFAD loan of US\$ 22.0 million, a contribution of US\$ 4.5 million from the Government of Bangladesh and a US\$ 0.3 million contribution by the community/beneficiaries in labour, kind and cash.

The project follows a people centred approach. The core objective of the approach is to mobilize the poor and inspire them to accumulate their potential to build a self help society with a vision of achieving prosperity and aspirations to secure the future. With that view, grassroots organizations were formed, both for males and females, at remote villages over all the Upazilas<sup>1</sup> of Sunamganj district. In future this will build into a stronger and more effective institutional formation plan involving representatives from these primary groups to form a federation of poor communities.

The members of the organizations are being trained following need-based assessments to raise their human and technical skills in order to enhance their capacity to access and manage the livelihood resources sustainably. Furthermore, the project aims at establishing a pool of technically skilled activists

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<sup>1</sup> Administrative unit of the government under the District level.

to continue the technical extension services and maintain close relationship with extension components of the project.

The project also creates scope to access natural and other physical resources. These form capital for better investment through systematic savings accumulation. Access to credit for the poor is also a vital ingredient of the development approach of SCBRMP to assist the people in alleviating poverty.

The most challenging part of the project is access into beel resources. Having long-term tenure of beel resources and giving those to the genuine community for maintaining their livelihoods and ensuring their sustainable management are key indicators for assessing the success of the project.

## SCBRMP OBJECTIVES AND FACTORS TO BE CONSIDERED

Beel fisheries are part of the fisheries component of the project. Under this component the project will take over a total 300 beels during its total 12 year period of operation.

The core objectives of beel fisheries are:

- Transfer the beels to genuine fisher communities on a long-term basis
- Establish community based fisheries management
- Initiate development activities to restore the degraded resource base
- Initiate activities to establish conservation measures for fish habitat and biodiversity restoration
- Develop an institution of beel user groups for sustainable resource management

In order to attain these objectives some factors have been found to be crucial:

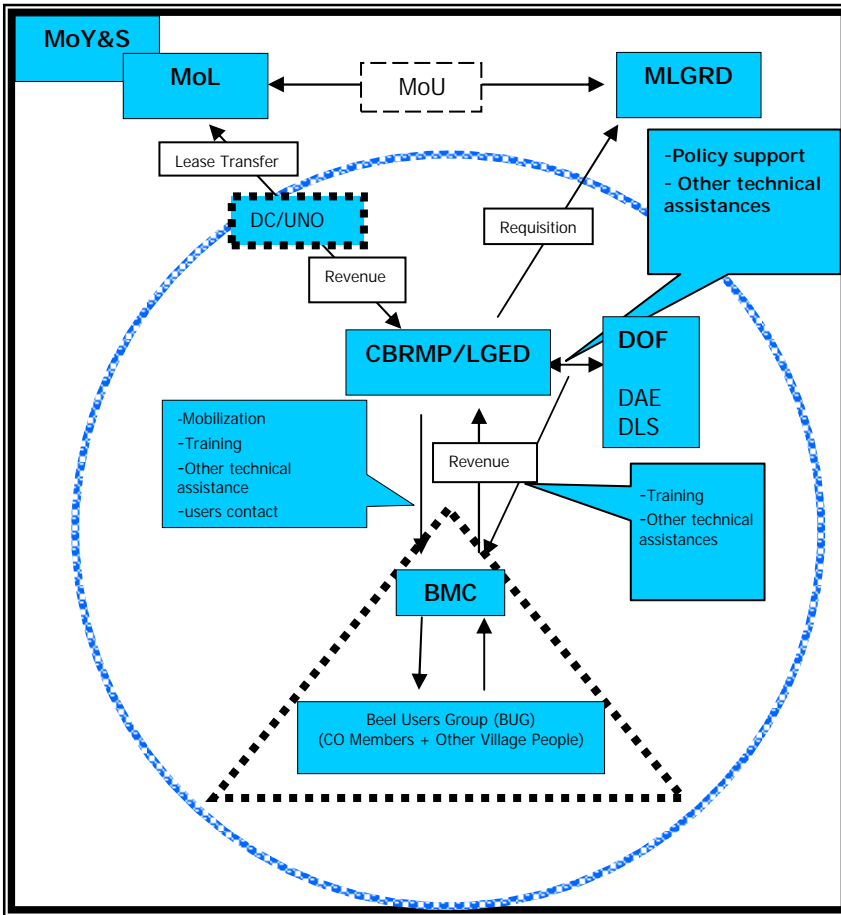
- Clearly defined and identified group of beel users
- Clearly defined boundaries of the resource base
- A responsive and transparent management
- Equitable cost and benefit sharing
- Long term user rights on resources
- Cost effectiveness
- Institutional, technical and legal support from concerned authorities for sustainable use of resources
- Community capacity to exclude non-user community members
- Local social and political support

## THE APPROACH

The approach includes the activities: resource mapping to understand the physical status of beel with identifying its command villages and intended

beneficiaries, setting criteria to select accessible beels, PRA based investigation to understand the resource status and its development scope, and, selecting genuine users and interested fishers for forming beel user group (BUG).

It is a process that involves the concerned Ministries along with the beel users to follow comprehensive guidelines conducive for promoting community based resource management. The guidelines ensure the roles and responsibilities of all concerned towards sustainable use of resources and benefiting fisher communities. Beels above 20 acres are transferred under a Memorandum of



Understanding (MoU) to LGED through the Local Government Ministry, and from LGED to the community. Beels below 20 acres are transferred under MoUs to LGED and then to the community. The transfer is made for total 20 years in two 10 year phases. The lease value of the beel is paid by the community and the process and conditionality for that is settled by an MoU which is mutually developed by the project and the community.

Fig. 1: Institutional framework for the beel transfer process

## ROLES AND RESPONSIBILITIES OF BEEL USER GROUPS

The BUG is the basic structure of the beel users. It consists of fishers who live in the beel command villages. The users are selected from a list based on social mapping where all villagers are listed by occupation and their wellbeing status. The BUG has a governing body called a Beel Management Committee (BMC). The BMC comprises 7 to 9 members and they lead the BUG being guided by byelaws developed by the BUG members after consultation with experts. The

BUG as the user of the beel has many roles and responsibilities. Of those, a few are regular such as group meetings, savings and maintenance of the beel and a few are occasional or seasonal such as depositing lease value, re-excavation of beel, planting of swamp trees, guarding, harvesting and conservation activities.

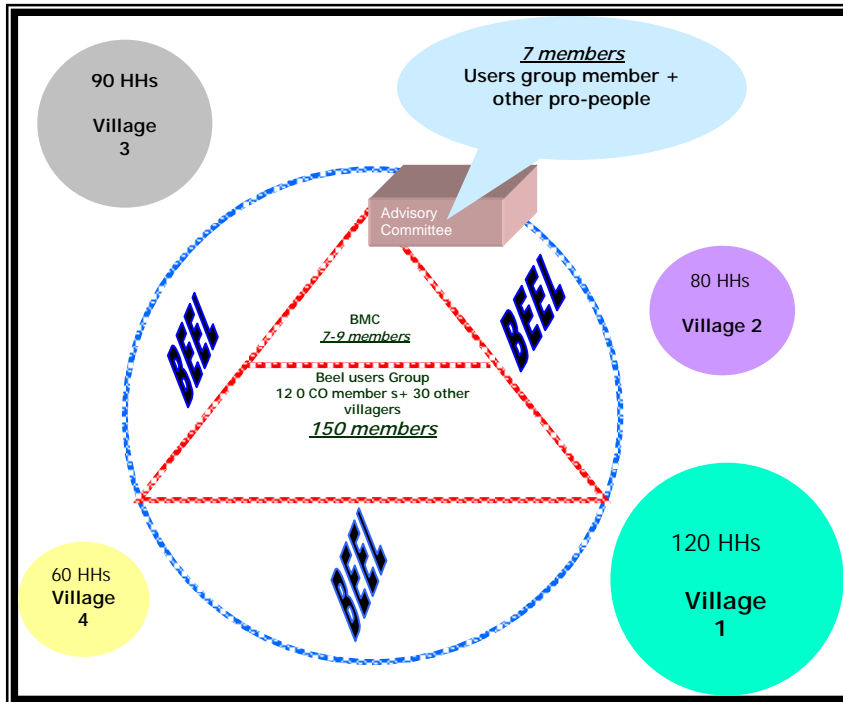


Fig. 2: The institutional structure of community based fisheries management

The most focused responsibilities of the BUG are to maintain the beel with sustainability and all actions in relation to beel management are carefully resigned to attain that.

In addition to the BMC there is a structure called the Advisory Committee. This is a structure formed consisting of local people with a view to assisting the BUG when there is crisis or conflict. The committee has no share in the beel resource or any voting rights in the formation of the BMC, but their role and support are counted as highly vital to the BUG to solve many local problems related to beel management.

### **Fishing rules and responsibilities**

Fishing is done in accordance with the Fish Conservation Act and some customary rules supportive to sustainable fisheries resource management. There is provision for three categories of fishing; individual, subsistence and group based seasonal major fishing. However the project is yet to formulate a concrete policy for subsistence and individual fishing, and therefore only group fishing is in practice. During the major fishing season, a group of fishers undertakes beel fishing which is usually completed in three or four rounds of fishing.



### **Income distribution**

Income from beel resources is distributed equally to all members of the BUG irrespective of gender and class of fisher. However, if anyone from the BUG gives any labour in beel management that is treated separately and compensated accordingly as decided by BUG.

### **Beel development**

Beel development is an important part of the beel fisheries. The focus of the activity is basically on fish habitat restoration and restoring the beel environment. The initiative comprises two kinds of activities one is compensating and other is remedial. Planting swamp trees and re-introducing scarce fish species come under the compensating measure and re-excavation of beels to remove silt and restore the connectivity of beel with the mainstream haor system falls under the remedial measure.

Development is undertaken based on a master plan developed with the participation of beel users, other villagers, representatives of DoF and DAE, administrative people and beel resource development experts. However the master plan is revised every year to fit it with the context and to make it more practical.

### **Monitoring and impact study**

BUG performance is monitored under the mainstream M&E system of the project on a monthly basis. Besides, fish catches and consumption, and benefit distribution records are maintained and registered at the BUG level and necessary reports are prepared at regular intervals.

Apart from this, some impact level studies on biodiversity, fisher livelihoods and marketing and value chain have been included in the fisheries component.

### **Conflicts and constraints to access**

Conflict in resource access particularly in haor areas is very common. In our experience the major reasons behind this are:

- Conflict of interest between vested interest group and genuine fisher
- Existing laws often favour the vested interest group and hamper the access process
- Lease values are sometimes not commensurate with beel productive capacity and the income it generates
- Excessive pressure from the authorities to transfer the lease immediately after it has been surrendered by the previous leasee before the BUG has been formed and is ready

It has been difficult to establish access to beels for fishers against the interests of vested classes even after they have legal rights to them. There are many legal

loopholes and through exploiting them, the vested interests create obstacles to legal access of fisher to beel resources. In some cases the lease value was not set at reasonable levels, when compared to the potential for production. This may be a result of irrational bidding by the vested groups in earlier bidding, thereby outplaying the poor fishers. Despite this, the high lease rate exists and therefore fisher communities may not be interested in those beels. Sudden surrender of the beel by previous leasee, thereafter forcing the authority to receive the beel before a community organization has been formed has been another major problem. These issues demand that there are amendments made to the leasing process. The leasing authority needs to think about the overall wellbeing of the resources and the fisher community beyond only revenue collection.

### Progress

The project is still at an early stage of beel access and development. Meanwhile the concerned Ministry has handed over 93 beels to the project, 22 above 20 acres and 71 below 20 acres (Table 1). Out of the 55 Beels have been given to BUG and the rest are in process. Out of 55 beels which have been given to BUGs, 50 have been harvested, and 10 have undergone development activities. Through all those activities the project has had many learning experiences some of which are bitter and some are interesting, but all are important.

Table 1: Beel transfer and activities

Activities	Target	Achieved
Transfer status from MoL and MoYS to CBRMP	93	93
Transferred to community		
> 20 acre	13	10
< 20 acre	54	45
BMC formed		
> 20 acre	13	10
< 20 acre	54	45
Harvested		
> 20 acre	10	10
< 20 acre	45	40

## LESSONS LEARNT

1. Access to beels might not be a major problem, but holding on to control of beels is often a big problem. If the process of beel selection and access is done through cooperation and consultation with the local community and through mobilising the users prior to handover of the beel, then access as well as retaining control over the resources becomes easier. However, conflict between vested interest groups and fisher communities is common because it is against the interests of the influential people in the

community often known as the 'elite'. Therefore establishing poor fisher's rights on beels is always difficult. It needs organised efforts with constant institutional support.

2. A comprehensive training scheme for beel users is required to build their capacity in social, technical and institutional areas to attain sustained management of the beel fisheries.
3. An effective advisory board is a critical need to assist the BUGs to deal with conflicts related to beel access and management. For that it is necessary to mobilize local champions and other people in favour of the approach to support and assist the BUGs through an Advisory Board.
4. Value based rules and laws developed by BUG with the assistance of community based fisheries management experts members should be in place for good governance of beel management with the focus on establishing a rights-based stewardship approach, and thereafter to achieve sustainable management of beel fisheries.
5. Beel demarcation is an essential part of beel fisheries management. A well coordinated and cooperative approach by concerned Departments with active participation of the community is necessary to implement it successfully. Successful demarcation is an indicator of community's strength and interest to get access to the beel.
6. Beel resource development should be integrated with the overall haor system development as beels are an integral part of the wider system. A haor based total approach is required for beel development.
7. Arranging for fisher communities to pay for leases is not a problem if their rights to exploit the resources in the long-term are guaranteed and in all aspects of beel management and development their participation and interest is ensured in a transparent manner.

## CONCLUSION

Community based beel resource management is getting increased attention from all concerned with establishing better natural resource management. Its contribution to increased production, restoring natural diversity and benefiting genuine fishing communities are highly appreciated. The success of such management basically lies in its values and the interest of the community and support from the concerned institutions. It gives the community rights and responsibilities to take care of their resource base and make their livelihood on it by a process under their control. The ultimate success of it largely depends on better coordination and cooperation among the concerned policy institutions, administrations, intermediary organizations and the community. People's capacity and access in decision of natural resource management is crucial to attain a sustainable resource management.

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Conference Paper 10



## Common Interests, Private Gains - A Study of Co-operative Floodplain Aquaculture

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## ABSTRACT

In recent years a number of floodplain aquaculture projects have sprung up in the Daudkandi area of Comilla District. Key to this development are a number of unique organisational and financing arrangements which facilitate the development of necessary infrastructure through issuing shares to farmers who have land in the targeted floodplain area.

In February 2007, a short review was carried out to better understand how floodplain aquaculture was affecting a range of local social, economic and environmental issues. The production and economic performance of floodplain aquaculture projects was impressive; and they were obviously having a positive effect on local economies, general security, people's nutritional status and employment and service opportunities. However, this approach, productive though it is, effectively changes a seasonal, open, common property water resource, into a closed, privately owned one and it was found the opportunity for some traditional livelihood foraging activities had been reduced or lost. In general, poorer people in the area were unable to benefit directly from the project share offer.

The review concluded that the newly created embankments were probably restricting the movement of wild fish stocks onto the floodplain, and the internal refuges created were probably not having a significant impact on the dry season survival of wild fish stocks, except in cases where rarer species had been deliberately targeted for conservation and induced propagation. The review recommended that Government funds would be best spent on carrying out a comprehensive zoning exercise to enable the effective, planning, monitoring and regulation of floodplain aquaculture and to avoid potential conflict situations developing between traditional fisher communities and floodplain aquaculture farmers.

## INTRODUCTION

Floodplain fisheries are crucial in providing food, income and employment for millions of people in Bangladesh. Inland open waters total more than 4 million hectares in area and are thought to be producing more than 500,000 metric tonnes of fish, annually. Typical yields from these flooded areas are between 150 – 350 kg /ha. However, pressures on these resources are increasing. These pressures include; the construction of flood control, drainage and irrigation projects; over fishing; the indiscriminate capture of brood fish and juveniles; revenue-based management of jamohals; the removal of water from fish habitats for crop cultivation; the discharge of municipal and industrial wastes; the use of insecticides and chemical fertilizers; and the reduction in floodplain area due to siltation and encroachment.

In Bangladesh, aquaculture continues to diversify and develop rapidly and is seen by many as the most realistic way to secure the nation's future fish supply needs. Basic fish production techniques are well understood by many

farmers, inputs such as seed and feed are widely available and thriving service provision and marketing networks exist.

The stocking of large water bodies is now well established in Bangladesh and recent initiatives have shown that large floodplain areas if controlled and managed, can generate significant fish production. Yields from these floodplain aquaculture systems are usually in the range of 1 – 3 t/ha, i.e. 10 times that normally possible from naturally occurring fish production. It is this dramatic increase in productivity that has been driving the development forward.

In February 2007, a short review was carried out in Daudkandi Upazila, Comilla District, Bangladesh, to better understand how recent developments in floodplain aquaculture in the area, spearheaded by the local NGO, SHISUK, were affecting a range of local social, economic and environmental issues. This paper summarises the main findings from this work.

## A BACKGROUND TO DEVELOPMENTS IN DAUDKANDI.

Daudkandi Upazila had long been recognized as a food deficit area. In the lowest lying areas, the long seasonal inundation prevents many farmers from growing more than one crop a year. In slightly higher areas an *Aman* rice crop can also be produced, and in the highest areas, Aus, Aman and Boro sequential cropping is possible. Irrigation coverage, through deep tubewells, shallow tubewells and low lift pumps is around 42% of the cultivated area, (BWDB 1994).

Until recently, unemployment and underemployment was common and seasonal out-migration to urban areas occurred during the wet season. September to November was recognized as famine months, when great hardship was experienced by many farming households. At that time of year, fish caught from the floodplain, albeit in small amounts, contributed greatly to maintaining nutrition standards and health, and even provided a modest income if a surplus is caught. As the area was extensively flooded throughout the wet season, the main mode of transport at this time of the year was in country boats, limiting the free movement of goods and people.

In 1992, the area was transformed through the construction of a 45.5 km long embankment that protected an area of about 327 km<sup>2</sup>, (including Daudkandi Upazila) from flash flooding from the Gumti River, and allowed more consistent crop production and settlements to become established. It was this development that created the conditions for floodplain aquaculture to emerge in the area. The possibility of utilizing seasonally flooded private lands for aquaculture had first been considered by a group of landowners in Dhanuakhola Adarsha Matshya Prakaalpa, Charipara in 1987. It is understood that their first attempts were unsuccessful. However, after the Gumti embankment had been constructed, others were encouraged to try. In 1996, there were a number of new attempts to establish floodplain aquaculture in the Daudkandi area but without NGO support. The introduction of a mechanism of issuing shares to landholders and a formal way of conducting

fund transactions through local banks were also unsuccessful. However, in 1996, the Pankowri Fisheries Project was created and this was to become the first successful floodplain cooperative aquaculture project involving local landowners, outside investors, and an NGO.

The NGO SHISUK has been involved since Pankowri's inception and still holds a 20% share in the venture. Production and profitability has increased over the years and records for 2005 show fish production to be around 232 metric tonnes<sup>1</sup>. In 1997, the Project was registered as a company, under the Joint Stock Company Act. For its outstanding contribution development, SHISUK was awarded the National Gold Medal in 1999. (CIRDAP 2002)

News of the successes of the Pankowri Project spread rapidly around the surrounding area and by 2004 more than 90 similar projects, covering an estimated 5,000 ha, had been established in Daudkandi and neighbouring Upazilas, (PPRCD 2005). These floodplain aquaculture projects have transformed the local landscape. SHISUK expanded its programme during 2003 and 2004 and developed partnerships with four other floodplain projects in Daudkandi. In these new projects, SHISUK has attempted to develop a more inclusive community approach and has experimented with ways to achieve greater equity and the more significant involvement of women.

The Pankowri Project continues to develop, now guided by their Board of Directors, with SHISUK playing a less active role. The recent purchase of a truck by the Project, to assist with fish marketing, and plans for the establishment of a feed mill and hatchery, suggest that the project is looking to vertically integrate its activities. From the large number of private ponds observed being excavated, there also appears to be some management fragmentation of the cooperative enterprise.

SHISUK continues to modify its approaches, using Pankowri as 'its laboratory'. Aware of some of their limitations, they have recently invited BARC, DOF and the WorldFish Center to help them carry out research on a number of socio-economic, management and technical aspects of their floodplain aquaculture model.

## ORGANISATIONAL AND FINANCIAL ARRANGEMENTS

The success of floodplain aquaculture in the area is at least partially due to the unique organizational and financial arrangements facilitated by SHISUK. Following community mobilization efforts, the capital required for the necessary embankment work to make floodplain aquaculture possible, is accumulated through floating shares to landholders in the area, so that they can invest jointly in the enterprise, thereby eliminating the need for development project support.

SHISUK supported projects adhere to a number of core principles including good governance, transparency and accountability. The NGO maintains a

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<sup>1</sup> Production for 2006 is estimated in excess of 400 mt.

20% shareholding in the operation and there is a 1% cap on individual share holdings. In some projects a small number of shares, (4-10%) are held in reserve for the landless. The distribution of net profits amongst the members of SHISUK projects is organised as follows; 50% is paid as a dividend to the owner of project shares; 27% is paid out as land rent to the owners of land, and water bodies inside of the project; 20% is kept as reserve (for investment in the following year and contingencies; 3% is spent on social welfare, such as donations to mosques or temples. SHISUK is now planning to test this approach in a number of new areas, including Netrakona, Kurigram, Gaibandha and the Chalan Beel area.

## WINNERS & LOSERS

There is no doubt that floodplain aquaculture has a profound effect on the local economy; the Poor; livelihoods; women and the environment. These are now examined in turn.

### **The Local Economy**

A new resource system is created through the process of land enclosure and floodplain aquaculture projects contribute significantly to local economies. Fish production in terms of unit area, has increased by many times. The creation and maintenance of the embankments has created work opportunities and facilitated the rapid expansion and movement of people and goods.

The production and profit figures from Shisuk projects have been impressive. In 2006, the five SHISUK projects produced more than 800 tonnes of fish from 344 ha, (an average fish production of 2.3 tonnes/ha). It is estimated that around 7,500 tonnes of fish are now produced from floodplain aquaculture from an area that traditionally produced around 750 tonnes through conventional capture fisheries. This floodplain aquaculture production would have a value of around 450 million taka, (6.4m US\$).

The local economy can now employ more people and out-migration has been reduced<sup>2</sup>. Incomes earned from the aquaculture projects have boosted the local economy through both backward and forward linkages. The local economy therefore gains from both the direct benefits of the projects (increased production, profits, incomes etc.) and from the indirect benefits that are transmitted through backward linkages (mainly from the supplier of inputs for the fish production). Near to the Pankowri Project Offices, a growth centre, featuring a range of small shops and businesses has sprung up.

It was reported from a number of sources that floodplain aquaculture projects have a calming effect on the local communities. Perhaps because previous desperate measures are no longer necessary, the general law and order

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<sup>2</sup> A number of local people reported that seasonal in migration has replaced the out migration that was common in the area before the projects began.



situation is said to have improved in many areas following floodplain aquaculture projects.

### The Poor

Despite the efforts of SHISUK to achieve equity in their share distribution, it appears that the poor are not benefiting equally. Table 1 details the findings from a PRA exercise conducted in 2 project villages and shows share distribution trends suggesting that poor people can only receive direct benefits in a small number of cases.

**Table 1: Livelihoods impact from floodplain aquaculture**

Village	Wealth ranking	Proportion of total households	Proportion of crop land holding	Proportion of shares held	Proportion of benefit
Khillalpar	Rich	15%	85%	80%	70%
	Middle	55%	15%	10%	22%
	Poor	30%	0	10%	8%
Minardia	Rich	13%	50%	43%	40%
	Middle	66%	50%	43%	40%
	Poor	21%	0	15%	20%

The overall picture may be bleaker than this, as it is by no means clear whether the genuine poor will be able to retain shares over time, even if they are allocated to them at the start of a new floodplain aquaculture project. It seems all too likely that the majority of shares in profitable projects, will end up in the hands of a small number of influential people

### Livelihoods

The collection of fish and other aquatic produce from inundated private land has always been considered 'open access' in Bangladesh. However, floodplain aquaculture is a privatisation of the commons and changes a seasonal, open access, common property resource to a year round, closed, private property resource. As a result there are a number of lost livelihoods opportunities. These include floodplain fishing (and access), duck raising, fuel material collection, fodder material collection and jute retting. In addition there are a number of forced changes to traditional agriculture cropping patterns. However, there are many new service provision opportunities that landless and poor people can engage in that result from floodplain aquaculture. Table 2 lists some of these.

**Table 2: Service Provision Opportunities in Floodplain Aquaculture**

Backward linkages	Forward linkages
Fingerling nursery operators	Ice plant operators
Fish Hatchery operators	Ice supplier / middlemen
Fingerling traders	Ice carriers (transport)

Fish feed sellers	Fish Aratder
Lime traders	Middlemen in fish Arats
Fertiliser dealers	Fish transport truck / trolley owners
Bamboo fencing makers	Bamboo made fish basket makers
Bamboo fencing sellers	Bamboo made fish basket sellers
Rickshaw / Van owners	Rickshaw / Van owners
Rickshaw / Van puller	Rickshaw / Van puller
Cow dung /Poultry litter suppliers	

A PRA exercise carried out in Baronager Project suggested that around 330 man days/ha of employment and direct service provision work were being generated by the aquaculture project. Other livelihood benefits exist including employment during the 'famine months' of September – October.

### Women

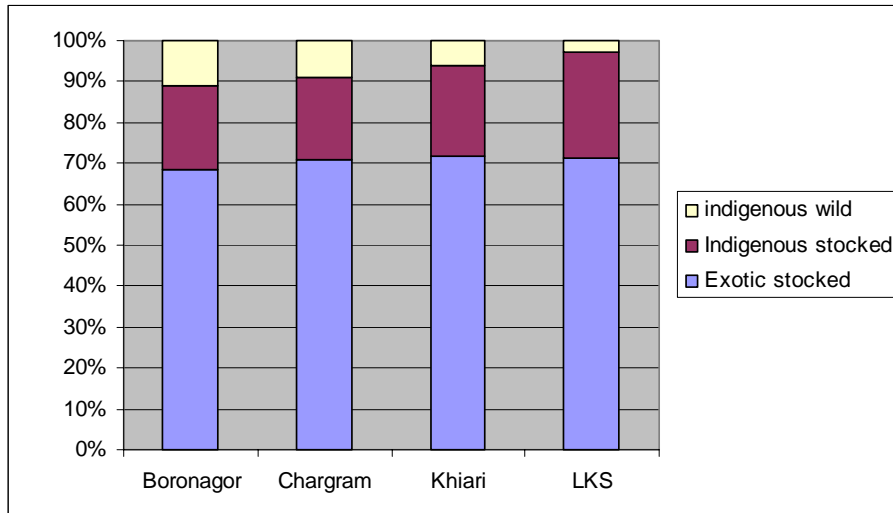
There were only a few examples found of women being directly involved in floodplain aquaculture activities. These included women nursery producers, cast net fishers and fish processors. SHISUK have facilitated their representation on several project boards and provide micro-credit for a range income generating activities. Women interviewed reported that the projects had greatly enhanced their mobility and the degree of respect they could earn through involvement in the new economic opportunities and activities.

### The Environment

SHISUK and other floodplain aquaculture projects claim their activities are having a number of positive effects on the wild fish stocks and the environment. Dry season sanctuaries have been excavated in a number of areas and the free movement of wild fish is encouraged through using large mesh screens on the embankment culverts. Wild fish of between 8-10 species, make up between 5-15% of the total harvest biomass. Their contribution is inversely proportional to cultured fish production. It is likely that wild fish stocks are benefiting from the feed and fertiliser applied; the extended inundation period and the absence of fishing pressure during the grow out period.

In reality though it is likely that water flows and fish migrations are restricted through the embankments established for floodplain aquaculture and increased fishing pressure probably exists outside of the cultured area. The pond-like conditions created for culture mean that many ecological niches no longer exist on the floodplain and the eutrophication of the water body may suit some species, better than others. Overall, it is likely that wild fish and other aquatic animal biodiversity is reduced within floodplain aquaculture, The targeted protection of certain high value fish such as Chital, (*Notopterus chital*) and Aye, (*Mystus aor*) in dry season sanctuaries may however be making a significant contribution to the availability of these species on the floodplain in the wet seasons that follow.

The predominance of between 8 and 10 species of exotic fish species used by most projects may also pose a threat to the environment. Figure 3 clearly shows the high contribution that exotic fish species make to the final biomass.



**Fig.3. Biomass contributions of indigenous wild, stocked & exotic fish species**

Positive environmental benefits were also claimed through the effects of the floodplain aquaculture management on agriculture. There appears to be an increased level of environmental awareness amongst shareholders, many who are adopting IPM principles in their Boro Rice production, in an attempt to protect adjacent dry season fish stocks.

Many farmers are reporting increased rice production of between 10-15% and a corresponding reduction in ploughing, irrigation, weeding, fertilizer and pesticide costs, making rice farming more profitable. These gains, together with the additional income through fish culture may maintain the viability of extremely small landholdings and help reduce pressures on farming families to sell their land.

## CONCLUSIONS

This paper has attempted to present a balanced view of the issues facing floodplain aquaculture development and to highlight some the winners and losers that emerge as the development occurs. Positive aspects include the high production and economic performance levels of floodplain aquaculture and its capacity to spread to new areas without a concerted extension effort from a development organization.

The systems of raising funds through share offerings, in order to amass the capital to build the enabling infrastructure appears is inspired and may be key to achieving stakeholder ownership of the projects. Indeed, public funds need not be used to finance floodplain aquaculture infrastructure or input costs.

Floodplain aquaculture cannot be labelled an inclusive community approach, as landholding is the key issue in determining participation. Attempts by NGOs to directly involve the landless and women look token, superficial and unlikely to be sustainable in the long term.

In addition, a number of traditional livelihood opportunities are lost as areas come under floodplain aquaculture, although these should be offset against the significant employment and service opportunities for economic involvement created for a wide range of players. NGOs can play a useful role in aligning their pro-poor and pro women development programmes to the significant service provision opportunities that result.

Floodplain aquaculture cannot really be said to be considered to be enhancing natural floodplain fisheries production or biodiversity except in the cases where selected species are deliberately targeted for protection and propagation. There is a basic incompatibility between floodplain aquaculture and the more conventional community based fisheries management approaches used in Bangladesh and future conflicts between traditional fishing communities and farmers wishing to establish floodplain aquaculture seem likely. To counter this it is suggested that Government carry out a comprehensive zoning exercise to identify priority aquaculture and fisheries areas on the floodplains.

There are a significant number of knowledge gaps which prevent a more complete understanding of floodplain aquaculture development and these include the extent and severity of lost livelihood opportunities, the social, economic and organisational aspects of projects and the design, effectiveness and contribution of dry season refuges to wet season floodplain fish production. Until these and other research issues are better understood, it is recommended that Government adopt a precautionary approach to the development of floodplain aquaculture.


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Conference Paper 11



## When Co-management Fails: A Review of Theory and Lessons Learned from Reservoir Fisheries in the Dry-Zone of Sri Lanka

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## ABSTRACT

Over recent decades co-management has become an increasingly popular form of governance reform in many developing countries. Viewed as a means of promoting sustainable and equitable management of natural resources, it has seen wide application in small-scale inland fisheries. However, perhaps because of its worthy credentials, there has been insufficient critical assessment of the results. This paper commences with a review of underlying theory which is then used to explore the reasons for failure of a co-management initiative in Sri Lankan reservoir fisheries between 2001 and 2002.

Co-management thinking arose from an earlier body of common property theory (CPT) which posited private or public ownership of the commons as the only rational response to increasing resource pressure. By contrast the co-management view states that under certain conditions, management is best left to local users, with support from the state, civil society or market sector where necessary. In turn, critics of co-management's rationalistic underpinnings point to a lack of cultural or political embeddedness which limits understanding of how power and accountability is distributed and shapes collective behaviour. Others suggest that the contentiousness of the CPT / co-management debate has resulted in neglect of key empirical features of fisheries commons – most critically the complex causes and consequences of change in fishing effort.

In the Sri Lankan case-study, emphasis is on understanding the environmental, technical and socio-economic drivers of effort change. The co-management initiatives took place in two small-medium size reservoirs (788ha and 1546ha) in Northwest province. These support artisanal gill-net fisheries, predominantly for exotic tilapias marketed on a highly local basis. The co-management strategy which involved local fisheries officers and fishing co-operatives, centred on fishing restrictions designed to sustain yields and increase mean catch size. Despite initial enthusiasm, the restrictions collapsed after 4-5 months with the onset of opportunistic free-riding. This was due to; lack of enforcement capacity, disproportionate hardship faced by the least economically mobile fisher groups and political patronage relations. Also, as compliant partners, the co-operatives had weak leverage in the decision making process.

Despite the short duration of effective restrictions, simultaneous analysis of local market trends demonstrated a remarkable rebound in yields pointing to the resilient regenerative capacity of the tilapia fishery. Furthermore historic commodity price data reveal long-term tilapia price stability and a close match between demand and supply even as fishing pressure has increased. Despite negative impacts on indigenous biodiversity, these features suggest fears of over-exploitation are unfounded and question the underlying premise for the co-management interventions.

Finally, results are used to highlight contextual differences with floodplain fisheries in Bangladesh, where declining wild harvests and the emergence of a vibrant aquaculture industry present very different challenges. Results caution against over-reliance on co-management as a blue print approach.

There is instead a need for detailed contextual analyses which move beyond a view of fisheries as closed-systems to incorporate broader livelihood based perspectives.

## INTRODUCTION

Common property resources such as fisheries, forests, rangelands, ground water resources and wildlife present formidable challenges to resource managers. Yet inland fisheries, the focus of this paper, are of disproportionate importance to the poor, relative to their volume and extent. Most are small-scale with over 90% of recorded inland fisheries catch; 8.2 million tonnes in 1998 (FAO 1999) coming from developing countries. Actual production is likely to be much higher due to uncertainty associated with micro-dispersed landings and high levels of localised subsistence consumption. Consequently inland fisheries have often been under-valued by policy makers.

Co-management can be defined as a partnership between the community of local resources users, other primary stakeholders (e.g. fish traders, service providers etc.), government and NGO's who together share responsibility and authority for resource management (Macfadyen et al 2005). The co-management approach also serves to shift emphasis from a fish-production to a people centric focus within the more holistic context of rural communities (ODI 2002). Its popularity amongst policy makers has been driven by recognition of a need to formalise existing community management practices within the wider legalistic and governance frameworks as a response to resource depletion and conflicts associated with rising fishing pressure. Decentralisation policies being pursued in many developing countries have also contributed to an enabling policy environment (Macfadyen et al *ibid*).

These factors, perhaps together with the 'participatory' merit implicit in the notion of co-management have resulted in widespread donor support for pilot programmes. However, there has been little rigorous evaluation of the anticipated impacts on target beneficiaries or with regard to the likely sustainability of these institutional forms.

Such assessments are essential if co-management is to be validated against alternative modes of governance reform. This paper is concerned with evaluating the potential of co-management strategies in small-scale inland fisheries as a means of empowering the poorest groups dependent on these resources to benefit from, and manage them sustainably.

The paper commences with a brief chronological review of theory relating to the management of the commons highlighting major policy impacts over recent decades. This is followed by a case study of co-management in two artisanal reservoir fisheries of the lowland Dry-Zone, Sri Lanka. The failure of these interventions is assessed in the context of the preceding theory. Finally, the relevance of the findings is used to highlight the comparative advantages of different co-management options in the context of Bangladesh floodplain fisheries.

## CHALLENGING THE CONSENSUS – A REVIEW OF COLLECTIVE MANAGEMENT THEORY

Over recent years the debate over how to best manage natural resources traditionally used by many individuals under shared access arrangements has revolved around two broad notions of (1) top-down management and (2) community or co-management (Fig. 1). The fisheries NR sector has been particularly instrumental in the development of both schools of thought.

The top-down management approach is associated with common property theory (CPT) which arose from a body of quantitative equilibrium models propounded by economists and natural scientists from the 1940's onwards (e.g. Von Neumann and Morgenstern, Schaefer 1954, Gordon 1954 and 1944, Hardin 1968). Ecological and economic concepts such as maximum sustainable yield, carrying capacity, resource rent etc. were incorporated in strategic game play models which assumed rational self-interest as the basis of decision making behaviour. The now familiar end point of Hardin's game play in his seminal *Tragedy of the Commons* (1968) was that due to opportunistic 'free-riding' behaviour, common property resources will ultimately be over-exploited and depleted without some degree of private enclosure or government access regulation.

This view has since been challenged by the community/ co-management proponents advocating decentralisation and local level management reforms for much of the commons. Rather than being a discrete theory, this view arose from a 'reactionary' body of inter-disciplinary research initiated by human ecologists and anthropologists in the 1970's (e.g. Acheson 1981, Berkes, 1977). These researchers used empirical case studies from natural resource settings around the world to challenge some of the basic assumptions underlying CPT.

A key premise of the 'top-down' management view is that resource users are unable to self-regulate due to the open access nature of the resource. Community management protagonists responded to the reductionism of this view by differentiating between two key features of shared resources; subtractibility - the degree to which one person's use will subtract from another and excludability the ability to control the number of resource users in the production system (Ostrom et al 1999, Berkes 2006). They went on to show under certain ecological and institutional forms, these features were sufficiently low/ high respectively to predispose local level NR management as the most sustainable and cost effective management forms. Communities, they observed, do in fact frequently develop sensible precautions against resource depletion based on a range of legally pluralistic social institutions including unwritten or customary local laws. Their conclusion is that 'open access' and 'common property resources (CPR)' are in fact two sub-sets of a wider 'common pool resource' where locally managed CPR could be considered as a viable fourth property estate (i.e. together with private, public and open access regimes).

In the 1980's the earlier critique of CPT was extended by political scientists influenced by the 'new institutional economics' (Ostrom 1990, Platteau 1989, Pinkerton 1989, Jentoft 1989). The 'neo-institutionalists' argued that economic



outcomes in the commons could be closely correlated with institutional arrangements and their associated transaction costs (literally the costs of co-operation). Here, institutions are narrowly viewed as 'systems of rights and rules providing incentives and disincentives for individuals to minimise transaction costs' (Ostrom 1990), emphasising the distinction between local/customary and external / modern institutions. This resulted in the earlier anthropological emphasis on local community involvement in management progressively giving ground to a broader 'co-management' view operating in the 'interface between the state, civil society and the market' (Ostrom *ibid*). Ostrom's approach to the problem of the commons involved the design of durable cooperative institutions organized and governed by the resource users themselves (i.e. rather than public or private control). Her eight 'design principles for durable common property resource institutions' expounded in her landmark work 'Governing the Commons' (*ibid*) was to have a major influence on other researchers, policy makers and NR managers. The principles include clearly defined resource boundaries, user dominated mechanisms to resolve conflicts and alter rules, monitors who are resource users or accountable to them, graduated sanctions and support / recognition of self-organisation rights by external authorities.

The emergence of the co-management view coincided with the liberalisation of centrally planned economies in many developing countries. It was consistent with over-lapping policy goals of governmental and non-governmental sectors by fulfilling a need for fiscal prudence by states coming to realise that abundant micro-dispersed natural resources traditionally under common ownership were frequently beyond their ability to manage and coincided with the emergence of the participatory development paradigm in the NGO sector.

McCay and Berkes (1994) framed this co-management position within the wider management context (Fig 1) proposing a continuum of seven co-management 'partnership arrangements', distinguished by degrees of power sharing and integration of local and centralised management systems. This framework will be returned to below within the context of a more recent divergence in the 'management debate'.

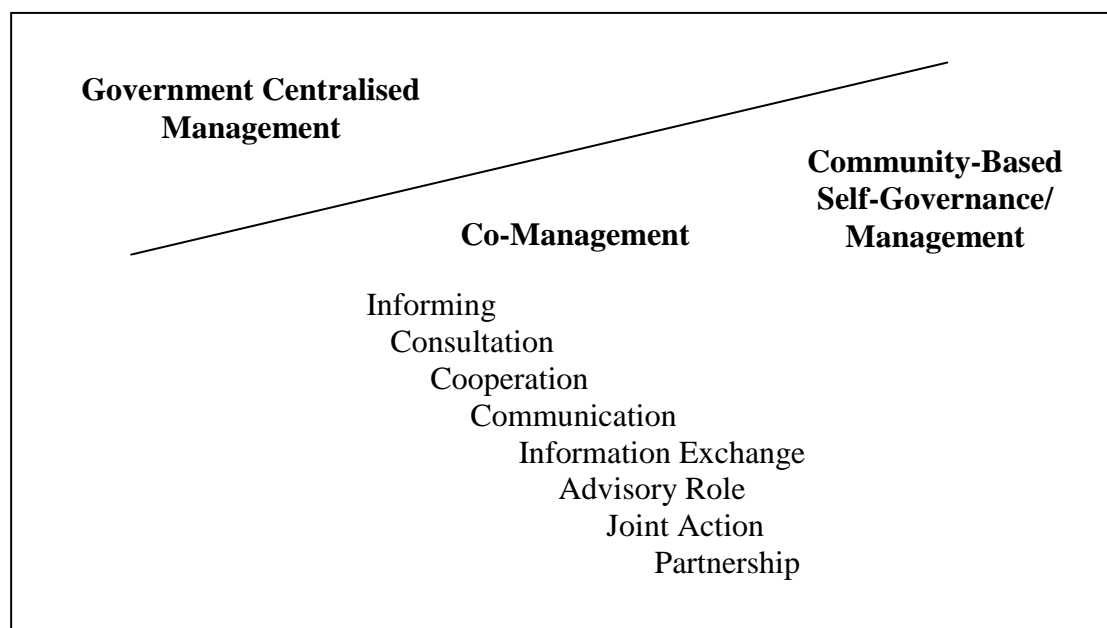


Fig 1. Biopolar co-management framework proposed by McCay and Berkes 1994 (modified from Bene and Neiland 2006)

More recently Jul-Larsen *et al* (2003) critique both sides of the management debate i.e. the model-based management and neo-institutionalist co-management schools. They propose a possible third 'no-management' option as an alternative to classical management theory's emphasis on limiting numbers of fishermen and co-management strategies. Their research focussed on biological, institutional and economic characteristics of small and medium sized lake fisheries of the South Africa Development Community (SADC) region (Democratic Republic of Congo, Malawi, Zambia and Zimbabwe). They illustrate their contention by pointing to the fact that static or slow change in fishing effort in some of the African lakes they studied does not correspond with any effective form of management, either at the state or local level.

The point of departure for their critique is the lack of socio-cultural or political embeddedness in CPT. Such context is critical to understanding how power and responsibility is distributed amongst different interest groups in society. Mosse (2006) makes a similar point, arguing that 'equilibrium outcomes based on autonomous rational self-interest do not adequately represent the social and political forces acting on traditional systems and behaviour'. Bene and Neiland (2003) characterise such forces as the drivers of *de facto* governance, distinguishable from a concept of management as the technocratic implementation of collective actions in accordance with *de jure* rules arising from governance decisions at a higher 'constitutional' level (Schlager and Ostrom 1992).

A recent body of anthropological work has also challenged the 'neo-institutionalist' clear-cut dichotomy of modern and local institutions - corresponding with formal and traditional rules of the game often framed in opposition, as a-historical and over simplistic. Instead the rules governing local management systems emerge as 'a result of negotiation and accommodation in long term power struggles with different actors, local and external basing their claims on 'different logics and values' that emerge over time (legal pluralism). Ambiguity and contradiction rather the internal coherence is often the norm. This 'constructivist' view implies that access regulation is a consequence of many overlapping sets of norms rather than just the consequence of a tension between external formal and traditional local rules frequently cited in the co-management literature.

Bene and Neiland (2006) point to the 'tyranny of participation' that can be fostered by uncritical application of the McKay-Berkes co-management framework (Fig 1). As a descriptive framework it has been used extensively for comparative purposes – but unlike CPT offers no analytical basis for assessing mechanisms underlying management reforms. The mono-dimensional concept of a gradient of power sharing at the core of model has, they suggest, mislead many users to over-rely on a lack of devolution/ local participation as an explanation for the failure of co-management approaches. Although participatory theorists emphasise the role of participation as the main or only source of empowerment, it is in fact but one of at least three pillars frequently cited as a requisite for decentralisation to be an effective

governance reform; the other two being transparency and accountability (Power 1997). Bene and Neiland (*ibid*) suggest that accountability – particularly when operating in a downward direction (i.e. towards the consumers of management decisions) – plays a more critical but frequently undervalued role. Indeed, without strong accountability all participatory approaches are likely to fail.

Furthermore, whether downward accountability is best served by weak participation (i.e. consultation or communication) or strong/ direct participation (i.e. joint action – Fig 1.) is likely to be highly context specific. From a review of 50 fisheries in developing countries they conclude ‘each fishery in each society has its own balance point’ on the scale of management intervention from state to local level. The inappropriate imposition of strong participation can have negative consequences such as local elite capture in heterogeneous communities with marked pre-existing power differentials, while the imposition of ‘pseudo-participation’ amounts to manipulation of beneficiaries by development professionals (Deshler and Sock 1985) potentially resulting in increased dependency. Conversely, uncritically citing weak participation/ power sharing for the failure of management reforms may incorrectly lay the blame on the implementing agency rather than the community. The authors conclude that greater attention should be paid to how, rather than how much, power is shared.

Jul-Larsen et al (*ibid*) also critique what they see as the management theorists over-emphasis on ‘who’ rather than ‘what’ should be managed, which they term ‘the management-belief problem’. Firstly they point to a body of work during the 1990’s termed the ‘new ecology’ derived mainly from empirical studies on forestry, pastoralism and other land use (e.g. Ellis 1988). These researchers challenge the traditional view of closed ecosystems free of human interference attaining or moving toward an equilibrium state. Instead they view ‘ever-changing non-equilibrium’ states as the norm due to the influence of key variables outside the system boundary i.e. climatic factors. This has major implications for CPT; an equilibrium approach which considers human intervention as the most significant external variable. In the new ecology view the correlation between fishing effort and the re-generative capacity of the ecosystem – and therefore the predictive value of CPT - is less clear due to the uncertain impact of abiotic variables. This in turn reduces the role for detailed fisheries regulation in certain systems i.e. especially those with a chaotic, seasonal or inter-annual variation. Further more such variability is likely to be much more characteristic of tropical (e.g. flood plain ‘pulse’ fisheries, seasonal reservoirs, lakes) than the temperate fisheries for which most of the models were developed.

Nevertheless the short-comings of CPT cited by the co-management school overlook the fact that it is an analytical model with empirical relevance only when/ if its underlying assumptions are correct. Although its utility as an analytical tool is well demonstrated, the fact that both schools often continue to treat it as an empirical model has often confused and limited the wider scope of the debate.

Jul-Larsen et al (*ibid*) contend that such distraction has resulted in the neglect of key ‘real-life’ empirical features of fisheries commons – most critically the complex causes and consequences of changes in fishing effort. They suggest

where fisheries are viewed as closed systems; increased fishing effort is often over-simplistically correlated with economic or demographic growth. Broader livelihood based perspectives indicate that effort changes are likely to be more dynamic than visions of a Malthusian 'last resort' would suggest (Pauly 1994). Small-scale artisanal fisheries instead frequently act as economic buffer zones with a constant flux out as well as into the sector as opportunities arise in other sectors of the formal or informal economy. Furthermore fisheries often exist as part of a package of diversified livelihood options, concurrent or simultaneous, which the poor constantly juggle to manage risk. Such 'pluriactivity' is especially characteristic of those living in marginal, resource poor or other vulnerable environments for example, fisherman and farmers living on flood plains. Only such a broad context allows us to appreciate the degree of dependency and therefore the extent to which the poor are likely to prioritise fishing as a livelihood activity.

## CO-MANAGEMENT OR NO-MANAGEMENT IN SRI LANKA?

In the second section of this paper, some of the ideas developed above are used to address the case for co-management of commercial reservoir fisheries in the Dry-Zone of Sri Lanka. Findings are based on market research conducted in N.W Province by the author during a 21 month period from 2000 and 2001 (Murray et al 2001).

Following their introduction in the early 1950's, tilapias rapidly colonised most of the country's fresh and brackish water resources, stimulating the growth of what has essentially become a single-species, single-gear (gill-net) artisanal fishery. Today commercial production of tilapias from perennial reservoirs typically amounts to 80-95% of total volume. Most of this production is locally marketed in fresh form by diffuse networks of two-wheeler vendors, while urban demand is predominantly catered for with marine fish supplied by a cold chain. Cheaper small marine varieties such as sardines also augment rural consumption during seasonal periods of lean inland production. Nationally, fresh and dried fish constitutes 65-70% of total animal protein intake rising to as much as 85% in rural areas (NARA 1999, Nathaniel & Silva 1998). Given the economic geography of this production base, it is reasonable to assume that the rise of the tilapia fishery, which accompanied large-scale reservoir rehabilitation, was a key factor facilitating repopulation of the Dry-Zone in the post-independence era.

Fig 2 shows the distribution of small and medium size perennial reservoirs supporting commercial fisheries (>200 – 2,858ha) in the research area. The high storage density combined with a relatively high rural population density (>290 persons/ km<sup>2</sup>) means that most production is marketed fresh, within a 30-40 mile radius around multiple landing points (Plate 1) reaching even the most remote settlements.

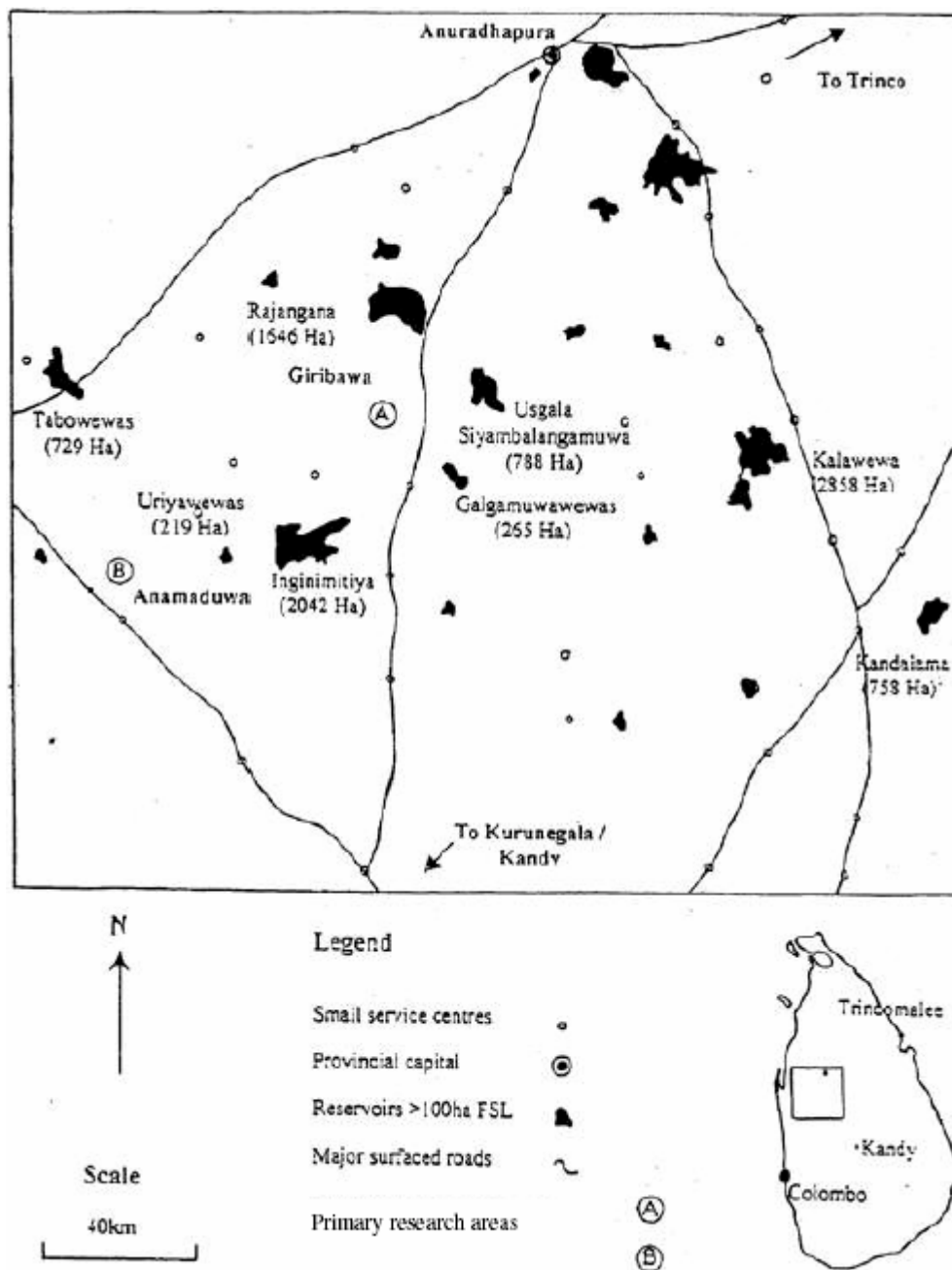


Figure 2. Location of reservoirs with commercial fisheries in the research area, N.W Province Sri Lanka (Murray 2004)



Plate 1 Bicycle vendors purchase tilapia from a landing site on Rajangana reservoir at first light (note wire mesh keep cage (R) and single outside carp (C) in catch)

Detailed longitudinal market research focussed on fresh fish sales in Galgamuwa town, a small administrative and agrarian service centre (Population 14,680 – GOSL 2000) located close to Usgala Siyambalangamuwa (788ha) and Rajangana (1646ha) reservoirs (Fig 1). Most of its inland fish supply originates from these two sources. Volume and price information for inland fish and its principle substitutes was collected on weekly basis between January 2000 and September 2001. Main outlets were a busy junction for inland fish (Fig 2) and periodic roadside stalls for marine and occasionally inland fish.



Plate 2. Cartel of 2-wheeler vendors selling inland fish at Galgamuwa junction

Purely by chance, this research period coincided with attempts by the Ministry of Fisheries and Aquaculture Resource Development (MOFARD) to re-

establish functional fishing co-operatives through co-management interventions. Most of these institutions had effectively collapsed after a politically motivated selective withdrawal of Government financial support to the inland fisheries and freshwater aquaculture sectors from 1989 to 1994.

No reliable official statistics were collected during this period (here-after referred to as the 'ban'), however anecdotal evidence points to increased effort resulting from rising numbers of unregulated casual entrants 'down-fishing' with progressively smaller mesh sizes and intensive methods. The great majority of participants could be characterised as fisherman-farmers, relatively recently diversified into fishing. Only in Rajangane was there a group of specialised fishermen; low-caste (kawara), encroached / landless Christians – of coastal origin. Most observers contend that the inland 'ban' was politically influenced by a desire to deter this low status group from settling permanently in the 'Buddhist hinterland'. As professional marine fishers, they were the first to recognise the commercial potential of the emergent tilapia fishery. At the same time the clear economic imperative presented by the new fishery encouraged the higher-caste farmer group to accommodate and ultimately normalise the practice of commercial gill-net fishing. Even as they retained a traditional taboo on subsistence level fishing using hook and line gears in smaller seasonal tanks (village reservoirs) as low status 'pity work' (Murray 2004).

This trend reflects a frequent occurrence whereby non-traditional fishers move into established fishing grounds of professional artisanal fishers as effort intensifies. The distinctive feature here was the weak informal access rights associated with transhumance livelihood strategies of the 'coastal-inland' fishermen's, as well as their lack of political patronage. Consequently, for the most part they were easily displaced by landed riparian new-comers. The few communities that remained can often be found in semi-permanent settlements illegally encroached in 'protected' forested watershed areas.

Fishing restrictions form the main plank of most co-management strategies and here too the main commitment of MOFARD was to support their implementation and enforcement. The management goal of the restrictions was to sustain or increase yields while adding value through increased mean catch size. Their precise design was based on lengthy consultations between government fisheries officers and the memberships of registered fishermen's co-operatives; 3 in the larger Rajangana and 1 in Usgala reservoir. This included meetings with the entire co-operative memberships and in the case of Rajangana follow-up meetings to broker consensus between the 3 different societies.

In both reservoirs it was agreed to restrict the use of undersize nets (<7.6cm stretched mesh size) as well as highly efficient gears (beach seines, mono-filament and sandwich 'trammel' gill nets) and intensive active-fishing practices know as 'beating'. In Usgala a majority of members requested the imposition of an additional ban on night fishing in order to reduce poaching from gears set to fish passively overnight. This resulted in wastage of fish which perished in the gears early in the night and more seriously conflicts associated with the practice of poaching and damage to competitors' nets under cover of darkness. This was implemented by locking boats up between sunset and sunrise. The consultations demonstrated that the majority of

fishermen were highly supportive of the need for reforms but felt that fishing restrictions would only be effective with external support to help enforce them.

The consequences of the fishing restrictions which commenced in December 2000 could be clearly observed in market trends for inland fish and its substitutes recorded in Galgamuwa Town.

For the first 12 months, similar volumes of fresh inland and marine species were available in Galgamuwa (Fig. 3) with relatively modest and predictable seasonal fluctuations in supply and price. This changed dramatically after the imposition of restrictions. An immediate and sharp fall in yields of medium and small size tilapia (<175g) was the first consequence (Fig. 4). These lower cost, size classes had hitherto constituted the bulk of product reaching remote villages and a smaller but significant component of the town's retail turnover. The deficit was compounded during February and March when priority for the remaining catch was given to feeding agricultural labourers harvesting the main paddy crop cultivated under the same reservoirs. Inland fish prices reached their maximum levels during this period of deficit which lasted from January to May 2001.

This prompted opportunistic marine traders to substantially increase the amount of marine fish coming to market with three new stalls commencing daily operation to cope with the demand. This catered for retail demand in the town, but the greatest volumes were for wholesale distribution through bicycle networks supplying surrounding villages, now with negligible access to their primary source of inland supply. Most of this volume consisted of sardines (72.3% of entire marine sales) which were fortuitously in plentiful seasonal supply during the period of restriction. The low prices of these varieties made them almost perfect substitutes for small tilapias (Fig. 3 - their high cross-elasticity of demand is only impeded by inferior quality perceptions associated with iced fish).

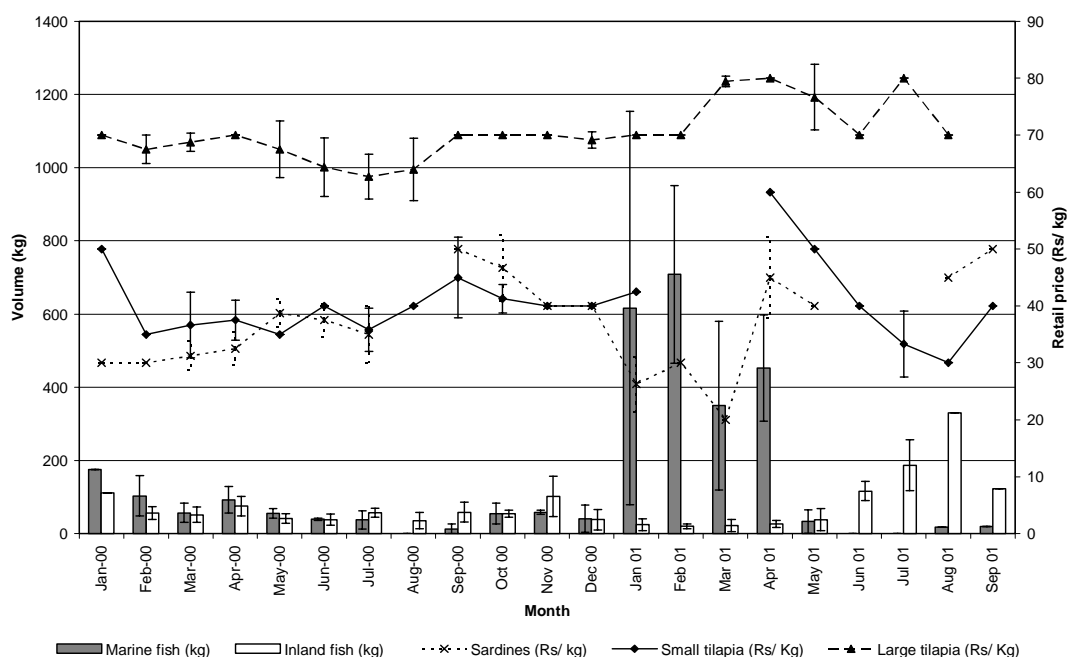




Figure 3 Mean daily volumes of fresh inland and marine fish and mean monthly retail prices for selected varieties in Galgamuwa town NWP 2000-2001 (standard deviations indicated)

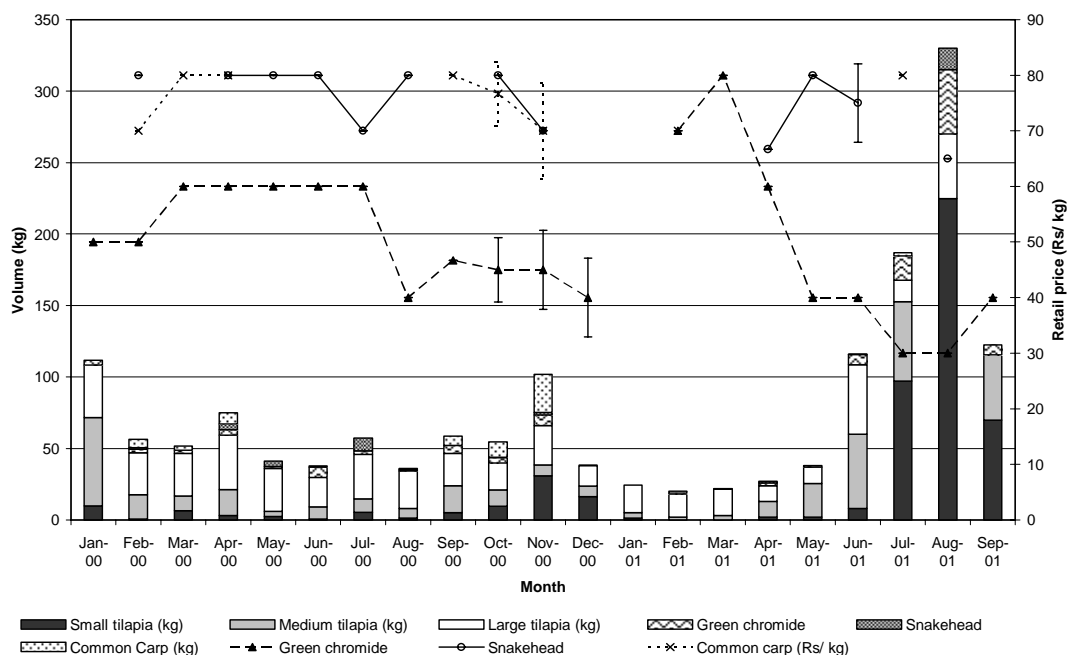


Figure 5. Mean total daily volumes for principle fresh inland fish varieties and mean monthly retail prices for selected varieties in Galgamuwa town NWP 2000-2001 (price standard deviations indicated)

After a period of rigorous compliance the restrictions began to break down and once free-riding commenced the complete break-down of rules ensued rapidly; first in Rajangana reservoir and subsequently and more progressively in Usgala. In the first instance conflicts between the different co-operatives occurred when the gears of the *kawara* group who had extended their informally accepted fishing range (for want of alternative income activities), were damaged by a second group. In Usgala the breakdown was internal to the single group and commenced with the resumption of night fishing by a small number of individuals. The incentive to free-ride was enhanced by dramatic yield reductions in the short-term, indicating that a more progressive system of restrictions may have been more sustainable. In this respect, the uniform adoption of a ban on small-mesh gillnets <7.6cm, (the prevailing though rarely observed legal limit), suggests that the outcomes of the consultation process were to some extent pre-determined by MOFARD to comply with national statutes.

Attempts by the co-operatives to resolve the conflicts failed as no effective external enforcement mechanism was available. This was despite the good intentions of local fisheries officers who were few in number and lacked resources (e.g. officers frequently relied on public transport to visit reservoir sites). There was also a lack of co-operation between different government agencies and political patronage was offered to influential free-riders.

By June 2001 intensive fishing practices had resumed in both locations with production levels rebounding to the highest levels and lowest prices observed during the survey period. Total volume reached over 330kg per day consisting

mainly of smaller tilapias whose price fell to Rs30/ kg during August 2001. Marine supplies immediately fell as a consequence – with the same stallholders moving to trade surplus tilapia while the glut lasted. This surge in productivity, which was well above the usual seasonal dry-season increase in CPUE can be attributed to the protection given to younger cohorts during the effective period of fishing restriction.

The intensive gillnet fishery has undoubtedly had negative secondary impacts on indigenous biodiversity; once commercially significant minor cyprinids such as *Labeo porcellus*, *L. dussumieri* and *Puntius sarana* are now at the edge of consumer memory. However the rapid total yield recovery demonstrates the outstanding resilience of tilapia stocks to the same pressure and explains their increasing contribution to total catches. This is attributable to tilapia's r-selected ecological traits which include: high fecundity; small size; short generation time; and the ability to disperse offspring widely. Such traits confer advantages in unstable or unpredictable environments, exemplified in this instance by wide hydrological fluctuations associated with periods of intense fishing effort. The ability to reproduce quickly at small size is especially crucial in this context. Tilapias can breed at sizes well below 20g, will reach sexual maturity after only 6 months and breed much more evenly throughout the year than other indigenous and exotic carps whose reproductive behaviour is tied more closely to the monsoonal cycle. Therefore even in an intensive open access fishery, a highly responsive dynamic equilibrium is likely to operate as participants move in and out of the fishery in response to yield variations. Although CPUE levels were not evaluated in these commercial fisheries, subsistence fishermen harvesting seasonal tanks in the same area rarely extended fishing activity at levels below 0.5kg/hr (Murray 2004).

It would be instructive to test the generality of this thesis against official inland catch statistics. Unfortunately, such statistics are extremely sensitive to monitoring capacity which was all but absent during the 'ban' and remains weak. Yet they are still an important basis for formulation of fisheries management policy so will be considered briefly. The period of the 'ban' is of particular interest – as it was effectively a reverse of the current case study – deregulation followed by an attempt to restore management systems. Available statistics (Fig. 5) suggest a dramatic crash (1989) followed by a steep rebound in freshwater yields after withdrawal of the 'ban' (1994) whereas an immediate surge in production would be a much more likely consequence of de-regulation. This is supported by results from a scientific case-study of 5 reservoirs (Amerasinghe 1999) which detected a decrease in mean landing sizes for the two dominant species of tilapia in the fishery shortly after the 'ban'.

Regardless of provenance, the official figures have been used to support resumption of some 'pre-ban' (1980's) intervention strategies which attract sizeable bilateral grant or loan support e.g. culture based-stocking enhancements. Low recovery rates of stocked fish, particularly in larger perennial water (>700ha Amarasinghe 1988) have resulted in a shift of focus to smaller perennial and semi-seasonal water bodies. However, here too, little evidence exists to suggest sustained community involvement or incentive for private sector seed provision (Murray 2001).

The largest surge in reported production during the late 1980's correlates more closely with state rather than private sector investment. Heavily subsidised gears (fibre-glass out-rigger canoes and gill-nets) were provided by the government from 1979 onwards (Amarasinghe 1999). This also had institutional consequences. Funds were to be channelled exclusively through newly established fisheries co-operative societies providing an incentive for almost all fishermen operating in the country's perennial reservoirs to register for membership (Amarasinghe *ibid*). MOFARD then implemented management policies through these institutions. This client-focused arrangement suggests that local resource users had negligible institutional leverage to demand downward accountability and decentralisation of decision-making processes from MOFARD. Even where real political will to decentralised governance exists – such institutional leverage is a key feature of sustainable co-management options.

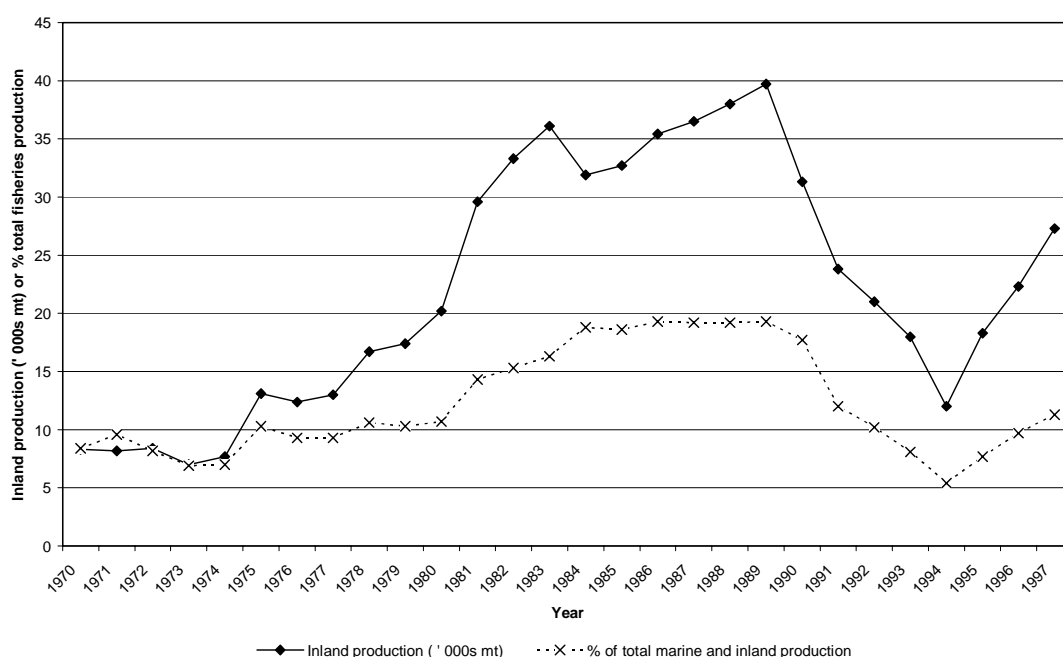


Figure 5. Inland fish production in Sri Lanka 1970-1997 (source NARA Fisheries Year Book 1998)

Commodity price indices offer a more reliable means of evaluating the balance between population-driven increases in demand and available supply (Fig 6). Between 1992 and 1998, the retail price of tilapia rose almost in parity with inflation which averaged 12.2% per annum equivalent to a compound rate of 103% over the same 7 years (Central Bank 1998). This historic stability also points to the resilient regenerative capacity of the fishery and suggests fears of over-exploitation are unfounded despite anecdotal reports of decreases in individual fisher yields. Such resilience together with the highly segmented demand for inland fish (i.e. predominantly rural) is also the main reason for the lack of an economically viable inland food-fish aquaculture sector in Sri Lanka – yet kick-starting this sector also remains a key tenet underlying technical assistance grants solicited by the state.

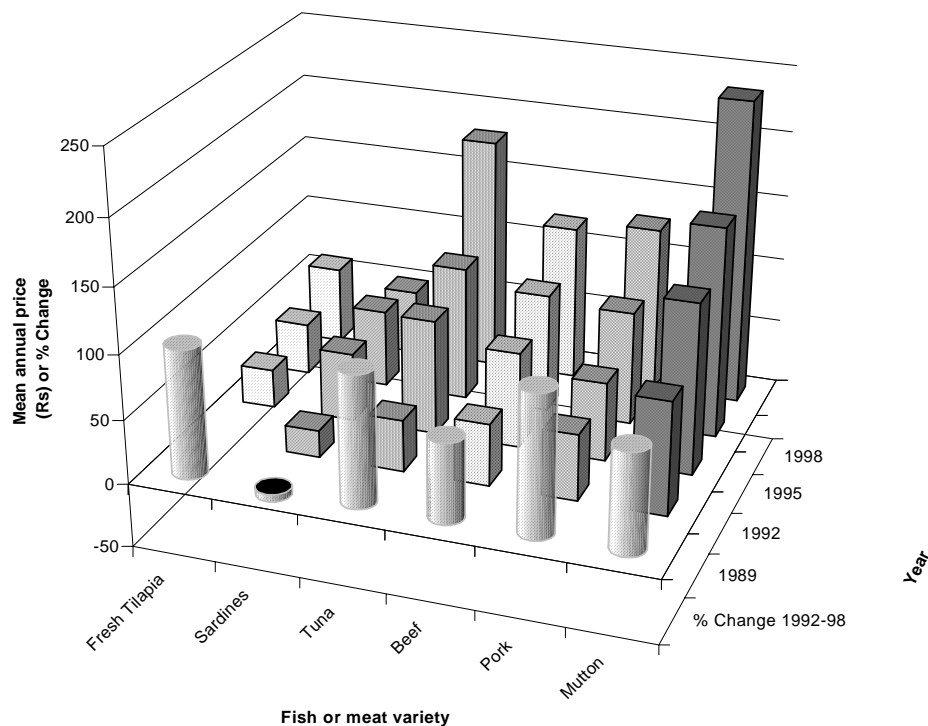


Figure 6. Historic trends in fresh fish and meat substitute retail prices, Colombo 1989-1999 (Data Source ARTI 1988). Note: round bars = total % increase in retail price over the 7 year period.

Findings from this research bear some striking parallels with those of Jul-Larsen et al (*ibid*) on SADC small and medium-scale lake fisheries; particularly with regard to their caution against over-reliance on classical management theory emphasis on limiting numbers of fishermen and uncritical application of co-management strategies.

In both studies fishing intensification resulted mainly from increasing numbers of fishers over and above investment or technology driven change (e.g. more efficient gears). Furthermore, environmental rather than economic factors appear to be the predominant causal factors underlying this change. The regenerative resilience of the tilapia fishery, the principle environmental driver was considered above. The economic drivers of intensification are assessed in the remaining part of the text.

The incentive for external investment driven growth is limited due to the fact that the market already equates closely to the elusive assumptions of 'perfect competition' underlying micro-economic demand and supply theory i.e. there exists (1) a highly homogeneous quality fresh product, (2) free access to market information associated with localised demand (3) all actors are price-takers (4) only 'normal' profits are available resulting in highly equitable value chain margins and (5) low trading overheads in dispersed rural markets for inland fish promote free entry in and out of the market.

These factors also help explain the persistence of low-tech production and distribution networks (canoes, gill-nets and bicycles) with low reliance on external inputs e.g. fuel or refrigeration costs. This is in marked contrast to the marine and other agricultural sectors where availability of scale-economies (e.g. bulking-opportunities) and provision of costly external inputs are closely associated with tied-marketing contracts and long-term credit and other service provision by a relatively small number of external agents with access to investment capital. In the inland sector, such transactions are for the most part highly localised, small-scale and take place mainly on an informal relational basis directly between producers and one or more vendors.

Such features effectively insulate the inland fishery from external 'shocks' experienced in the wider liberalizing economy e.g. policy fluctuations on state market interventions, input/ output subsidies, volatile energy and agrochemical prices etc. For example, technology driven intensification in the marine sector followed by increasing fuel prices drove many artisanal motorised day-boats from the inshore sector prior to the tsunami (Kelegama 1999). Viewed in this 'vulnerability context' – the resilience (see below) and distributive equitability of the inland sector clearly makes it directly and indirectly, a vital safety-net to large numbers of the rural poor: producers, market intermediaries and consumers. From a policy perspective in this sector at least, a precautionary approach should be taken to promotion of external investment driven growth; for example through attempts to promote urban consumption of inland fish to promote an aquaculture sector. Such attempts are anyway unlikely to have much realistic chance of success given the current configuration of robust fishery and segmented consumer demand.

Social differentiation between resource users was a further key-feature of the current study. Only the full-time low-caste (kawara) fishermen could be considered users of the last resort and consequently, it was they who were the first to be driven to significant levels of opportunistic free-riding behaviour. By contrast the great majority of landed fishermen-farmers with more diversified livelihood portfolios relied on fishing more as an economic-buffer than a sole-income provider. This relative economic mobility undoubtedly enhanced their propensity to comply with sanctions, added to which the main period of the sanctions also coincided with the busiest season in the agricultural calendar.

The current case study not only demonstrates a failure of the planned co-management strategy – but also raises serious questions regarding its wider applicability as a governance reform in the specific environmental and socio-economic context of the Dry-Zone reservoir fishery. Firstly there is a lack of clear evidence that productivity gains would justify the additional institutional transaction costs given the highly regenerative capacity of the tilapia fishery. Secondly in the absence of effective enforcement, restrictions on smaller sized catches are likely to have disproportionately adverse effects on the poorest groups in the market chain including remote consumers. Furthermore significant private-sector investment driven growth is unlikely given the current market configuration whereby simple fishing methods with lower CPUE are likely to prevail over more capital intensive technologies. In this context it seems evident that the bipolar management framework (Fig 1) should be expanded to incorporate a more laissez-faire or 'no-management' approach.

## RELEVANCE OF FINDINGS TO BANGLADESH FLOODPLAIN FISHERIES

These findings also point to useful comparative lessons with other resource settings – especially where there is comparable reliance on inland fish as a provider of high-quality dietary protein. For example, population-driven intensification in Bangladesh floodplain fisheries has also resulted in catch composition moving towards small and fast maturing species low in the food chain. Self-recruiting r-selected exotics such as tilapia (first introduced here too in the 1950's) are likely to become more significant in wild catches though environmental conditions are far less favourable for tilapia than in Sri Lankan reservoirs. Inland fishery yields have declined dramatically over recent decades contributing to the emergence of a rapidly growing and diversifying aquaculture sector which today constitutes some 30% of a total annual fisheries yield of 1,400,000 mt (De Graaf and Latif 2006). This trend seems set to continue and seems to be the most realistic means of securing the country's future fish needs (Gregory *et al* 2007). Yet such intensification inevitably demands higher investment security including secure property rights, which, in turn is likely to drive increased privatisation and enclosure of seasonal floodplain commons. Given the traditional reliance of large numbers of functionally land-less farmers and fishermen on such shared aquatic resources, there appears to be a compelling role for co-management approaches within development policy. These approaches may have potential for application within the stagnating fishery and emergent aquaculture sectors (see below).

Co-management enabling factors include the wide availability of NGO sponsored micro-credit and improving access to relatively un-segmented (compared to Sri Lanka) local and regional markets and a favourable policy environment. Constraints to community-based fisheries management (CBFM) include: complex social relations, weak public-sector capacity for longer-term institutional support, insecure and overlapping access rights, to floodplain resources, rent seeking by local elites, competing land-uses, competing off-farm employment opportunities (including aquaculture!) and uncertain returns to effort.

In terms of economic sustainability at least, aquaculture based co-management systems appear to have demonstrated greater promise than CBFM models, most of which remain pilot initiatives strongly supported by donor projects. Two recent examples of the former approach are predicated on the pooling and enclosure of private lands under seasonal floodplains for semi-intensive aquaculture. The first, developed by Worldfish and the local NGO, Proshika (Dey and Prein 2005) relies on temporary enclosure (fencing which also permits ingress of small wild fish) culture-based stocking and feeding. The so-called Daudkandi model, named after its area of origin near Comilla and originated by the NGO SHISUK, is a more intensive model requiring higher investment in earthen dykes which extend the inundation period.

The models also have markedly different institutional frameworks with consequences for poverty-impact (this is highly significant since both models

exclude traditional fishers from their communal fishing grounds). The first relies on traditional NGO advocacy to support inclusion of the landless-poor as labourers. Unfortunately such transaction costs are rarely acknowledged or fully-costed, raising serious doubts over their sustained inclusion once external support is withdrawn. The Daudkandi model is a more novel joint-venture co-operative model incorporating low-cost micro-credit share options for poorer community members. The NGO also engages as an active share-holding partner committing them to a longer term presence and there is clear evidence of sustained positive impacts on local economies including employment and service opportunities for the poor, nutritional benefits and higher interim rice yields.

Nevertheless, here too questions remain regarding potential for longer-term elite capture (Gregory et al 2007). SHISUK are currently testing the model in perennial beels (shallow floodplain lakes - with fisheries under public ownership) where many CBFM models have been applied with limited evidence of sustainable adoption.

In conclusion co-management projects are likely to fail if they ignore contextual issues which influence the propensity of the individual to participate in mutually beneficial collective actions. Despite claims to the contrary, no effective blueprint approaches exist. Instead adaptive approaches are required. The observations presented here underscore the importance of moving beyond the view of a closed system to placement of fisheries within their wider environmental, social and economic context.

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Conference Paper 12



## Fisheries Co-Management: the Zambian Experience

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## ABSTRACT

Since the late 1980's various forms of fisheries co-management initiatives have been implemented in some of the major fisheries in Zambia. The reasons for instituting co-management arrangements have been varied and have ranged from the need to control the influx of immigrant fishermen to the desire to encourage the use of legal fishing gear. This paper looks at the manner that co-management has evolved in three fisheries namely Lake Kariba, Lake Bangweulu and the Mweru-Luapula fisheries. It shows that after more than 10 years of co-management the results are still mixed. On one lake there is some form of co-management while on the other two these initiatives have not been very successful.

## INTRODUCTION

For more than fifteen years now Zambia has instituted policies that seek to decentralise the management of natural resources from the centre to the users in various Community-Based Natural Resource Management (CBNRM) initiatives. In the face of increased poverty especially in the rural areas, these policies seek to place priority on the utilisation of resources to previously marginalised communities so as to achieve sustainability and improve livelihoods.

In Zambia, the National Environmental Action Plan (NEAP) of 1994 sets the broad framework for CBNRM in the country. The NEAP was founded on the principle that local communities and the private sector should participate in natural resources management (Government of the Republic of Zambia, 1994). This was intended to consolidate the gains made in the management of resources especially wildlife in a context of declining government expenditure.

The Administrative Management Design for Game Management Areas (ADMAGE) in the wildlife sector is premised on the transferring of responsibilities and benefits of managing wildlife to rural communities. In 1999 the Wildlife Act was amended making local communities have legal rights over wildlife resources (Mwenya et al. 1990). The purpose of this paper is to explore how the decentralisation of management roles to users has fared within the fisheries sector. The paper will use examples from three fisheries namely Lake Mweru/Luapula, Lake Bangweulu and Lake Kariba to show how co-management was instituted and the current status of these efforts.

## FISHERIES SECTOR IN ZAMBIA

About 7% or 53,700 km<sup>2</sup> of Zambia's surface area is covered by water setting the stage for a thriving fishing industry in the country. These water bodies produce between 65,000 to 70,000 tonnes of fish annually. These figures do not, however, include production for subsistence purposes which is quite substantial. The fisheries sector in the country accounts for about 3% of the Gross Domestic Product and the industry is the third largest employer.

Despite these production figures the per capita supply of fish has declined from 12 kg/year in 1985 to 7kg/year in 2000 (MACO, 2002). The decrease in consumption rates has been attributed to the increasing population which has put pressure on fish stocks leading to unsustainable fishing habits and subsequent declines in catches.

The fish production figures account for about 3% of the country's Gross Domestic Product (GDP). Given that fish products are among the lowest-priced source of animal proteins consumption has tended to increase with declining incomes. According to a 1998 survey the proportion of fish to household food expenditure increased from a low of 5.5% in 1993 to a high of 7% in 1998. The highest level was however reached in 1996 when fish accounted for 12% of household purchases of food (MACO, 2002). The survey further shows that fish consumption increased considerably in rural areas where there are significant water-bodies such as Luapula, Northern, and Western Provinces. This can be attributed to the increase in the number of people taking up fishing as the formal economy contracted during the period (Jul-Larsen et al, 2003). The 12% figure of animal protein obtained from fish in Zambia is low when compared to other land-locked Sub-Saharan countries such as Malawi and Uganda where fish contributes about 38% and 30% respectively towards the protein needs of households (Bèné and Heck, 2005).

The low fish production figures in Zambia belie the existing potential that exists in the fisheries and aquaculture sector. The potential of making this sector one of the main weapons in poverty-alleviation and improved nutrition is immense. The country has three major basins where most of the country's fisheries are located. These are the Zambezi, Luapula and Tanganyika Basins. They support fisheries in Lakes Mweru, Bangweulu, and Luapula. The Zambezi catchment supports the Luangwa, Lukanga, Kafue and Zambezi River fisheries. These fisheries are exploited by mostly small-scale fishermen rather than commercial and highly organised units. Most of the craft used are canoes propelled by hand with a few having mechanised vessels. There are also seasonal streams and rivers which provide fish for subsistence for many people especially in the rural areas.

While total demand for fish is estimated to be in the range of 100,000 metric tonnes per annum, production from capture fisheries has fluctuated between 65,000 and 70,000 tonnes for a variety of reasons. The difference could easily be accounted for through improved aquaculture. However, aquaculture is still a long way off in meeting the balance from capture fisheries. It is estimated that there are currently about 5, 000 aquaculture farmers in the country. Less than ten of these farmers can be classified as being commercial (MACO, 2002). Production in the aquaculture sector rose from 88.5 metric tonnes in 1967 to about 700 metric tonnes by 1982. 2002 estimates put the figure at 10,000 tonnes (MACO, 2002). Most of the fish farmers are concentrated in the Eastern, Northern and North Western Provinces. Production is constrained by a number of factors such as the non-availability of a legal framework in which to operate; poor institutional arrangements; lack of quality fingerlings and feeds and shortage of experienced extension staff.

## MANAGEMENT OF THE FISHERIES SECTOR

By law the Department of Fisheries (DoF) in the Ministry of Agriculture and Cooperatives is responsible for the management of the country's fisheries. This mandate is contained in the Fisheries Act of 1974. Owing to inadequate resources and lack of attention at policy level, the DoF offers only a token presence in most of the fisheries. However, one of its most visible presences is the enforcement of the annual closed season which takes place December and March. During this period DoF staffs undertake joint operations with other law-enforcement agencies to confiscate gear and apprehend fishers who are found to be found fishing during the closed season.

Another layer of management over the country's fisheries is that of traditional authorities. During colonial rule local administrative structures known as Native Authorities (NA) were funded through natural resources. Through the NA's the chiefs were allowed to impose levies and licences for the harvesting of natural resources such as fish. These levies became an important source of revenue for running these local areas. Although Native Authorities were abolished after the country's independence in 1964 Traditional Authorities have maintained some leverage over the management of fisheries resources. In the process this has led to conflicts with other users of the resources (Wilson et al, 2004).

Most of the management roles that were given to Traditional Authorities during the colonial era were transferred to Local Authorities in the post-independence period. Consequently, today the Local Authorities obtain part of their revenue from fish. This is normally calculated on the amount of fish that a trader is carrying out of a given fishery. Apart from collecting the levy the Local Authorities do not play any other part in fisheries management.

## EMERGENCE OF CO-MANAGEMENT ON LAKE MWERU/LUAPULA

The Mweru-Luapula fishery is in the northern part of Zambia in Luapula Province on the border between Zambia and the Democratic Republic of Congo. It is divided into two Systems. Lake Mweru proper starting from the Luapula River mouth to Luvua River in the north and is approximately 110 km long and 40-50km wide. Its depth varies from 2 m. in the south to 27m in the north. Its total area is about 4580 km<sup>2</sup> of which 58% belongs to Zambia. The Luapula River system stretches from Mambilima Falls to the mouth of Luapula River. Below Mambilima Falls, the River forms an extensive swampy flood plain of about 160 km and 5-18 km wide. This swamp system with its numerous oxbows and lagoons is interlinked with the open waters of lake Mweru. Both systems make up Mweru-Luapula Fishery.

Some form of co-management in the fishery was initiated in 1985 and was a reaction to gear thefts. Fishing Associations (FA's) were formed with the main objective of stopping gear thefts but later on they started incorporating fish conservation issues in their agenda. Another objective of FA's was to offer assistance to members in times of hardship such as bereavements.

Membership was only open to fishers although other community members were free to join if they so wished. Interestingly, the FA's were created by fishers who felt a need for them and the DoF did not initially take an active part in their operations.

By 1990 FA's began to experience a number of problems. First, they were poorly funded and could thus not operate effectively. Their main sources of funds were subscriptions from members and sometime this was given on a voluntary basis. Secondly, they did not receive the required support from the government in general and the DoF in particular. The police for instance, considered them to be a vigilante outfit which was operating outside the country's laws. Thirdly, they were also resisted by the Traditional Authorities who felt threatened by their presence. Fourthly, most of the members of the FA's were also farmers such that at certain times of the year they would abandon their fishing activities to go into farming. During such periods they FA's would remain inactive leading to frustrations for those who remained in the fisheries.

In 1992 the DoF instituted what they called the Conservation and Management Action Programme (CAMAP) with funding from a donor agency. The objective of CAMAP was to promote 'conservation dialogue' in the fishery. By 1994 CAMAP had managed to convince most of the fishers to protect the breeding areas of fish. However, realising the potential of CAMAP in solving their grievances the fishers began to question the role of local authorities in the fishery. In particular, they questioned the collection of fish-levies which were not ploughed back into the activities of CAMAP but were instead used for other purposes such as paying wages for local authority staff. The local authorities resisted these attempts on the grounds that they were mandated by law to enact by-laws which empowered them to collect fish-levies.

By 2000 the CAMAP concept began to face problems. As the lake is shared by the Democratic Republic of Congo (DRC) conservation measures that were being instituted on the Zambian side were not being observed on the other shore line. This began to breed resentment by Zambian fishers who did not see the point of embarking on conservation measures which their DRC counterparts did not respect. Secondly, the Traditional Authorities still felt threatened by these institutions that were not under their control. To this end, they frustrated their operations. In a social survey conducted in 2004 it was revealed that these co-management institutions were still in place in the fishery. The survey further revealed that there was disagreement among fishers on the appropriate role of Traditional Authorities in the management of the fishery but most were agreed that DoF was the appropriate vehicle through which to institute co-management (Wilson et al 2004).

## CO-MANAGEMENT ON LAKE BANGWEULU

Lake Bangweulu is actually a swampy area with few lakes. The fishery contributes about 20% towards the country's total fish production (Til and Banda, nd). Although most of the actual fishing is done by men, there is large

number of women involved in fishing for subsistence, processing and fish-trade.

The DoF introduced the concept of co-management in the fishery in 1996 through a donor-funded project. This was initially done by conducting a Participatory Rapid Appraisal to generate dialogue among the diverse actors and create a platform through which to manage the fishery. Later Fish Conservation Committees (FCC's) were formed. However, some of the major actors in the fishery refused to join in the initiative. In particular, the Local Authorities refused to allow the FCC's to collect the levy which was supposed to be used to support co-management at the local level. The co-management process in Lake Bangweulu made a deliberate decision not to involve the Traditional Authorities in their operations.

One major problem, however, was that there was very little capacity within the DoF to carry out co-management activities. The concept was very new in a department whose major role had, hitherto, been that of enforcing fishing regulations. In the end, co-management did not succeed in Lake Bangweulu. Apart from the above the other reasons were that the FCC's were perceived to be male-dominated organs as they did not involve fish processors and traders the majority of whom were women. Secondly, the scattered nature of fishing settlements coupled with rapid migration of people to and from the fishery was a hindrance to the smooth operations of the FCC. Today, the FCC's are no longer in place in Bangweulu and there is no co-management taking place.

## CO-MANAGEMENT ON LAKE KARIBA

The introduction of co-management on Lake Kariba came about due to a combination of several factors and dynamics in the fishery. Like in Lakes Mweru/Luapula and Bangweulu the concept was introduced by DoF through a donor-funded project. While the role of Traditional Authorities in the two other fisheries was rather ambiguous, on Lake Kariba co-management was initiated partly to make these institutions more active. It was noted that there were post-colonial changes that had reduced the role of traditional authorities in management. In turn, this had engendered the unrestricted entry of immigrants from other regions of the country into the fishery. Concomitantly, this had led to an increase in the use of illegal fishing methods and the setting-up of settlements anywhere along the lake shore and on islands (Chipungu and Moinnudin, 1994). Furthermore, scattered fishing camps in the fishery made it difficult for DoF not only to collect accurate statistics on yields but also to monitor the violations of fishing regulations.

The new co-management arrangements led to the setting-up of designated fishing settlements on the lake shore and to delegate to the artisanal fishers responsibilities and authority to control and manage particular fishing grounds. In this manner the artisanal fishermen would then control access and enforce fishing regulations in those fishing grounds. Another secondary benefit of this co-management arrangement was that other actors in the fishery such as the



local authority would find it easier to provide the necessary social services to fishermen's households such as schools and health facilities.

For management purposes the shore line was divided into 4 zones. These zones were to be an area of the lake and the mainland falling under the jurisdiction of a local Traditional Authority. These zones are administered by Zonal Management Committee's (ZMC's) which comprise of a Traditional Authority in that particular zone, a local authority representative, a DoF official, four fishers a representative of NGO's operating in that zone and two businessmen 'with well established businesses' (Chipungu and Moinnudin, 1994: 5). The roles of the ZMC's are to co-ordinate the activities of fishing camps under their zones. They are also responsible for monitoring fishing regulations. In each fishing camp and below the ZMC's there are Integrated Village Management Committees (IVMC's). The IVMC's comprise of an elected chairman from among the artisanal fishers in that camp, three elected ordinary members, a village headman, a Fisheries Assistant and a Village Scout appointed by the DoF. The IVMC's have the task of controlling access to the fishery by vetting new entrants. Fishermen from other fisheries or from other fishing camps within Lake Kariba have to be vetted by an IVMC before they can start fishing. In addition, the committees are also going to be responsible for enforcing and monitoring fishing regulations. The Fisheries Assistants and the Village Scouts in the committees were to be primarily responsible for the enforcement of fishing regulations.

Initially, these new arrangements led to a number of conflicts among the various actors involved. There were conflicts between the largely immigrants fishers and local people. Due to fluctuations in catches it is imperative that fisher have access to land for agricultural purposes. The local people resisted the idea of sharing their agricultural land with immigrants whom they considered to be 'foreigners.' Secondly, the local authority refused to surrender the revenue from fish levies to the ZMC's on the grounds that these institutions did not have a legal backing. Indeed, the Fisheries Act does not recognise the institutions that have been created to promote co-management. Efforts have been made since 1994 to have the act amended but these have stalled. As a compromise the ZMC's were registered as associations and are still operational. The ZMC's have become so self-reliant that they even able to fund DoF officials to their annual meetings (Malasha, 2003).

## ISSUES FOR CO-MANAGEMENT IN ZAMBIA

As the above examples have shown, co-management in Zambia has to contend with a lot of factors. First, there are overlapping layers of management in the country's fisheries, and each layer has its own source of legitimacy and relevance. While the DoF is legally in charge of management, the traditional and local Authorities all have a claim in one way or another on these fisheries. In the Lake Mweru/Luapula fisheries the local chiefs have their personal lagoons which are not subject to the Fisheries Act such as the closed season.

Secondly, there is currently a legal vacuum in the country in terms of co-management. While CBNRM arrangements in other natural resources such as forests, water and wildlife are backed by legal provisions, this is not the case within the fisheries sector. Efforts to revise the Fisheries Act of 1974 to recognise co-management arrangements have not succeeded to date. Thirdly, there is institutional weakness at the DoF level. The department is located in a ministry whose main focus is crop production.

Consequently, policy matters related to the industry are not given the priority that they require notwithstanding the fact that the sector is the fourth largest employer in the country. Fourthly, the migration of people from the fishery into agriculture and vice versa has an effect on the management of the fishery. Data has shown that most people will be engaged in fishing and other livelihood activities at the same or at different times (Jul-Larsen et al, 2003). This fact of life among fishers needs to receive recognition when implementing co-management activities.

## ROLE OF THE WORLDFISH CENTER IN ZAMBIA

The Zambian WorldFish Center office was opened in June 2006 has now become fully operational. It will be one of the offices mandate to address the issues that have been highlighted in this paper. Already, the office has been invited to provide advice on the strengthening of co-management in Lake Mweru/Luapula fishery. It is anticipated that the use of a model developed by some of the Center staff will greatly assist in designing a management plan that takes into account the various factors that are peculiar to this fishery. Secondly, the Center has also engaged DoF with a view of revising the Fisheries Policy to make it relevant to the current times. In its current form the Fisheries Act still reflects the times when the DoF was seen as the sole manager of the country's fisheries. It is also the Center's objective to increase aquaculture production in the light of stagnating production from most of the country's capture fisheries. Aquaculture would not only increase fish production making it readily available but would also solve some of the current contentious management tools such as the 'closed season.' Already the Center has carried out studies which indicate that aquaculture can be a profitable venture for most of the small scale farmers in the country.

## CONCLUSION

Fisheries co-management in Zambia has had mixed results. While it has not been so successful in some of the fisheries there is some hope that it will succeed in others such as Lake Kariba. A major hindrance has been lack of a legal framework through which co-management can occur. Currently, the institutions for co-management operate in a legal vacuum and are recognised as such at the discretion of other actors and institutions and not because the law requires them to do so. Secondly, fisheries co-management in Zambia has to operate within a context of competing and sometimes conflicting layers of management.

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Conference Paper 13

A horizontal green banner with a light green background. It features silhouettes of people's heads and shoulders on the left and right sides, and a small heart shape in the center.

## Inland Fisheries Co-Management in East Africa

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## ABSTRACT

The importance of inland fisheries resources to the East Africa Community Partner States of Kenya, Tanzania and Uganda is highlighted. Efforts and achievements to improve utilisation and management of fisheries resources for lasting social and economic benefits in the region are examined. Experiences from two projects, the Integrated Lake Management project in Uganda and the on-going implementation of a Fisheries Management Plan project on Lake Victoria are examined. Key achievements are examined and lessons learned for within and beyond the region are identified.

Key words: East African Community, inland fisheries, co-management, governance, LVFO, Lake Victoria,

## INTRODUCTION

The inland fisheries of the East Africa Community (EAC) Partner States of Kenya, Tanzania and Uganda are based predominantly on its major freshwater lakes, the most notable being Lake Victoria, the world's second largest freshwater lake with an area of 68,800 km<sup>2</sup>. Inland fisheries contribute between 2-12% of the GDP in each country and produce fish for domestic and export markets. The value of the catch from Lake Victoria alone is estimated at \$350 million at landing sites with a further \$250 million generated by the export of Nile perch. Other dominant fish species include Nile tilapia, a small indigenous cyprinid (*Rastrineobola argentea*) and various types of catfish. These lake fisheries support the livelihoods of over 3 million people in directly dependent households by providing employment and income and provide high quality food in the form of nutrients and animal protein for millions of consumers in the region.

Rapid increases in human populations have placed increasing pressure on natural resources. In fisheries, this is seen in the considerable increase in the number of people involved in fishing, putting fish stocks under increasing pressure with evidence, in some cases, of stock decline. Additionally, lake waters are subjected to increasing environmental threats from catchment modification such as deforestation, increasing urbanisation, industrialisation, and agricultural expansion. The core problems of increasing human populations and increasingly intensive land-use in lake catchments and shorelines threaten the sustainability of fisheries resources.

Fisheries management institutions in the EAC accept that the traditional centralised, control-and-command approach to fisheries management has failed to safeguard fish resources and the livelihoods of millions of people dependent upon these resources. They therefore adopted a fisheries co-management approach, involving the establishment of legally empowered community organizations called Beach Management Units (BMUs) for planning and management of fisheries resources in partnership with national and local governments. BMUs now provide an opportunity for poor,

marginalised groups such as fishing crew and women to engage in decision-making processes that affect the management of resources upon which their livelihoods are based.

In addition to environmental threats, there is mounting concern over the increasing health threats to fisheries communities caused by HIV/AIDS. Fisheries communities are a major hotspot for HIV/AIDS due to their male-dominated, migratory nature with cash available on a daily basis, limited savings culture, weakening of the normal social norms of a home village, limited recreational opportunities and risky lifestyle. Although there have been recent interventions to increase awareness of communities and promote preventative behaviour, very little assistance has been specifically directed towards fisheries communities in the EAC.

The transition from a centralised to participatory management approach has involved many different initiatives in East Africa in recent years, most of which have been small-scale and a few large-scale. This paper, whilst providing a general description and analysis of the development of inland fisheries co-management in East Africa, draws particular experience from two of the most recent and influential initiatives, the DFID-funded Integrated Lake Management Project (ILM) on Lakes George and Kyoga in Uganda which ended in 2004, and the on-going Implementation of a Fisheries Management Plan project (IFMP) on Lake Victoria, funded by the European Union.

The ILM project ran from 2000 to 2004 and aimed to sustain and improve the livelihoods of poor lake dependent communities through the integrated management of lake resources. The project operated on Lake George (area: 290 km<sup>2</sup>) and Lake Kyoga (area: 2,800 km<sup>2</sup>). The project received annual reviews of progress by the donor and a final independent review. Despite being regarded as a successful flagship project, a request by the project to extend donor support to consolidate the co-management approach and translate institutional achievements into resource based improvements was rejected largely due to the growing donor interest in providing direct budget support. The absence of external donor support to this co-management initiative from 2004 to date, provides an opportunity for valuable lesson learning.

The IFMP project started in April 2003 and is due to end in August 2008 with the possibility of a no-cost extension of up to two years. The aim of the project is to support the LVFO Partner States of Kenya, Tanzania and Uganda in implementing management measures in line with the Lake Victoria Fisheries Management Plan and LVFO Strategic Vision. Lake Victoria being the world's second largest freshwater body, provides an opportunity to examine issues relating to the geographical scale. The project started slowly with an extended start-up phase of 18 months. Its progress accelerated rapidly from October 2004 onwards with support from a newly recruited team of Technical Advisors. The project has received two independent annual reviews and a mid-term review of progress.

The unpinning rationale of the aims of both ILM and IFMP is that improved management of threatened lake resources will lead to a reduction in these threats, a halt in the decline of the resource base, an increase in resource productivity leading to increased benefits for resource dependent people, particularly the poor.

## TARGET BENEFICIARIES

The implementation of a system of co-management for inland fisheries in the EAC has clear poverty reduction aims with direct beneficiaries such as men and women fisheries resource users and their families who are dependent on fisheries for their livelihoods. Of these, the most clearly disadvantaged and poorer groups within communities are the fishing crews and women. These therefore constitute primary targets for poverty reduction and empowerment efforts and make up the large majority (>75%) of the total number of people directly involved in fisheries activities.

Women play a very important role in the post harvest sector through processing and trading but they also have the potential to become more closely associated with fish capture if their role as future boat owners is promoted. There is strong evidence that women must be included as primary beneficiaries if there is to be a positive impact on reducing intra-household poverty.

Since the livelihoods of people in fisheries communities are heavily dependent on the state of fish stocks, these communities have a clear, direct stake in the sustainability of fisheries based on these stocks. The co-management approach has therefore focused on the development of institutional and legal mechanisms to improve fisheries governance through the formation of BMUs to ensure that these stakeholders, particularly the marginalised poor, are able to engage in, and influence decision-making processes relating to fisheries management.

A number of other groups are dependent on fishing and related activities, including boat owners, traders, processors, gear producers and boat builders. These, together with a wider population of fish consumers, are all target beneficiaries who will gain from a more secure resource base and improved facilities and services at fish landings and in associated fisheries communities. There are also other beneficiaries who provide various services to fisheries stakeholders; these include credit providers, shop-keepers and government services involved in the sector.

Principal institutional stakeholders include fisheries departments and research institutes, training institutes and NGOs. These will benefit through either improved physical capacities or enhanced human resource skills, or in some cases through both.

Private industry associated with fish processing and export is also a major stakeholder, including its employees, and one which benefits greatly not only from improved fisheries resources management, fish quality and market

efficiencies but also by being integrated into decision-making management structures.

## ENABLING ENVIRONMENT

Several key factors, ranging from geographical, institutional and political to environmental, social and economic, have positively influenced the development and implementation of a major policy shift towards adopting a fisheries co-management approach in the EAC. These factors are summarised below.

### Geographical

Geographically, Kenya, Tanzania and Uganda are direct neighbours encircling the shared Lake Victoria where the three borders meet at a single point (Fig 1). The lake itself is increasingly becoming a symbol of unity and strong cooperation between the three Partner States. The region also contains other internationally shared lakes with countries bordering the EAC, including lakes Albert and Edward between Uganda and the Democratic Republic of Congo (DRC), Lake Tanganyika between Tanzania, DRC, Zambia, Burundi, Lake Nyasa between Tanzania, Malawi and Mozambique and Lake Turkana between Kenya and Ethiopia. These shared lakes offer the potential for the possible future establishment of regional lake management institutions and geographically wider harmonisation of fisheries co-management approaches and structures. In addition, the coastal States of Kenya and Tanzania provide an opportunity for the spread of co-management structures to marine fisheries.

Fig 1 Map showing Partner States of the East African Community





## **Institutional**

The Republic of Kenya, the Republic of Uganda and the United Republic of Tanzania signed a Treaty for the Establishment of the East African Community in 1999. The formal institutional linkage of these three Partner States of the EAC and the presence of a major shared water body, Lake Victoria, have played a key role in harmonising fisheries policy and legislation both within and beyond the boundary of the lake basin. In November 2006, the Republics of Burundi and Rwanda were admitted to join the EAC. The long-term aim of the EAC is to achieve political, economic social and cultural integration in order to improve the quality of life for people in East Africa through increased competitiveness, value-added production, trade and investments.

On Lake Victoria, the Lake Victoria Basin Commission was recently established to coordinate broad areas of development within the lake basin. Prior to this, the Lake Victoria Fisheries Organisation (LVFO) was formed through a Convention signed in 1994 by the three EAC Partner States out of the need to manage fisheries resources of Lake Victoria in a coordinated manner. The LVFO Convention sets out the structure and functions of the Organisation. The LVFO brings together Heads of national fisheries institutions (management and research) to consult, share ideas and develop harmonised policies, plans and laws not only for Lake Victoria but quite often, nationally. Consequently, a fishery is one of the most closely harmonised of all sectors in EAC and the LVFO is recognised for bringing harmony and efficiency to the very competitive sector of capture fisheries.

The LVFO is the largest and most well known lake management organisation in the EAC. There are, however, other smaller organisations established in different forms in recent years but all basically following an ecosystem management approach. Such organisations are also being considered as possible institutional development options on lakes shared with countries outside the EAC, for example, on lakes Edward, Albert and Tanganyika.

## **Political**

The socialist approach adopted by the national political system in Tanzania provided a broader enabling context for community participation in fisheries management, particularly on Lake Victoria. It is here that the first community fisheries groups known as Beach Management Units were formed. The BMU concept served as a catalyst in developing a fisheries co-management approach in the other Partner States of Kenya and Uganda.

The broad democratic principles of participation, social responsibility, fairness, transparency, accountability and selflessness have been increasingly articulated in national development frameworks, especially in the Poverty Reduction Strategy Papers produced in recent years by each Partner State. The idea of democracy as being not only about political systems, particularly at election times, but also about routine daily life practices, has had a major influence in shaping fisheries institutional development of the grassroots BMUs. During their recent formation or reformation, key fisheries governance concerns about sharing responsibility and powers and setting up decision-

making processes were at the fore of people's attention. In addition, each Partner State was fortunate in having charismatic individuals who served as positive forces for political and policy change at national and local levels.

### **Environmental**

Over recent decades, increasing environmental threats have resulted in both real and perceived negative impacts on fisheries resources and dependent livelihoods. Fishing effort increased dramatically on most lakes, but particularly on Lake Victoria, seen by many as the greatest source of quick revenue generation. With few exceptions, most fisheries are formally open-access with no legal controls in place to prevent entry to fisheries. In addition, harmful, illegal fishing and fish trading practices are widespread putting further pressure on fish stocks. This combination of environmental threats and growing evidence of their negative impacts convinced national authorities that it was time to adopt a new management approach involving communities as partners in management.

### **Economic**

In the late nineties, the EU bans on the Nile perch exports from Lake Victoria had immediate, major adverse impacts on fisheries livelihoods and response to the ban emerged as a significant change event in relation to future community involvement in fisheries management. The marketing bans caused a widespread decline in fish production and a dramatic decrease in many associated businesses at fish landing sites in all three Partner States. In response, the Governments encouraged fishing communities to organise themselves to deter and prevent illegal activities associated with the bans. The communities immediately recognised the need to take action themselves and readily responded to work with Government. Eventually the bans were lifted leaving behind the beginnings of what were to become the Beach Management Units that we see today on Lake Victoria and other lakes in the region.

### **Social**

Without the wish and willingness of communities to engage in a fisheries management partnership with Government, the adoption and spread of the co-management approach would have been impossible. On most lakes, threats were similar and stakeholders expressed concerns for the future fish stocks and their dependent fisheries. The co-management approach offered new hope to effectively address increasing threats.

### **Development Partner Support**

There is clear evidence that the co-management approach would not have been adopted on such a scale and in such a time scale had it not been for support from projects funded largely by development partners. This was, and still is, at a time when the role and future of projects are seriously being questioned and reduced by many development partners and recipient States. The preferred approach to providing developmental assistance now involves centralised budget support, often involving donor basket funding aligned to a

sector wide approach (SWAp) to reduce administration costs and theoretically improve capacity building.

In reality, projects of national and/or regional strategic relevance such as ILM and IFMP provide a very effective and efficient mode of delivery of development assistance with acceptable administrative costs and proven track records of building capacities of both Government and the private sector at many levels. In the case of ILM, this point was clearly highlighted by DFID Advisors in the DFID Annual Review report of ILM, 2003 which stated that "...without the project it is unlikely that advances in policy related to complex issues around common property resource management in relation to the poor, would have been made".

## KEY ACHIEVEMENTS

### **National Fisheries Policies**

In Kenya, a draft National Fisheries Policy has been developed and is awaiting submission for Parliamentary approval. In Tanzania, a National Fisheries Policy was prepared in 1997 but the DoF intends to update and expand it possibly with technical support from the IFMP project. In Uganda, the Department of Fisheries Resources developed a National Fisheries Policy, with technical and financial support from the ILM project. The policy was subsequently approved by Cabinet in 2004. These policies promote, guide and support a co-management approach, setting out roles and responsibilities of key stakeholders including Government, civil society, the private sector and NGOs.

### **PRSPs**

The fisheries sector in each EAC Partner State operates under the wider umbrella of national development frameworks. In all three Partner States, significant developments have taken place through revision and updating of their national Poverty Reduction Strategy Papers (PRSPs). The PRSPs provide the strategic frameworks which guide national development through Medium Term Expenditure Frameworks (MTEF) and national sector plans and budgets. All three States are striving to achieve the Millennium Development Goals (MDGs). Sector plans, and national and regional projects within these plans, must be closely aligned to the wider development objectives and strategies set out in the PRSPs and must clearly demonstrate their contributions to poverty reduction and economic growth.

In Kenya, a new 3-year development framework is set out in the "Economic Recovery Strategy for Wealth and Employment Creation, 2003-2006". This Strategy aims to build a modern, prosperous nation through pro-poor growth supported by improved democracy, empowerment of people, institutional reform and good governance. With regard to capture fisheries, priority actions planned within the Economic Recovery Strategy, include formulating a comprehensive Fisheries Policy, institutional capacity building, close regional cooperation and promotion of bilateral negotiations with the EU and other fish importers. Efficient institutions, secure export markets, increased fish catches

and increased incomes for fisher families are key expected outcomes of the Strategy.

In Tanzania, the National Strategy for Growth and Reduction of Poverty (NSGRP), 2005-2010 focuses on poverty reduction and stresses that economic growth is necessary but not sufficient for poverty reduction. To achieve this equity issues must be addressed under an enabling environment of good governance. The NSGRP recognises the significant contribution that natural resources play in economic growth and poverty reduction and highlights the need to address unsustainable exploitation of these resources and to introduce improved co-management of resources by involving communities. One of the key aims of the NSGRP is to diversify rural livelihoods to relieve increasing pressure on common property resources. An issue of direct relevance to capture fisheries is the need to promote improved utilisation of nutrient rich foods (e.g. fish), particularly in rural areas. This is viewed as being even more urgent given the increased prevalence of HIV/AIDS amongst vulnerable groups such as fisheries communities.

The use of child labour in the agricultural sector is identified as a major concern, again this is of particular relevance to fisheries. The NSGRP is committed to deepening decentralisation, strengthening the capacity of local governments and establishing effective participation of civil society in decision making, equitable representation in institutions, and fair and accountable systems at all levels within and outside Government. All sectors are expected to revisit their respective sector development plans to ensure close alignment and coherence of these plans to national prioritised development goals.

In Uganda, the government has prepared its second PRSP, known as the "Poverty Eradication Action Plan" (PEAP). The Department of Fisheries resources, supported strongly by the ILM project, succeeded in securing the recognition that the fisheries sector is a major contributor to poverty reduction and economic growth and were able to get fisheries priorities incorporated for the first into the PEAP. Areas of key importance requiring priority support included the need to support fisheries co-management, community Beach Management Units (BMUs) and Lake Management Organisations; the establishment and capacity-building of BMUs to co-manage beaches and lakes and improved monitoring and control of illegal practices.

### **Building and Strengthening Civil Society Organisations**

BMUs were first established in Tanzania on Lake Victoria with the support of the Lake Victoria Environmental Management Project (LVEMP) which built on landing site committees established as a result of the EU bans on Nile perch exports in the late nineties. The way that BMUs were set up varied between landing sites and there were no clear guidelines or regulations for their establishment, structure or operation. As a result, BMUs were not socially inclusive, comprised only a small number of people and were not founded upon democratic elections or principles.

In Uganda, the DFR, in partnership with the ILM project, recognised the opportunity that the concept of BMUs in Tanzania and Kenya offered and

began a systematic process to establish fisheries co-management in Uganda based on BMUs. This involved the participatory development of national BMU guidelines and law over a two-year period. As part of the ILM project, over 205 BMUs were formed on lakes Kyoga, George and Edward in accordance with the national BMU Guidelines and BMU legislation. All BMUs received systematic training in how to operate as a BMU and in financial management and fisheries management. Through NGO involvement and donor support, a small number of BMUs were also established at landing sites on lakes Albert and Victoria in accordance with the national guidelines and law.

The experience gained by DFR and ILM in building BMUs in Uganda was later systematically applied by the LVFO, with support from the IFMP project, on Lake Victoria. In 2004, the LVFO agreed to develop harmonised guidelines for the establishment and operation of BMUs on Lake Victoria. The guidelines were supported by the development of national BMU legislation in each Partner State. The Ugandan national BMU guidelines provided a solid starting point for developing the Lake Victoria Guidelines and national BMU regulations in Kenya and Tanzania. The IFMP project went on to support LVFO in reforming BMUs on Lake Victoria in Kenya and Tanzania and forming BMUs for the first time on the lake in Uganda. By the end of 2006, the establishment process was complete and a total of 1,087 BMUs were established on Lake Victoria. This was an historic moment for the lake which paved the way for fisheries co-management. All BMUs were then trained in operating as a BMU and in financial management. BMU training continues under the IFMP project.

### **Reshaping and Strengthening Government Fisheries Institutions**

In Uganda, the DFR and ILM project collaborated closely in developing strategies to strengthen fisheries institutions at all levels and to ensure that they were well-linked at macro-meso-mico levels. It was agreed that at local level, the most effective way to strengthen the public-private partnership between BMUs and Government was to build the capacity of local government fisheries officers in parallel to BMUs and to use them as agents of change in establishing the BMUs. This was undertaken and completed successfully on lakes George, Kyoga and Edward. The same process was adopted two years later at regional level by the LVFO and the IFMP project on Lake Victoria. The process involved training of fisheries officers to serve as change agents as part of an extensive awareness creation programme so that each landing site was reached by a trained officer, usually a fisheries officer, but sometimes officers from other sectors, such as community development.

At a lake wide level (meso-level), DFR and ILM worked with Local Governments in fisheries and other sectors (e.g. wetlands, wildlife, forestry, NEMA) over a two year period to create the first Ugandan lake management organization (LMO) on Lake George called the Lake George Basin Integrated Management Organization (LAGBIMO). This new institution was based on existing institutional mechanisms which allowed district governments to form associations. It went further by incorporating BMUs in all its structures.

Although the process of forming LAGBIMO was supported financially and technically by the ILM project, the resultant structure was decided by its stakeholders. The project cautioned against building a structure too large that it becomes unaffordable but the warning was not heeded (see Section 5.3). The funding of LAGBIMO was agreed to be from contributions by its members, i.e. local governments and BMUs.

The process was later repeated on Lake Kyoga where the Lake Kyoga Integrated Management Organisation (LAKIMO) was formed in 2003. Here, despite being a much larger lake, the institutional building process took less time because of lessons learned from Lake George. A major difference between the lakes was in the number of BMUs, on George there were only 8, whereas on Kyoga there were 192. This meant that BMUs had to form associations at higher levels to enable democratic representation at the highest lake wide level in LAKIMO. These LMOs provide institutional linkages between central and grassroots fisheries management institutions and bring together national institutions, local governments and communities who have a stake in lake resources.

In all three Partner States, there are intentions to reform fisheries management structures at a national level to improve efficiencies in service delivery, retain direct control of revenues raised from the fisheries sector and broaden stakeholder representation in decision-making bodies on how these funds are utilized for management and development. In Tanzania, this process covers only marine fisheries whilst in Kenya and Uganda, it covers inland fisheries.

The ILM project provided technical support to DFR in developing the proposed structure, functions and financing of the Uganda Fisheries Authority (UFA). Technical support was also provided by the IFMP to promote UFA and to help the Department of Fisheries design the Kenya Fisheries Development Authority (KFDA). These new Authorities, when established, will link closely with the LVFO and other lake management organizations. Approval has been given by Government for the establishment of UFA but its legal establishment is dependent on Parliamentary approval of the new Fisheries Bill. The national elections in Uganda slowed progress in presenting the Fisheries Bill to Parliament but this is expected to take place during the coming year (2006/07). There still remain questions on transitional funding of UFA in its first years of operation. In Kenya, The KFDA policy and legislation, developed with IFMP technical support, have not yet been submitted for Parliamentary approval.

### **Developing and Harmonising Enabling Laws**

The development of supportive legislation providing legal identity and power to fisheries institutions at micro-meso-macro levels was regarded by national fisheries institutions, ILM and IFMP as being essential for the establishment of a functional fisheries co-management system. This involved the development of BMU regulations in each partner State, the updating of national Fisheries Acts, developing legal recognition for regional lake management organisations e.g. LVFO through its Convention and, in Uganda, LAGBIMO

and LAKIMO through their Constitutions; legal empowerment of new Fisheries Authorities e.g. UFA and KFDA. With regard to national Fish Acts, Tanzania has developed and recently updated Act in 2003, Uganda is awaiting submission of its Fisheries Bill to Parliament and Kenya is in the process of finalising an updated Fisheries bill for submission to Parliament. ILM and IFMP provided technical support in drafting Bills in Uganda and Kenya respectively.

Legislation empowering community BMUs in Uganda was enacted in 2003, BMU regulations were approved in Tanzania in 2005 and Kenya has developed a very detailed set of highly supportive BMU regulations awaiting submission for approval. The ILM project supported Uganda whilst the IFMP supported Kenya and Tanzania in these legislative developments.

On Lake Victoria, the IFMP project is supporting LVFO harmonise a variety national laws relating to fishing gears, fishing methods, licensing procedures, gazetted landing sites, control of fishing effort in order to improve management.

### **Developing Linked Planning Systems and Plans**

In Uganda, the draft Fisheries Bill sets out the mechanisms for a well-linked fisheries planning system. In this system the national Fisheries Sector Strategic Plan (FSSP) is generally aligned to the PEAP (Uganda PRSP) and provides the umbrella framework for lake management plans e.g. by LAGBIMO and LAKIMO, District Fisheries Plans and BMU plans. Apart from the fact that a national plan is essential for putting policy and legislation into practice, added stimulus to develop such plans came from the new way of acquiring donor support through central budget support and basket funding using a sector wide approach (SWAp). The national strategic plan appears to have become the required entry point for receiving such support. ILM devoted considerable effort and resources in not only helping DFR develop a draft FSSP but also the lake management plans of LAGBIMO and LAKIMO. These plans were incorporated logical frameworks with indicators relating directly to key governance issues. This was a key way to ensure that improvements in fisheries governance were explicitly measured and monitored as part of government planning systems.

Also in the area of local government development planning, ILM was influential in ensuring improved integration of ENR concerns into the final draft of the national Harmonised Participatory Planning Guide for Parishes and in promoting the need for better integration of ENR in development policies and plans within local government. ILM also made important contributions to the national poverty studies by providing clearer poverty environment linkages.

On Lake Victoria, the IFMP project modified its design indicators during the Inception Phase to introduce a set that more closely related to making improvements on fisheries governance issues relating to representation, power sharing and more equitable share of access to and benefits from fisheries. The project focused its support in planning at regional level by

helping LVFO to develop planning structures and systems which have produced many significant outputs in the last two years.

These have included regionally harmonised guidelines for setting up and operating BMUs. The guidelines contain an agreed BMU performance monitoring system with process indicators related to governance issues of participation of marginalised groups in decision-making, and to the transparency and accountability of BMU operations. Other key regional planning documents include MCS guidelines which are particularly important for directing patrol operations; LVFO Standard Operating Procedures for collecting and analysing fisheries and socio-economic information; regional strategies for Communication, HRD and HIV/Aids in fisheries; Regional Plans of Action for IUU and Managing Fishing Capacity. The latter is the first of its kind globally for inland fisheries. All of these regionally harmonised plans and guidelines are being used to guide extensive field activities on the lake in the three Partner States.

### **Collection and Analysis of Information for Planning and Management**

Regular collection of monitoring information to assess the state of fish stocks and understand the environmental, social and economic impacts of management measures is an essential component of any fisheries management plan. The means of collecting such information can vary greatly depending on many factors but size of the system is one of the key influencing factors. On the relatively small Lake George, the ILM project established a fisheries information collection and analysis system which closely involved the communities themselves.

On the very much larger Lake Victoria, a wider range of fisheries surveys were established using regional Standard Operating Procedures for trawl, hydro-acoustic, gill-net, light-fishing and periodic census surveys. Communities were involved in catch assessment surveys but not as closely as on the smaller lake. Lake Victoria also provided a more reliable time series of data upon which to base fish stock assessment. The IFMP project provided technical assistance to develop an innovative Fisheries Management Decision Support Tool (FMDST) to help managers take important management decisions secure in the knowledge that data upon which the decision was based, were collected and analysed in manner agreed across the three Partner States. This was viewed as particularly important by the LVFO given a history, prior to IFMP, of disputed data and conflicting views on stock status.

### **Participatory Control of Access to Fisheries**

With increasing human populations, the open access nature of fisheries has attracted many newcomers to lake fisheries resulting in at least a doubling of fishing effort on many lakes over the past decade. Since the mid-1990s, there have been signs of decline in many of the dominant fisheries, with classic indications such as declining catch per unit effort, a reduction in age/length at maturity, higher mortality, and an increased proportion of immature fish in the catches. The ILM project worked on two very different lakes with regard to access control. Lake George was a “controlled” lake with a limit on the number of fishing boats and nets allowed on it by central government. This



system had been in place since the fifties and there widespread dissatisfaction with the way it operated. In contrast, on the larger, Lake Kyoga there was no limit on boat or gear numbers.

As part of deepening decentralisation, the DFR delegated responsibility for fisheries licensing to local governments and ILM seized the opportunity to help DFR go further by involving BMUs in the licensing process and to use licensing as a local management tool. A system was established that vetted all applicants, provided allocations to women and crew as well as the traditionally dominant boat owners and spread access by allowing only one boat license per household and favoured locally resident households rather than outsiders. The new system had massive impact on peoples' attitudes and perception, and for many people this was the first time that they realized the potential power of the new co-management system on their livelihoods. The new participatory system of licensing positively addressed key governance, poverty and gender issues.

Unfortunately, the project did not have time to establish the same system on Lake Kyoga but the IFMP project and LVFO have realized that a similar approach might provide major benefits on Lake Victoria especially for the more threatened species such as Nile perch. Consequently, the draft RPOA-Capacity document for Lake Victoria included options of using fisheries licensing in a participatory manner as a means of controlling effort and access.

### **Sustainable Financing of Co-Management Institutions**

Sustainable financing of fisheries institutions at all levels is essential for their functioning and survival. Funding by Government is seriously inadequate in Kenya and Uganda, highlighting the urgent need for fiscal reforms within the fisheries sector. In Tanzania, the Fisheries Division established a Fisheries Retention Scheme deriving funds from levies and royalties on fish exports from Lake Victoria (Nile perch) and marine waters. It uses these funds to support priority fisheries programmes.

More recently, a Deep Sea Fisheries Authority has been established in Tanzania which will retain revenue from the marine fisheries EEZ to be used for management and development purposes. In Uganda and Kenya, the national fisheries institutions are intending to establish more autonomous national Fisheries Authorities with powers to directly retain revenue generated by fisheries and use it to fund fisheries activities.

All sources of revenue for fisheries management which are, or will be, generated directly from fisheries will be based on a "User Pays Principle". This principle is being applied to the fish export industry in the three Partner States. Studies on establishing a Fish Levy Trust by levying a fee on the export of Nile perch from Lake Victoria were undertaken with support from LVEMP and a regional synthesis report made recommendations for regional harmonisation. In July 2006, a levy on the export of fish and fish products was agreed for the first time in Uganda but has yet to be implemented. Once implemented, the next step will be to agree on how funds are distributed

between institutions and programmes and who will take decisions on these funding allocations.

The User Pays principle also applies to the revenue generating powers bestowed upon BMUs through regional and national BMU guidelines and national legislation. In two countries, Uganda and Tanzania, in addition to revenue raised by BMUs through charging user fees, the District Local Governments operate fisheries tax collection systems that are tendered out to private individuals as a means of raising local tax revenue. The funds raised in this way are not normally reinvested in fisheries management or development but diverted to other priority development programmes such as health and education.

In Uganda, the DFR and ILM documented many harmful and exploitative impacts of the fisheries tendering system and developed ways to avoid these through legislation in the draft Fisheries Bill. Through the Bill, the fisheries tendering system will be replaced by a BMU-operated Landing Site User Fee (LSUF) which will generate considerable funds not only for the BMU and its higher committees for local fisheries management, but also for Local Governments, and for the emerging Uganda Fisheries Authority. At the same time, it will reduce the tax burden on poor fishermen and traders. IFMP is currently supporting LVFO in examining options for sustainable financing of BMUs and all other LVFO structures.

### **Promoting a Savings Culture in Fisheries Communities**

While fishing has become much more important economically over the past three decades, the benefits have not been equally distributed so that poverty remains high within fishing communities and there is little sign of a savings culture to accumulate any wealth earned from fisheries. The ILM and IFMP projects therefore focused effort on promoting and guiding BMUs in opening and running BMU bank accounts as part of a training module on financial management given to almost 1,300 BMUs. Many BMUs established under ILM subsequently went on to open and run bank accounts supported and guided by local government fisheries officers. The same is currently happening on Lake Victoria under the IFMP project. This is viewed as the first step towards attracting more banking facilities closer to landing sites and the opening of accounts by individuals of BMUs as well as the BMU as an organization.

### **Participatory Enforcement of Fisheries Rules and Laws**

As fishing effort increases and catches per fishermen decline, fishermen often resort to illegal methods and gears to maintain their catches and incomes, inevitably catching smaller, often immature and less valuable fish. Actions to address this issue were similar under ILM and IFMP involving the establishment of transparent, accountable patrol operations undertaken at inter-district level and involving BMU representatives in patrols. On Lake Victoria, given its size and international boundaries, patrol activities were also undertaken at national level. It was, however, realized by the IFMP project that even this participatory approach may not be enough to significantly reduce widespread illegal activities. The project is therefore currently adopting

a “carrot and stick” approach. In addition to the punitive patrol approach, the project is introducing incentives and rewards for achieving local reductions in illegal activities by BMUs and Local Governments. It is also exploring practical and cost effective ways to transform illegal fishing operations into profitable legal enterprises.

### **Securing Fish Resources**

The numerous institutional, social and legislative achievements made as part of developing a co-management approach in the EAC are expected to secure or improve the fish resource base. Monitored fish resources by the ILM project on Lake George revealed no clear evidence of healthier fish stocks or increased abundance. On Lake Victoria, there is also no clear evidence that improved management has resulted in increased fish productivity. It is, however, a little early to expect such major improvements in such a short time on large lakes such as Victoria. What is more clear is that many of the institutional, social and legislative processes are fitting into place to induce improvements in the fish resources.

### **Improving Infrastructure and Services at Landing Sites**

There are few support services available for fisheries communities living at landing sites and associated villages. As a result, education levels are generally low and there are very poor health, water, sanitation services and feeder roads. There is also inadequate fisheries infrastructure for fish handling processing and storage. In response, the IFMP project has directed a considerable proportion of its resources to improving working and living conditions of fisheries communities through improved infrastructures.

### **Reducing HIV/AIDS in Fisheries Communities**

There is an on-going human disaster within the fisheries communities of the EAC caused by HIV/AIDS and the effects are far more prevalent than in most other places in the region. Not only does the disease cause immense suffering to infected individuals and their dependents but also has major harmful impacts on the fisheries labour force as a whole. Sadly, insufficient attention is still being paid to this crucial issue. The ILM and IFMP projects therefore took upon themselves the tasks of highlighting this issue.

Since the design and budgets of both projects did not provide resources to directly tackle the HIV/AIDS problem, the projects actively engaged with agencies to attract interventions and support to fisheries communities. The ILM project attracted a DFID-funded research project on HIV/AIDS in fisheries communities on the major lakes of Uganda. In collaboration with DFR, this later led to the development of a national Strategy and Action Plan to address HIV/AIDS in fisheries communities in Uganda.

Similarly, IFMP supported LVFO in bringing together various organizations to establish a network of institutions which had expertise to address HIV/AIDS in Lake Victoria fisheries communities and a Strategy and Action Plan was developed specifically to address HIV/AIDS in fisheries communities on the lake. This has been followed by a regional initiative under the Lake Victoria Basin Commission funded by SIDA and implemented through a regional

NGO, African Medical Research Foundation (AMREF). As legally recognized civil society organizations, BMUs provide particularly useful institutional entry points for these and other rural development initiatives around lake shores.

## LESSONS LEARNED

### **Resistance to Improved Governance**

Good governance provides the general conditions within which economic growth, well-being and poverty reduction take place. One of the greatest challenges facing the sustainability of a co-management approach is to ensure that policies are actually put into practice in accordance with laws and guidelines, and that they are not “hijacked” by more powerful members in rural society, political leaders or domineering government officials or private individuals whose self interests may overrule sustainable and equitable use of fisheries resources. These are governance issues facing all sectors not just in natural resources management.

A recent assessment of BMU performance on lakes George and Kyoga commissioned by the IFMP project, two years after ILM project assistance ended, found that BMUs have successfully been able to perform most of their functions to one degree or another. It was found that BMUs can effectively:

- Continue to organise themselves, hold meetings, improve social harmony within the fishing communities and act as fora for collective prioritisation of beach development, and conflict resolution between multiple stakeholders.
- Collect some revenues, account for them transparently, and utilise funds raised for effective Beach development and social programmes.
- Ensure some reasonable degree of social inclusion for poorer members, including fishing crew and women, and provide occasional support to poorer members of the community, in times of need, and
- Contribute to the control of illegal fishing gears and methods.

However, there were very few BMUs that had effectively achieved all of the above, whereas quite a number had successfully performed some, but not all of these responsibilities.

The study confirmed that governance needs to be improved, and can only be improved by gradual, determined and concerted local effort, and by making decision-making systems and processes as transparent and accountable as possible. This, in turn, requires the following:

- Expect resistance to change by those who wielded influence and power prior to the change process. These are likely to be from within communities themselves as well as in government and politics;
- Use new legal powers, especially by poor and marginalised stakeholders, to counter any resistance to improved governance and management;
- Keep information of all kinds flowing to relevant stakeholders to allow them to be aware of decisions and events that affect their livelihoods;

- Ensure that the democratic power of the BMU Assembly is not eroded and taken over by a minority in the BMU committee;
- Using information flows, it is imperative to monitor the performance of local leaders in BMUs or government and, when necessary, bring them to account so that any abuse of office or power can no longer be done with impunity. This means tackling malpractice and corruption with more forceful disciplinary measures, paying particular attention to financial processes within communities and government.
- Build strategic alliances to counter resistance to change by informing, engaging and influencing key political leaders from the outset, especially in programmes involving the need for legislative change.

### **Mentoring & monitoring**

The IFMP project learned from ILM experience by setting up extensive BMU mentoring and monitoring programmes. These were considered vitally important to steer and guide the newly emerging civil society BMUs and ensure that improved governance and management were not undermined by illegal activities of local or central elite.

### **Government decentralisation**

With the exit of the ILM project from Uganda, the new lake management organisations (LAGBIMO and LAKIMO) struggled to operate and even survive. This was due mainly to the failure of Local Governments to meet their financial commitments to maintain small secretariats of these organisations and provide support to lake wide activities. Little support to these LMOs was also provided by national government. The evidence indicates that decentralisation does not automatically lead to improved natural resources management and the potential benefits of decentralisation are not always easily attained.

Certainly during the life of ILM, limited capacity in many areas of local government and the slow release of funds and their accountability delayed the implementation activities. In many cases, Local Governments, clearly needed effective guidance from central government on developing and implementing systems, for example, for monitoring and evaluation, community-based planning and financial management. However, ILM did work well with all the local governments on George and Kyoga and would not have been able to implement the approach without their co-operation and dedication.

In light of ILM experience, the LVFO and IFMP are currently considering the potential roles of Local Governments and BMU associations in meso-level structures of LVFO.

### **PRSPs as Financial Drivers of Development**

In Uganda, the explicit intention of incorporating fisheries into the PEAP was to gain the acknowledgement from central budget controllers of the importance of fisheries to the country and to obtain justified increases in budget allocations directed towards prioritized, decentralized, programmes through the conditional grant system adopted by other programmes such as health, education, roads etc. Despite detailed evidence provided in the PEAP

of the significant contributions made by capture fisheries to national poverty reduction and economic growth, there was no subsequent increase in funding to fisheries sector. On the contrary, budget support decreased in the following year. This in turn meant that the DFR could not undertake its duties to adequately promote, guide and support the emerging and vulnerable lake management institutions and BMUs. This experience highlights that continually lobbying is needed to obtain adequate budget allocations even when fisheries priorities are explicitly incorporated in PRSPs.

### **Importance of Projects as Effective Donor Support**

Experiences and outcomes from ILM and IFMP projects clearly demonstrate the effectiveness and efficiencies of the delivery of donor assistance to developing countries. The role of a well designed project, with clear strategic relevance to national or regional policy and development frameworks is currently being downplayed or ignored by many donors and recipients. The abilities of ILM and IFMP to work at all institutional levels – micro, meso and macro – and to ensure linkages were formed and strengthened between all levels with feedback loops to inform further policy and legislative development, are achievements that cannot normally be attained by the preferred donor budget support mechanism.

Continued donor support is crucially important at this transitional stage in shifting from centralised to participatory fisheries management, when institutional development and capacity building costs are high. The pace of change is also not always easy to predict, especially where political reform processes and legislative changes are involved, but clearly a longer than normal time horizon is needed to assure continuity in co-management development, capacity building and implementation.

### **Scale of Co-Management Initiatives**

The approach to BMU formation taken on lakes Kyoga and Victoria was necessarily top-down, based on overarching and supportive policies and laws. It was an approach based not on small-scale management crises but one which required effective and extensive outreach to reach numerous, scattered communities. This is not to say that important lessons were not learned when scaling up the implementation of ILM on Lake George to Lake Kyoga and then to Victoria. On the contrary, many institutional and legislative lessons were transferred resulting in substantial savings in costs and time. ILM experience also proved invaluable in designing and implementing the outreach programme on Lake Victoria. This showed that there was sufficient flexibility in the system to allow appropriate tailoring to suit the needs of lakes of any size.

### **Legal Empowerment of Communities**

A key lesson was the crucial importance in acquiring legal empowerment of community organisations, which, in the EAC are BMUs. Without legal identity and power, these new groups are very vulnerable to local leaders who may not wish to see improvements in local governance and management. Legal identity is also crucial to demonstrating clearly the mandate of BMUs within local government systems. The development of BMU legislation provides a

vehicle for addressing explicitly issues of governance, gender and social poverty through, for example, the legal allocation of places on decision making BMU committees for women and boat crew.

### **Valuation of Fisheries Benefits**

In order to attract Government and development partner investments, and to get priorities embedded in PRSPs, reliable economic evaluations are needed of the contributions made by fisheries to poverty reduction and economic growth and to show how these are shared between different stakeholders.

### **Sustainable Fisheries Financing**

The sustainable financing of fisheries management institutions is a rather obvious lesson but nevertheless a very important one. It is also one that is sometimes ignored during the initial process of developing new institutions or modifying existing ones. It can be a process that often takes longer than expected, especially when legislative amendments are needed, so it is wise to start considering options at the earliest opportunity.

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The background of the title section is a solid green color. On the left and right sides, there are faint, light-colored silhouettes of people's heads and profiles, facing each other. In the center-left area, there is a small, light-colored heart shape. The title text is centered in the lower half of this green area.

## Embedding co-management: Community-based Fisheries Regimes in Lake Victoria, Tanzania

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## ABSTRACT

This paper discusses fisheries management reforms through involving local level institutions (LLFI). It is based on studies which were undertaken on Tanzania's Lake Victoria fishery where LLFIs were established through the formation of Local enforcement Units, later named Beach Management Units (BMU), between 1998 and 2002. The paper takes the view that the overfishing problems that confront Tanzania's fisheries management authorities are best understood from a social science perspective. The argument is that most communities' values and institutions are embedded in their societies. The same is however, not true for externally originated management tools and systems as is the case with BMUs. This paper shows that the BMUs established between 1998 and 2002, were not sufficiently grounded in their socio-cultural environment and this led them to be unsustainable and ineffective. The paper demonstrates that this mismatch by examining the different historical and social contexts in which livelihoods such as fishing emerged and was carried out. These social contexts generated social values that explain the individual behaviour of community members. It is such values that communities always strive to maintain in any activity including fishing. Thus, when confronted with situations that threaten these values, communities strategize or negotiate ways to cope. The coping strategies of two communities riparian to the lake are discussed. The paper therefore proposes a framework for making these units 'fit' local conditions in order to make them effective and sustainable so as to reform fisheries management.

Key Words: Fisheries Management, Co-management, Institutions, Lake Victoria, Socio-cultural values and Embeddedness.

## INTRODUCTION

In their quest to address the problem of overfishing world wide (Pauly et al. 1998), social scientists have argued strongly for the inclusion of fishers in the management process (c.f. Kooiman et al 2005; Wilson et al. 2003). Social scientists view fishers as social beings whose behaviour is embedded within a set of socio-cultural values, norms and knowledge defined by the community in which they belong and where they attain their identities, beliefs and actions (Granovetter 1985; Kurien 2001). These values define their power structures and guide their actions as they relate to natural resources such as fish. Capturing these values by involving the fishers in the management of their own resource leads them to take more responsibility for sustainable fisheries exploitation. Central to the participation of fishers in fisheries management is the issue of institutions<sup>1</sup>. It is through institutions that behaviour is defined and order is achieved.

One strategy of trying to address the issue of social forces in management structures has been the development of co-managerial strategies. That means incorporating the 'civil society' (Jentoft and McCay 2003) in fisheries management. But it is not just a matter of bringing the civil society into the management process per se, but a proper design of such participation is required to enable effective community-based

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<sup>1</sup> In this paper, institutions are defined as regularized pattern of behaviour that emerges from underlying structures

fisheries management. The design has, among other things, to deal with issues of legitimacy (Jentoft, 1999) and property rights. Share out of management responsibilities among stakeholders is essential here which requires an understanding of institutions operating within the stakeholder community. These include institutional histories and social context (Jentoft and Mikalsen 2003). This is to say that institutions operate within a particular socio-cultural context. Whether they are created or built on old ones, institutions must correspond with their local environment. The argument is that institutions if they are made to operate within a given social and cultural context, they will work well. Fisheries cooperatives are given as an example of such institutions that have often been unable to adjust to the institutional forms at the community level (Jentoft 1986).

This paper discusses the formulation of a co-management regime in the Lake Victoria fishing (Tanzania) communities. The paper examines the set up of the regime which occurred during the period 1998 – 2002 by forming Beach Management Units (BMU). These BMUs are here referred to as local level fisheries institution (LLFI). The premise is that the principles of co-management are not necessarily new to local communities but have been operative as of the local institutional fabric. However, co-management was set up with very minimal recognition of the institutional forms that exist at the community level and this led to their poor performance that warranted their reformation. The challenge for advocates of co-management therefore is to design it in a way that its structure is sensitive to the local cultures.

The paper begins by a theoretical perspective of understanding communities. This is then followed by a discussion on community values and how these values were studied. A discussion on how these values originated and are used in community activities is then presented, this is then discussed in the light of the established BMUs, we discuss the pitfalls of the BMU regime based on the use of the community values. We finally draw a conclusion and lessons for co-management.

## EMBEDDED INSTITUTIONS: SOME THEORETICAL CONSIDERATIONS

The notion of embeddedness (Polanyi, 1957 Granovetter, 1992) is used here to understand the local social set-up. Embeddedness has been presented as the contextualization of economic activity in on-going patterns of social relations (Granovetter 1985). This notion seeks to show that economic exchange is embedded in and defined by complex social processes. Thus, from this perspective economic behaviour such as fishing is embedded in wider social relations. In fact Coser and Rosenberg (1957) argued that the maximization of favourable attitudes from others would thus be the counterpart in sociological theory to the maximization of profit in economic theory. When relating to others or the environment, individuals will not act to safeguard their individual interests but to safeguard their social standing, claims and assets, which the individual acquires through his/her membership of a community or group. It is this group or community that defines his or her social standing, claims and assets. The community or group has designed a behaviour pattern and so by living in the community or group the individual acquires the pattern or way of doing things of the community and this is internalized (Durkheim 1974) and becomes an individual's behaviour. So, the way an individual

actually behaves and what others see in his/her behaviour is in essence the community in him/her (Ibid).

More generally Berger and Luckmann (1972: 72), when discussing the origins of institutions, argue the same with regard to institutions: "Institutions ...by the very fact of their existence control human conduct by setting up predefined patterns of conduct, which channel it in one direction as against the many other directions that would theoretically be possible."

This argument does not negate or oppose the idea of an individual being responsible for what he/she does, in fact what happens is that as an individual socializes in the community or group to which he/she belongs, the individual becomes conscious of the 'me' in him/her through expressions and appraisals of his/her community or group members (Mead 1934). He/she is motivated to achieve a positive image of him/herself by winning the acceptance and status of the group or community.

People are profoundly sensitive to the expectations of others so all actions are inevitably guided by these expectations (Coser and Rosenberg 1957). It is further argued that this is a constant component of personality (Ibid). For this reason, an individual will internalize behaviour patterns that make his/her group or community appraise him/her favourably. But he/she can also choose to internalize behaviour that causes him/her to be appraised negatively and in this case the community or group will exercise negative sanctions such as blame and punishment. In this case, an individual is considered un-socialized, and or a deviant. For fisheries this means that the individual becomes a fisher from primary groups -in this case the ethnic community. Fishing activities practiced are a reflection of what the community has defined for fishers. The type of fishing gear, seasons, areas and types are a reflection of the community to which an individual belongs. When out fishing he/she is in another group, the 'fisher's group', in this group he/she acquires the characteristics and behaviour that depict the fishers group.

This means that the behaviour of fishers is based on internalized values and norms of their community that guides them on how to respond to various situations. To individual community members who are exposed to a proto-realistic world in which they can afford the luxury of at least a modicum doubt (Berger and Luckmann 1972), the demands of community behaviour are of a higher priority than any other demands on behaviour (for instance fisheries authorities behaviour demands). Therefore fisheries regulations will in essence be complied with in as far as they do not interfere with the "voice" of the community. Compliance to government fisheries laws and regulations is based on how a community perceives them to be legitimate (Gezelius 2004). In addition to this, the community will view participation in a co-management regime as a means of perpetuating the way a community does things rather than introducing new patterns. As a consequence, if the fisheries regulations imposed from the outside are contrary to the way a community do things, the community will try to diffuse it by designing a method of presenting their efficiency in executing the government fisheries regulations to the fisheries authorities in a manner that the latter wants to hear while in reality the opposite is true.

Thus, in order to understand how LLFI's work as management institutions, it is important to understand the traditional and cultural environment in which they

operate. Local communities have different histories on what their existence depends. The manipulation of the natural resources and systems to provide for such needs generated varied meanings and the value communities place on them. Such meanings and values have been reflected in the way communities have interacted with the environment, with each other and with others external to their community. Communities have enacted rules and regulations through which they have interacted with the environment (Bromley, 1991). Bromley argues that these rules present property rights regimes and include rights and rules. These rules and regulations are nested within a larger unit (Hanna and Jentoft, 1996, Kurien, 2001). Individual behaviour, also those of communities, is therefore well understood from a larger unit of reference in which it is embedded (Kurien, 2001).

## COMMUNITY VALUES

In order to understand the values of these communities, a study was undertaken in 2003 to 2004. The fishing communities studied were the Wakerewe and Kakseru. The Wakiseru and Wakerewe are Bantu speaking communities. The Wakerewe currently live in the Ukerewe Island<sup>2</sup> on the lake whereas the Wakiseru presently live on the eastern side. Qualitative methods were used to study these communities. The specific study tools used included: Observation, In-depth interview, Historical analysis, Kinesics, Focus group discussion, Semi-structured interviews, Venn diagrams, Wealth ranking. Data was generated in two phases. The first phase involved gathering as much information as possible on the social set up of the selected communities, patterns of behaviour and the meanings of such behaviour. During this phase, information was generated in understanding traditional institutions and how they operate within the cultural milieu of these communities. The second phase involved generating information on the current LLFI's. This involved interviews with the members of the communities, leaders of the LLFI's as well as other members of the communities, especially opinion leaders.

The history of these communities reveals that there was a value placed on land and cultural and social relations. The value of land led the members of these communities to migrate from several places to where they are presently settled. Land was very important because it was mainly used for agriculture to produce food and for settlement. Cattle were yet another capital which became valuable especially for the Wakiseru during their migration. One possible reason could be that as they migrated they met the Nilots who were pastoralists and in order to create harmony with them, cattle played an important role as giveaway resource in exchange for ending hostility and violence. Cattle were also used for marriage between them and the Nilots. Just like land, cattle were very valuable because it guaranteed that there was food from its meat, milk for children, and blood for the youth and skin for clothing for the adults.

On cultural and social<sup>3</sup> values, community members adopted distinctive experiences while they migrated and mingled with people from other communities and these experiences gave them a unique status or reputation. Such experiences created

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<sup>2</sup> This is the biggest Island on the lake. It is actually administratively a district.

<sup>3</sup> In this paper social values referred to have the same meaning as social capital coined by Lin (2001) and Putman (1993, 2000) and cultural values as cultural capital as used by Bourdieu (1993 and 1984).

values which have been deeply rooted in the community or clan institutions. Their life's perspective tended to be channelled into a limited number of alternative patterns.

Each alternative was embedded in local institutions which channel behaviour into predictable alternatives. Some consistence of the value choices can thus be detected by observing institutionalized practices. For instance each of these communities is a location of several social institutions and hierarchies. Each institutional setting of importance has a tendency to create a cultural totality with distinctive aims and values and each cultural and social sphere has its own capital<sup>4</sup> (Seppällä 1998). Such values would for instance include holiness for a religious hierarchy which is acquired through a command of memory and interpretation of verses from the Bible or Koran and an appropriate behaviour. The social capitals are those that are vested in social relations and enable people to correlate. Such capitals include trust and respect which are expected to be reciprocal in social relations. It is this level of values that have created a socio-cultural environment through which community members live and all institutions (economic and natural) rooted. In this paper we concentrate on this level of values.

The two communities therefore present themselves as relatively stable locations where continuous interaction moulds members in similar direction. Thus members of the community are not directly seen or categorized as a homogeneous mass but this is the impression one gets with individual members exhibiting shared norms, values and behaviour. Within the Wakerewe and the Wakiseru, what comes out is a complex value system based on a mixture of their past diffused with values brought by colonialists. This value complex is further influenced by the values of the present brought by the state and the global community within the realm of sustainable development.

In the following we locate seven of these values from the past namely co-operation, respect, wisdom, traditional authority, order, continuity of lineage/kinship and trust. The values brought by the colonialists state and global community include education, competition and religion. The coming of the colonialists gave a new meaning to the past values and is slowly changing the values placed in them. These values are briefly discussed below.

### **Co-operation**

Holding of this value implied agreeing to work together with the others. This was evident in marriages, families, and agricultural practices and in fishing. It was considered a moral value where everybody was expected to exercise without being forced into. In fact it was desirable because as these communities and clans migrated and settled in a place, they realized that holding on to one another was necessary especially during deaths, wars and farming. These are also some of the ways in which co-operation has been maintained to date. This value was also seen to provide direct benefits to community members for instance in agriculture; - the weeding and harvesting together ensured that each family in the clan got food when it was ready. Co-operation during the fishing trip ensure that members of the group came home alive and happy. During arrival from fishing trip, the welcome offered to

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<sup>4</sup> Capital as used here refers to resources used to advance in social interaction.

those who went fishing was an indication of a joyous community or clan to receive back their sons.

### **Traditional authority**

This was universally recognized as a value base. It was exercised by elders who possessed knowledge of history on the community, wisdom (busara), age, elders coming from the chiefs clan, family heads (mostly considered to be men), the chief and clan leaders. Historically, influence by individuals with this value was limited by the scope of belonging to the community. It demanded respect and the holders were expected to exhibit behaviour of a role model in the community where the young members of the community could learn how to exercise all other values.

It was a desirable value to hold. It was also a required value to enable one to be appointed, selected or elected to position of leadership. This value has been maintained through behaviour where young people consult those possessing this value on a variety of issues such as marriage (including counselling), land, family relations, and community conflict resolution mechanism and even by those aspiring to be politicians consulting to receive approval.

A new meaning has been given to this value, for instance in Ukerewe where the District Commissioner is considered to hold this value, community members can listen to him. Any member of the community who exercises calmness, self respect and a champion of community interests is also seen to hold it. Elders are still highly seen to hold it regardless of whether they exercise the above-mentioned factors. Within the Wakiseru, generosity, which was an important factor for being recognized as leader in their clan, plays an important factor for one to be considered to hold this value. A generous person is considered to be one who is able to feed, give free help to people and is hospitable.

### **Respect**

This was a state of being regarded with high honour or esteem. In the traditional set up, to possess this value one had to be able to relate to others in a way that did not create anger, animosity, hatred and disunity in the society. It is a value that had no boundary of age, group, sex or clan in possessing it.

There was however a difference among various clans. Within the Wakerewe, individuals who came from the chief's clan enjoyed a higher level of respect than individuals from other clans. For instance an individual from the former clan was received with full attention if he visited any family within the clan. Activities that were being undertaken on that day in the family would temporarily come to a standstill as they pay attention to the visitor. He could be offered a chair to sit and fed extremely well, entertained and seen off honourably. But an individual from a clan other than the chief's would be welcomed when he visits, offered a chair to sit. Other activities would continue as usual, he would be fed if he found those he visited eating. But to both communities, all members of the family had a right to be respected regardless of one's possession of other values. This was a value that to a great extent controlled people's behaviour, it was highly cherished and nobody wished to be termed disrespectful. It was a value that if one lacked, then he/she would be negatively sanctioned through blame, punishment and at times end up in a perpetual curse. Behaviour expected to show respect was exercised differently to different



categories of groups, for instance behaviour to elders, youth and strangers was clearly distinct. One could joke, play or argue with peers but not elders.

### **Wisdom**

Considered as calmness, clear mindedness, being able to give good advice and exercising self-restraint. This is slightly different from other types of values because it does not form its own type of hierarchies. In the traditional society it was a privilege for the elders and the aged family heads regardless of their possession of other values. But slowly it degenerated to only being a privilege for a certain group of people such as the wealthy or men only.

The wealthy were a source of help to many people and the fact that they could understand their needs and offer the needed help showed that they possessed it. It could be shown to all people, even the poor who were carefully listened to when they expressed their opinion. In other words, wisdom was and is still being considered as having knowledge of the past and being able to use it to confront the present challenges and make good judgments and decisions. Today knowledge is not only considered a preserve of the old but also to those who go to school who are able to use the school knowledge to confront today's problems. Nevertheless, a difference still exists between the school knowledge and the old knowledge. The former is considered not to be deeply rooted in the latter but only to an external authority. Those who possess school knowledge and are able to integrate it with the latter have been considered to be wiser.

### **Order**

This is a value which is twofold. Order exists both at the individual and community or clan level. At the individual level, it was considered as the ability to avoid violence and cherish peace, and harmony and being able to reach agreement with others. At the community level, it was considered as a state in which community regularized pattern of behaviour that was a moral obligation for all members. In fact it was the value in which all other values were directed to, it was like the ultimate goal of the community or clan.

Being able to keep a promise as in marriage, exhibiting behaviour as is required of one and carrying out activities as has been the practice of the community or clan were all considered as being in possession of this value. But with time, interests have not remained static, there have been different interest groups emerging due to in and out migration to these communities in the wake of globalization and nationalization. Thus this value is now perceived to be the ability to hold to your group interest and remain united with other groups holding different interests.

### **Continuity of lineage/kinship**

This was and still remains a very important but silent value. It simply meant ability to reproduce. Women were disadvantaged because they were easily exposed in case one did not have this ability because it was easy to note they were not able to conceive and give birth. Men on the other hand although they suffered from this inability, they were always covered by having another man with this ability to father children with his wife in his name, this was made very secret.

This value is still held with high esteem and it is seen during funerals when an old man or woman dies all his/her offspring would be counted and publicly announced with pride during the funeral. This is taken as a consolation that although he/she is gone, he/she has left a 'big' community to carry his name forward. In addition to this there is also extreme joy when a woman gives birth; this has escalated to even births outside wedlock involving schoolgirls which was considered as a disgrace during those days. Although in principle birth outside wedlock is not encouraged, when it occurs it is never condemned but received very positively. Some young men who are intending to marry would prefer to marry a girl he knows will bear children and the only way they confirm this is whether the girl has a baby or not.

### **Education**

This is a new value brought by the colonialists. In the traditional society, it was considered in terms of knowledge acquired through having lived for a long time and gone through different experiences. Such experiences included clan or community migrations, conflicts with other communities, negotiations during marriage periods and identification and decision making on best areas to feed animals, fish and hunt. But now it is acquired through going to school and receiving a certificate which is believed to show that you possess it.

In Ukerewe, this value was not a major influence except when the holder uses it in the village context. In fact many of those who possess this value and come from the island are not residing here, some have moved out completely and others only come for short visits. The group which is visible are the teachers in several schools, both primary, secondary and one teacher training college, some of these teachers are actually from outside the district and they have been posted here by the government. They do not have any significant leadership in the community.

There are also other government officers working at the Village level such as the Village Executive Officers and Ward Executive Officers. Their responsibilities are vital but salaries are so meagre that they face the same livelihood conditions as the rest in the community. At the District level however, there are more educated people some with university degrees and others with college certificates.

This is also true within the Wakiseru but the difference here is that, possessing this value yields some extra status; elders who are opinion leaders in the community lend a listening ear when a holder of this value speaks. However, when such a person uses this value in a way not to support local prevailing ideas, then the locals isolate him and gossip is used as a social control mechanism to alienate him. Gossip is silently prominent in these communities such that it can be considered as an important value to marshal support for activities.

### **Trust**

This was a value assumed to be possessed by all members of the community. It was considered to be the ability to have complete confidence in and believe in the honesty and reliability of other community members. This value was assumed to be cultivated through interactions within the community. It was so crucial that one could consider it as the basic value that held the community together. It is this value that has kept the Wakerewe unique and cohesive to date. The idea of keeping secrets

and factors considered in being elected to BMU membership by the local community are good examples of holding this value.

Within the Wakiseru, this value was compromised for other values such as land when they decided to give their daughters for marriage. They could never keep their secrets such as war weapons, traditional charms to overpower opponents among others to themselves. This was because their daughters would reveal them to their husbands where they got married. Within the community this has further been compromised by school education which advocates academic objectivity, openness and honesty. In Ukerewe those with education have found it very difficult to compromise their new way of life and have responded by keeping away from the community and only paying short visits.

### **Competition**

This can be considered as a completely new value introduced by the colonialists and global community. In fact it can be traced as far back as the time of the Arab traders who used ivory to win the support of the chiefs. It is a value in which the holder expresses by acting in a way to outdo another, or take advantage of the inability of the other person to get something more than him.

It is evident in the society by people building better houses than others, having more certificates than others, and having a control of more people and more land. It has created divisions of people in the community. This value is considered as an impediment to social cohesion but is it highly cherished. It is a value which is considered as useful in an economic sense but it is disembedding the society.

### **Religion**

Religion is not very recent to these communities although in their history the concept existed totally in a different form, for instance Kalungu who was a fishing god was only useful during fishing time. Going to him happened only during times of need and not a regularized weekly or daily practice. The coming of colonialists gave a new meaning to this value, holiness which is interpreted as being able to memorize verses in the Bible or Koran and an accompanying appropriate behaviour was an evidence of possessing this value.

There are two religions within these communities, Islam and Christianity. Christianity is the dominating religion whereas Islam comprises of a small minority. The Christian churches have relaxed their rules to accommodate even those considered to be Biblically not appropriate to qualify as full members. For instance the churches except preach against polygamy but accept polygamists to attend their services. In both communities this value can be easily used to acquire other values such as political authority.

Based on these factors, when individuals met for discussion or activity, one ensured that these values were upheld. This was so crucial when talking or doing anything. To these communities, it is not only the activity being talked about that was perceived to be important but to ensure that these values were not diluted and that the activity being undertaken was not given opportunity to erode these values. This

required that all behaviour towards each other should reflect possession of these values.

Social relations were considered to be important above all other things. This is why the youth had to carry an elders' luggage when the latter came across the former, the decision of the Chief Mkuru had to be complied with at all times in the community. Possession of natural value such as land and being able to control a big labour force was of no consequence if one did not uphold the community values. Each one therefore strived to show behaviour that ensured he/she maintained his/her social standing in the community. Fishing, hunting and agriculture were all penetrated and customized by social relations, which dictated any outcomes from them.

## THE MAKING OF INSTITUTIONS

The values discussed above created a perception on what these communities considered to be morally right and on this basis rules were formulated reflecting their subjectivity (cognitive) on the rules. Thus the morals of these communities were founded on their social relations. To these communities harmony, unity and peace were the primary goals for social relations and constituted what was moral. Thus when rules were formulated, they considered whether such rules would promote harmony, peace and unity, or in other words social cohesion.

Elders, who were in most cases the rule makers, would observe during various occasions what activities and behaviour promoted social cohesion and when they identified one, they would approve of it and promote it in all possible ways to be regularized as the way of doing things. In this way institutions were created. In fishing, the gears used were not necessarily designed with the purpose of dependence on fish as the only way to live, but what could be seen from the use of such gears was that the community could get food, fish together and maintain the morals (harmony, peace and unity).

The rules which were enacted such as avoiding sex by both partners during the fishing period, sharing responsibilities while out fishing were all a reflection on upholding the community's values other focusing on the fish. One may argue that this was so because getting fish was not a problem and fish trade had not become so important.

However this cannot be true when for instance the Wakerewe took two full moons to be out fishing. Moreover interpersonal relations and networks have been found to be more important in trade than just prices and costs (Westerdahl 2001). Thus all institutions had a history and a reason for it. In most cases the history was linked to an occasion or event that the community went through. During this period, there was only one way of perceiving things, the elders' way.

Institutions were created based on a socio-cultural environment in which the society sought to be socially cohesive. But to maintain this cohesiveness, the various cultural practices which gave birth to these institutions had to proceed, these were the marriages, the family, the festivities such burial practices and harvest among others.

However, when outsiders such as the Arabs and colonialists came, a different environment was created. Local communities were compelled by the fear of the gun to succumb to the whims of the colonialists and as a consequence lost their freedom to practice their life the way they had created it. This loss of freedom was fought vigorously. This fight extended to these communities and had great impact on them.

To these communities, freedom meant that they could not continue enjoying the harmony, peace and unity that they had already created and so they had to fight to regain it. This fight enabled the late Mwalimu Julius Nyerere<sup>5</sup> to rally all ethnic communities in Tanganyika to fight. This rallying also implied dismantling the individual community strength and forming a bigger unit comprising all. But they also realized that in order to fight the white colonialists, they had to acquire literacy (reading and writing). Initially the colonialists had used literacy as a way to win the support of the locals, but now it was a useful tool in the fight for freedom. Through this, education was introduced and the value of knowledge to account for wisdom given a new meaning.

The fight for independence gave a new meaning to the values discussed above. Their new meanings did not differ so much from their original meaning except that if put on a scale, they were applied to a larger group beyond the clan or community level. The different communities in Tanganyika became a community where these values were exercised. But given that they were being used to fight for independence, the gaining of the independence in 1961 did not allow for the independence of the ethnic communities but for the whole country and so the communities remained under one big community.

Nyerere tried to suppress the local communities by trying to copy what was a practice in these communities especially on authority structure. He created villages under the Ujamaa socialism system. The head of the village was to assume the role of the chief (Mkuru), and he was to govern by a council of elders elected by the village members. Thus the culture which was already prevailing on the authority of the elders did not die but given a new meaning.

The transfer was made easy because a social cultural environment was already created based on these values. These communities still sought harmony, unity and peace not only among themselves but also with all others in the whole country. And because they coincidentally found that they shared these values it became much easier to adjust to one another. But there were factors affecting the values as institutions were being transferred, these were globalization and nationalization processes.

The industrialization and the accompanying technology, the fast changing information technology, and bureaucracy all brought in a new society which is the bureaucratic society. This society had to be introduced in the traditional society. As the two societies co-existed, a completely new society has emerged. A society which is here referred to as Tradi-rocratic society. This word is coined from traditional (Tradi) and Bureaucratic (-rocratic) making Tradi-rocratic. The meaning of

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<sup>5</sup> He was the first president of Tanzania

it is that this is a society in which the local people have accepted bureaucratic authority brought by the globalization. But at the same time traditional society has not been done a way with. It is within this Tradi-rocratic society that the two communities studied were found to be living. But local individuals still hold on to what their community demands from them.

Existence of Tradiro-cratic society is crucial for the survival of the local communities. Local people have been relegated to either being crew members in fishing camps owned by people who have connections with the Fish Processing Plants or by those who are able to invest heavily in the industry. Because these locals cannot invest to this level, they have to find a means of surviving and one such way is to become crewmembers. This implies that they have lost control of the fisheries resource as it used to be. Therefore their clinging to the Traditional society guarantees that they can continue to trust and co-operate with their fellow community members to gain access to the fish although through illegal means.

To them they believe that they have free access to the fish but they are being driven out by the technological changes which they cannot cope up with both in the catching and marketing sectors. They also accept that the traditional fishing organization in which they confined themselves to either traditional gears or beaches or fishing periods as no longer valid. They however, do not have any alternative through which they can improve their traditional practice except to cling to the traditional values. Their traditional leaders remain very useful and important but they have been ignored when the Fisheries Division introduces new institutions. This has left them to negotiate silently with these new institutions.

## THE PITFALLS OF BEACH MANAGEMENT UNIT

In 1998, the FD organized one-day meetings with local fishers living in selected beaches in the Mwanza Gulf of Lake Victoria. These meetings sought to involve local fishers in fisheries management. Several Local Enforcement Units (LEUs) were formed in the gulf as a result of these meetings. The LEU format reflected the FD perception of what and how co-management should operate in Tanzania.

The successful establishment of these LEU's in the Mwanza gulf encouraged the FD to establish them in the whole Tanzanian part of the lake. The LEUs were later renamed Beach Management Units (BMU). In 2000 the FD formed 57 of these units in Ukerewe island and 32 in Tarime districts among other districts. The BMU regime was formulated and implemented under such an unclear understanding of the operations of the Tradi-rocratic society.

The formulators assumed that having been working with these communities as a government gave them an automatic knowledge on how to implement a co-management regime with the variations it has acquired. The concept of legitimacy and compliance was understood from the angle of enacting laws in parliament and enforcing them. This was a complete contrast to what legitimacy and compliance was in the traditional society. In this traditional society, anything approved by elders and regularized, as 'our way of doing things' was considered legitimate.

Although parliament could be considered as the ultimate 'elders', its members are seen to be town dwellers who are detached from the reality of community conditions or have taken a different position once they have been elected. It is therefore here that the mismatch originates and the BMU regime ended up being an external model brought without much considerations of the local institutional fabric. That is to say, the BMUs were brought in on an understanding of a bureaucratic society principles developed and defined by a western culture of democracy, empowerment, legitimacy and equality. These principles have different meanings, understanding and value in a different culture like the Wakerewe and Wakiseru.

The BMU regime as established exhibited the following drawbacks:

**The BMU are established with an emphasis on economic capital**

In its interpretation, the Tanzania Fisheries Policy seeks to maximize income from the sale of fish, maximize foreign currency earning, maximize employment and maximize food supply. These to a great extent are emphasising economic capital. The major reason for this emphasis is the Nile perch fisheries which have earned the country a substantial amount of money (URT 1999, Kulindwa 2001) and so the FD wishes to sustain this income. This therefore means that the policy must address those issues which will not jeopardize it. When increases in the use of illegal fishing gears were noted, community participation was thought to be a good way to address this. These illegal gears were a threat to the incomes which were being generated. Thus by introducing the BMUs the whole idea was simply to improve conditions necessary for the earnings from the fishery. This has left out the community institutional fabric.

**Conflict resolution mechanisms followed the court system which has a number of weaknesses as opposed to local resolution of conflict which could be more effective**

The fisheries of the lake face a number of conflicts (Medard and Okeyo-Owuor 2002), among them are conflicts between gillnet owners and long liners in the lake. Normally the gillnet fishers allows their nets to drift (Tembea) and while drifting, they collect long- lines along their way, this causes a lot of problems between them. Those who can afford the Tembea fishery are the ones who have connections to the FPP. When such conflicts are taken to the courts they take a long time and in addition Tembea fishers manoeuvre their ways to win the case and even come out unrepentant.

Whereas this paper does not question the functions of the court system, it is however appropriate to point out that it is faced with a lot of challenges in its efforts to administer justice and it is a place that some people go to for winning rather than to reconcile. A reform is needed for this system. But an inherent problem which will have to be dealt with is that so long as there are multiple sources of authorities in the BMU regime where the BMUs, Village Government, District Government and the Fisheries Division are involved, conflict will always arise. It is therefore necessary to think of other means that can compliment the court system. One possible way could be the traditional authority which has been quicker in conflict resolution (Viswanathan 2003).

### **The structure of the BMU fails to assign specific duties to individual BMU members.**

Each BMU was formed with a membership of twenty members. This was further subdivided into an executive committee (5 members) and other members who could be called when there is some work or visitors to attend to. Among the other members themselves, there was no specific responsibility assigned to each one and so no one could be held individually responsible when things were observed to be going wrong.

### **BMUs are an extension of the FD**

The FD still has the authority to make all decisions and the BMUs are there to enforce the decisions made by the FD. This therefore makes them an extension of the FD. In fact a demand for payment has been made by members of these units for them to work effectively. The FD also started these groups on a wrong foot by issuing them with items that in principle were part of what they used to see Fisheries staff at the beaches use when they are on patrol. It therefore appeared from the start that they were going to be such an extension.

### **BMUs hijacked by Fish Processing Plants once given the mandate by law**

When BMUs were formed in 2000, there was no clear Act that recognized them as being part of the Monitoring and Control and Surveillance (MCS) system of the FD. The latter therefore started preparing such an Act, and it was likely to be taken to Parliament in late 2003. Such an Act would empower BMUs to undertake the MCS with the full authority of the law. Once the process of the law is complete, it has been even said that the BMUs will assume the responsibility of inspecting vehicles collecting fish from the beaches to the Plants to ensure that some level of quality is achieved.

These vehicles are owned by FPP's and have been loaned to Agents, some of whom have fishing camps. While efforts to legalise BMUs is going on, the catching sector is slowly drifting into the hands of the Fish Processing Sector through advancing loans in form of gears, boats and engines. But the operators of the vehicles are actually the owners of the fishing camps employing local fishermen. Given their influence over the local fishermen, they will change the BMUs by either becoming members or sponsoring their candidates for elections to become members and thereby take control of the BMUs. Through this way the FPP that are in the hands of foreigners (Abila and Jansen 1997) will eventually be controlling this sector.

### **Potential of BMUs curtailing access rights to the resource by the local fisheries**

Since late 1990s a new privatization process was introduced in Tanzania where even beaches were tendered to those who are able to collect taxes for the Local Authorities (local district governments). What happens in this process is that local government authorities have authority to design ways and means through which they can generate incomes from their local district resources for their operations.

This authority has led to the identification of several sources among them is fisheries. Incomes include taxes levied on traders who use local markets to sell their goods, fishers who use beaches to land their fish. In this system, beaches have been very lucrative because they have attracted so many business people. In most



beaches, there are several businesses going on. The Local Authorities therefore thought that these beaches could give them good money and so they started to privatize them.

Individuals and even BMUs were free to tender for them. Each beach has a price tag per month. When one wins the tender, what the local authority requires is that one pays the Local Authority the monthly price. How one gets this amount is by one's own design. This has seen those who have won such tenders charge literally everyone who does anything at the beach. A few local fishers who have gears and use loaned boats have been charged the same as the big fishing camps. But as these fishing camps are also growing bigger and bigger there is a potential that they will soon declare beaches their territories where if one wants to use then one has to belong to the camp or pay dearly. In this way local fishers loose access rights. In addition to this, if BMUs get into the hands of the fishing camp owners and they implement the regulations as required, then access rights will be greatly curtailed.

### **At BMU formation, inadequate time was spent in socially preparing the local committees**

One of the greatest outcries on the BMUs by those who were concerned about their effectiveness was the short time spent on their formation. As pointed out in chapter five, a one-day meeting with local communities was thought to be enough according to the FD. There were no proper preparations as to what implementing this regime should comprise besides just going straight in forming them at the beaches. The idea of pre-implementation, implementation and post implementation process proposed by Pomeroy and Harkes (2000) never found any consideration. This therefore led to incorporating people who were less socially ready for such a task. The result of it has been poor performance.

### **The push of this regime is one sided**

The FD first thought up the whole idea of the BMU system. They sat and planned for what should be done in order to have it established. They sought for funds and mobilized themselves to talk to the fishers. Once it was established, FD personnel have been leading the process. One notable thing has been the fact that this move is one sided. The fishers themselves have not come up to make their input felt, they have fallen to the move already created by the FD.

They wait until the FD instructs them on what to do. In fact during this study it was reported that one of the BMUs visited in Ukerewe had just been called to participate in an MCS organized by the FD in the Island. The one sided push on this regime creates a question on their support by the other side and therefore their sustainability. Could it be that the fishers are not in support of them despite having agreed to form the BMU? Could it be that these units did not address the fishers' expectations and therefore fishers' developed less interest in them? These are some few questions among many others that should be of concern.

### **Unclear structure and unequal distribution of incentives**

When these units were formed, there was unclear definition of incentives to the members. Later on they were asked to come up with byelaws, which could help them in introducing fines on certain petty offences such as taking a bath in the lake. Incomes generated from fines initially seemed welcome but in actuality it became

very difficult to implement such regulations let alone people caught being able to pay the fines. Thus generating incomes through fines presented a great challenge. In response to this challenge, the FD started campaigning for these units to get tenders to collect taxes at the beaches, the campaign still continues. While the campaign continues, the incentive structure still remains unclear.

### **BMUs are socio-culturally insensitive**

As already argued, the institutions which were created for fisheries had a social relations bearing, but the BMUs are directed more towards economic and natural resources. Based on this bearing, the local communities whose life is based on social relations had to negotiate their way on how to make these BMUs address their morals.

This is why they accept their formation but they choose members to these units who will promote community cultural values. This points to the fact that socio-cultural sensitive institutions have a high performance probability and can lead to successful natural resources management. This is where the fisheries management reform should zero in. The reasons for this are numerous, such institutions are useful in: facilitating flow of information among the communities; exert influence on those who make critical decisions in the fisheries; certifying an individual's social credentials by creating social networks and relations to enable community members to access the fish; and finally, they are able to reinforce identity and recognition. That is to say that they have not been able to recognize one's worthiness as an individual and a member of these communities sharing of resources, which is crucial in providing emotional support and public acknowledgement to claim the resources (Lin 2001).

### **A miscalculated entry point to the communities.**

At formation, the FD planned for the establishment of these BMUs and then asked the District Fisheries Officers of Local District Governments to identify people who could be called for a meeting to discuss issues already prepared by the FD. In other words the FD entry point was through the District Councils (here referred to as organization entry point). Other options such as village elders, opinion leaders, churches and Non-governmental Organizations could have been explored. This organization entry point only sent a message of government authority to the local communities.

While they filtered how this would affect their lives, disapproval was already in the offing when they demanded working equipment, a physical office to operate from and an incentive package. However one other option could have been to enter through community activities or festivities (here referred to as local Institution entry point). Here they could have used fishers to identify problems of the fisheries and ask them to suggest on solutions. Such an entry point has been useful and very successful in Babati Forest management in Tanzania (Alden-Wily 2001)

With these drawbacks, the only outcome for the BMUs is poor performance. In fact an evaluation of these units three to four years later found out that less than half were actually performing as expected (Onyango, Medard and Mahatane, 2002; Abila, Odongkara and Onyango-in press). In a similar manner some studies using the argument have also raised similar concerns. Westerdahl (2001) in his study on

Jämtland and twenty European co-operatives discovered that small organizations with local roots were becoming more prominent at a time when values such as size, capital returns and global presence were dominant.

The pitfalls do not imply that models or regimes which are implemented with consideration of socio-cultural conditions will not experience any challenges. The challenges will be there but at a different scale and type. Nevertheless studies elsewhere reveal that in most cases such models or regimes are successful. A few successful examples include Japanese human resources development. Robinson (2003) documents that American firms have been forced to adapt themselves to the Japanese recruitment process which is so firmly embedded in Japanese social structure and norms. Powerful American firms have had no success in bringing about change to this job market and they are only forced to conform. Those that have conformed have had good success.

Westerdahl (2001) quoting Ylva Hasselberg Swedish article Den Sociala ekonomin of 1998 where the latter writes about the Swedish Ironworks notes that ironworks survived the 19th century threats to the iron manufacturers of international competition and insufficient cost controls. This survival was because the owner of the Furudal used social capital especially his extensive network of contacts he had developed over time to increase value to the products. Therefore, BMUs would probably have experienced success if they had adopted the socio-cultural conditions of the local communities.

## DISCUSSION: LESSONS FOR CO-MANAGEMENT

To make BMUs fit local socio-cultural environment, there is a need to work towards a combination of embeddedness and autonomy of social ties both at the fishing community and government levels. At the fishing community level, embeddedness translates into integration implying bonds that are upheld within a certain community. Autonomy translates into linkage; that is up keeping of bonds with non-community members. At the government level, embeddedness translates into synergy meaning official representatives are connected to other actors in society such as FPP (State – Civil society linkage).

State-civil society relations need to be clear and dynamic for BMUs to make any economic impact. Autonomy translates into integrity meaning that government representatives and civil servants are governed by a professional ethos committing them to negotiate and pursue collective goals as opposed to narrow group interests.

For the design of co-management this implies:

- The concept co-management focuses on building relationships among stakeholders. Sharing responsibilities which is key issue in co-management is more inclined to building social relations. It is therefore important that co-managers understand this perception and build a regime that promotes it.
- A co-management regime requires a pro-target group perspective. Co-management regimes normally target fishers who are faced with difficult challenges ranging from poverty to livelihood related issues such as social services and welfare. Such challenges require socially oriented policies. It is

therefore important that co-management regimes be established on pro-target group concerns. In addition to this, co-management must encompass empowerment and improve the voice of the target group. If the voice of the group is not heard then they will unlikely not comply with what is decided.

- Co-management requires a socio-cultural fit. For co-management to be successful, it needs to be part of the fabric of community and way of doing things in the lives of individual community members. Towards this end, fisheries authorities should direct their efforts to understanding socio-cultural aspects of communities such as Traditio-cratic society and how co-management can fit in it.
- Co-management should bridge the gap between traditional and bureaucratic systems. The dilemma that faces co-management is that it has to be implemented in such a way that it empowers the local fishers and not the power elites who already have a domineering character in the fisheries. But at the same time, these power elites must not be left out otherwise they will fight co-management and not allow it to operate.
- Co-management should not be perceived as an entirely new regime. The problem with co-management has been on implementation. The way it has been implemented has made it look like a new regime which is being introduced to these communities and therefore needing new techniques. This perception is erroneous and may only lead to unsuccessful implementation. Co-management existed in these communities although not with the same name.

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Conference Paper 15



## Institutions in the Mekong Delta of Cambodia - Findings from a situation analysis

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## ABSTRACT

This paper focuses on property rights and collective action in the Mekong region of Cambodia. Institutional arrangements in water management for community-based aquaculture in two villages in the Mekong area of Cambodia are described.

The region is characterized through various forms of institutions. Various groups have access to the resources and use them in various ways at different times, which give the water resource system a multiple use character.

This paper presents a situation analysis of water management in Cambodia and starts with a general introduction into the Cambodian history of land tenure and water management. Furthermore, institutions for water management in two villages, including rules and regulation as well as water distribution patterns will be described.

Conclusions summarize the findings and show challenges for future interventions of the "CGIAR Challenge Program on Water and Food: Community-Based Fish Culture in Irrigation Systems and Seasonal Floodplains" in community based aquaculture in Cambodia.

## INTRODUCTION

In 2005, the WorldFish Center initiated the "CGIAR Challenge Program on Water and Food: Community-Based Fish Culture in Irrigation Systems and Seasonal Floodplains" in three water basins, namely the Indus-Ganges (Bangladesh and India), Niger River basin (Mali) as well as the Mekong Delta (Cambodia and Vietnam). In Cambodia, the project is managed through the Inland Fisheries Research and Development Institute (IFReDI)/ Fisheries Administration (FiA). In this context, research on institutional arrangements and technical options for community-based aquaculture is conducted in the Lower Mekong area of Cambodia. One expected output of the project is the identification of locally rooted institutional options for sharing benefits of integrating fish and other living aquatic resources (the WorldFish Center 2005).

Cambodian history evidently strongly influenced land and water tenure issues and thus collective action. In order to understand people's perceptions about water management and underlying conditions it is thus useful to consider the historical development of water and land management in Cambodia.

After independence in 1953, a general degradation of land access for Cambodians followed the initial colonial effort to privatise the traditional collective domains. Traditionally, an individual or household took what was needed for subsistence without hurting the collective rights of the community (Van Acker 1999), while the land belonged to the sovereign. During the French protectorate (1863-1953) the Cambodian Civil Code of 1920 aimed at a general registration and a national cadastre system. Thus, in contradiction to the traditional system "Kram", all unoccupied areas are considered as "free" and became available for sale.

With the launching of "Buddhist Socialism" in the mid-1960s a period of non-aligned state socialism and monopoly started. During this time, lowland Khmer were resettled and land was forcibly redistributed. Then, with the Khmer Rouge regime (1975-1979), all private property was abolished and all property records were systematically



destroyed. The entire population was marched out of cities and villages and reduced to slave labour in programs of public works and collective work-brigades (Van Acker 1999).

With the Vietnamese Invasion in early 1979, the system of the "Krom Samaki" continued with the collectivisation of property, albeit in a less forbidding format and allowing different levels of private property. In 1989, the government abolished collectivisation and reintroduced the private ownership (Van Acker 1999) and today, the decentralisation efforts of government aim at give power to lower level institutions.

Today, people are still uncertain whether their claims on property are secure, because the conflict settlement is still an ongoing process and different sources of land law are in force. Additionally, the social base in Cambodia is still fragile and makes collective action a serious challenge. Institutional structure is still underdeveloped due to the extent era of military regime and corruption and power structures characterize the people's life instead of the legal system. National policy aims at registering land titles in the near future. However, until now only a few villages in the south-western part of Cambodia hold private land titles.

## SITUATION ANALYSIS IN TWO CAMBODIAN VILLAGES

The project, CPWF PN35 is conducting research in four villages in Cambodia. Thnal Kaeng and Potamoun are located west of Phnom Penh in Prey Veng province. Pom Eith and Chrouy Poan are located in the south-western part of Cambodia in Takeo province, close to the Vietnamese border. This chapter will focus on institutions in Thnal Kaeng and Pom Eith village.

### **Water management in Thnal Kaeng**

Thnal Kaeng village in Prey Veng is located next to Boeng Khei Reservoir. Thnal Kaeng consists of 98 households and was part of an earlier CARE Cambodia rural development project which supported the establishment of a Water User Group (WUG) as well as pond culture.

The Boeng Khei reservoir in Thnal Kaeng was built during the Pol Pot Regime in 1975. In 2006, CARE Cambodia offered a Food for Work Program for the renovation of the canals as well as for the road leading south to the national road. Within this program, there were two sluices built as well.

The reservoir is an important water source for irrigation as well as for all other household activities (cooking, washing, drinking, bathing, soaking, etc.) in the village. The reservoir is 900 m wide and 2800 m long. Three sluices are connecting the reservoir with downstream canals. Two upstream canals allow water flow in for further storage. All land south of the reservoir is fed by the two canals heading south. Since 2006, two newly built sluices regulate the water flow for Thnal Kaeng and thus also influence water levels in the downstream Potamoun reservoir.



**Fig. 1. Boeng Khei reservoir, Thnal Kaeng village**

The reservoir is accessed by nine different villages from Pean Reang and Svay Chrum communes for irrigation purposes. However, about six different communes and more than 700 households have access to the reservoir and use it as a fishing ground. Thnal Kaeng village can be considered as the main user, while the village builds a strip settlement along the reservoir.

In Thnal Kaeng no cadastral survey was undertaken until now and people have no secure property rights for their land holdings. Legally, all agricultural land in the reservoir is state property and belongs to the Cambodian government and only paddy fields outside the dyke are privately owned (without land titles). People have held use rights on agricultural land in the reservoir for a long time already, but are aware of the fact that the government can claim the land back. As the reservoir usually holds water for the whole year, it is recognised as a public good, where everybody can have access during the whole year. In fact, it is an open access situation as rules and regulations concerning the resource use are not legally enforced.

In Cambodia the government established Water User Committees (WUC) on a commune level, which are responsible for water management issues in their communes. The villages in the commune are represented in the WUC through two to four village members, which were selected by the villagers. The WUC in Svay Chrum commune thus represents approximately 770 HH. In Thnal Kaeng the village head as well as another villager are the representatives in the commune-wide WUC, which has only operated since 2006. The WUC is lead by the commune head. On a village level the village head leads the Water User Group on the village level (WUG) established by CARE Cambodia. There are six Kroms<sup>1</sup> in Thnal Kaeng, with each Krom leader being represented in the WUG.

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<sup>1</sup> A Krom is an administrative entity underneath the village level. All villages in Cambodia are further divided into several Kroms with each having his own Krom leader

Water is used according to needs. Villagers must request that the sluice is opened (or closed) to the WUC, the WUC will inform the village chief of Thnal Kaeng village and he will then operate the sluices according to the order of the WUC. This procedure is the same for all villagers further downstream as well. When the southern Potamoun reservoir is not having enough water for irrigation, the villagers will ask that the Thnal Kaeng village chief is informed, who will then open the sluice and let water flow into the downstream reservoir. This is usually requested twice a week.

There are rules and regulations concerning the use of the water resource according to national policy. Thus, there are restrictions on the type of fishing gear, whereby electrical fishing gears as well as fine mesh nets are not allowed to be used. Furthermore, there is a restriction on the size of gill nets, seine nets and arrow shaped trap nets. There are no rules concerning the amount of fish that can be taken out as well as no time or fishing area restrictions.

People are informed about new rules through the Commune Fisheries Office and the police. There are no written rules and regulations, but there are village meetings, where the advantages of rules and the penalties are explained to the villagers. During these meetings the use of legal fishing gears is also explained. These meetings are once or twice a month.

The Commune Fishery Office and the police are responsible for monitoring, exposing and fining the use of illegal fishing gears. Thus, the village head does not have the legal right to fine the offenders, but he reports his observations to the commune head and the police. Because of the size of the water resource, offenders are seldom caught.

### **Water management in Pom Eith**

Pom Eith today consists of 133 households. In 1973, the villagers were forced, by the Khmer Rouge, to move away from the village and they had to live next to the mountains nearby. In 1975, the villagers moved back to the village. The village has access to Tunloub reservoir, which is southern-west part of a larger system of a total four reservoirs north of the village. All together there are five communes using the water from the reservoir, and there are nine villages alone in Prey Ampok commune.

On the eastern side the reservoir is bordering the national road No.2; built in 1976-1978 heading from Phnom Penh southwards to Vietnam. The road thus separates the paddy fields lying west of the road from the direct use of the reservoir, but farmers owning these fields are connected to the reservoir through a sluice. There are five sluices and one culvert, which were renovated in 2004.

The reservoir is used for rice cropping as well as for fishing and other household activities like bathing, draining animals, drinking water, washing, etc. It is fed through rain water as well as through the Mekong River which starts swelling soon after the rainy season started. All agricultural land lies in the reservoir. On average people in Pom Eith have five different plots.

After the Pol Pot regime, when land was collectivized, the village experienced another expropriation in 1983/84, where land became public property again. In 1989, government then abolished collectivization and redistributed land to private owners. In 2006, a cadastral service was undertaken in Pom Eith, thus it is one of the first villages that were able to officially register their private land titles.



**Fig.2. Tunloub reservoir Pom Eith, village**

However, the water resource faces an open access situation during wet season, which starts in June. Everybody, including non-community members is allowed to use the reservoir for their own purposes and come for fishing. There is no restriction on the amount of fish caught; however the use of illegal fishing gears such as electric fishing gears or fine mesh nets is prohibited. The Kiri Vong District police officer is in theory responsible for monitoring of and imposing fines on people using illegal fishing gears. However in practice, the monitoring of illegal fishing in this area stopped in 1996.

Similar to Thnal Kaeng, there are also meetings in Pom Eith organised by the commune head and the fisheries officer in order to introduce new rules and regulations to the villagers. Villagers are not involved in any decision making about rules and regulations, they are only informed by the fisheries officer.

There is a Water User Committee (WUC) in the Prey Ampok commune as well as a Water Resource Office (WRO) on district level. It is the WRO who decides about the management of the sluices. When villagers want sluices to be opened or closed they have to ask the WUC, which then will ask for permission from the WRO to open and close it.

In the reservoir there is no regular monitoring of water quality, fish abundance or the use of illegal fishing gears. The village head himself has no legal authority, but is supposed to report to the commune head, when he observes someone breaking the rules. Only the fishery officer and the police are allowed to sanction and are

supposed to coordinate their activities. However, villagers report that the use of illegal fishing gears can be regularly observed.

## CONCLUSIONS

Cambodia has a wide variety of water rights systems and a wide variety of water allocation systems in local areas. Property rights change according to the season and land is considered to be private land during dry season and public land/open access during wet season. The two reservoirs do not possess clearly defined boundaries.

Although the Cambodian government established Water User Committees, not all water users of the water resource are represented in the same institution. Thus, inter-commune coordination becomes a serious challenge, although the water resources in Cambodia are most often shared between communes. In Thnal Kaeng, two communes share the same reservoir, but they are not represented in the same committee and there are not meetings in order to coordinate water management between the two communes. Similarly, not all downstream user villages are represented in the committee. They are again represented in another WUC and there are no meetings held for super-coordination between these committees.

There are no formal or informal institutions concerning the coordination of fishing activities and the access to fishing grounds on a local level. Although, there are restrictions on the type of fishing gears, the amount of fish and time spent fishing is not restricted. Furthermore, there are no rules protecting breeding areas. The existing rules and regulations are not written down and the information of villagers about new rules seems to be very informal and spreads through mouth-to-mouth propaganda. Villagers in Pom Eith reported that they feel confused about and even threatened through the penalties they are informed about.

The monitoring, exposing and fining of the use of illegal fishing gears through the Commune Fishery Office and the police must be considered as ineffective as villagers report regular illegal fishing practices. Usually, people are aware of the number and people who use illegal fishing gear, but face difficulties to convict the offenders due to a lack of presence of responsible staff as well as due to a fear of revenge.

The CPWF PN35 faces several challenges in future project implementation. An in-depth analysis of local level institutions in fishing and water management is necessary in order to better understand the different local water user schemes. Broad based analyses will be necessary to understand by whom and how the resources in rural areas are used and more applied research is advisable to better understand the complex livelihood strategies of the poor and the key role of land (Kirk 2004).

Collective action can be considered as a new model for Cambodia fish culture and thus small-scale approaches might be appropriate in order to avoid more complex coordination problems within the groups. During the Khmer Rouge regime, Cambodians were forced to work collectively, but never appropriate a benefit from this collective work. Thus, "real incentives" for investments in a common good and collective action must be created.

However, most important will be the facilitation of community-based aquaculture on a local level as well as a long-term support through several institutions. Rules and regulations as well as monitoring/sanctions systems must be established by the resource users. Furthermore, conflict resolution mechanisms will be necessary and must be developed over time. Adaptive learning should be the main component in project implementation as experiences in collective action are low at a local level in Cambodia and the possibility to learn and develop community-based action should be encouraged and facilitated on a long-term basis.

It will also be essential to create linkages to other (higher level) institutions, embedding local institutions in a framework of governance, in order to ensure high level support for a sustainable collective management of local water resources in Cambodia.

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Conference Paper 16

## Utilization of wetland ecosystem through fish-crop diversification for enhanced productivity and economic stability for the fish farm community of the Indian sub-continent

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## ABSTRACT

The extensive wetland ecosystems intersected with the main river systems of the Ganges, Brahmaputra, Padma, Mahanadi, Mahananda, Rupnarayan their tributaries and associated water bodies like oxbow lakes (mauns, chauras, jheels, beels, baors and nayanjali) are immensely valuable for a wide range of fish species, nutrient-rich aquatic food crops and offer possibilities for integrated fish-crops.

This paper deals with a number of case studies that were undertaken during the last 8-10 years in utilizing divergent 'Tal' wetland ecosystems (deep, semi-deep, temporary in a range of agro-ecological zones like NAZ, OAZ and Coastal Zone of the region) for the development of integrated management programmes using a range of approaches. These included (i) system approach (excavation & renovation, methodological approach), (ii) management (fish-crop management, inter & post-harvest care & processing, marketing), (iii) integrated natural resource management utilizing organic as well inorganic sources, and (iv) low-cost fish-feeds, based on fish-crop diversification.

This paper also deals with some endangered indigenous fish species. The unique approach of watershed plans (*bherri* system), which were formulated for upright production systems, was economically successful. Economic indicators reveal there were comparative advantages of mixed farming systems compared to monoculture, exhibiting >2.5 fold gains even for resource poor fish farming families.

## INTRODUCTION

Vast wetland ecosystems, especially in the north-eastern part of India are immensely valuable for the production of aquatic crops, fish and integrated aquatic crops as well as many other beneficial aquatic flora and fauna. Wetlands are environments that are subject to permanent or periodic inundation or prolonged soil saturation sufficient for the establishment of hydrophytes and/or the development of hydric soils or substrates. They are the transitional phase between dry terrestrial and permanently aquatic ecosystems, where the soil is frequently waterlogged, and the water table is at or near the surface. The land is often covered by shallow water, which exists either permanently, semi-permanently or temporarily. Some common wetland types include marsh, fen, wet meadow, swamp, bog, muskeg, wet tundra, tidal flat, river bottom, lowland, mangrove forest, tropical rainforest and floodplain swamp (Tiner, 1993).

Land which is subject to prolonged flooding during the rainy season, is known in West Bengal as 'Tal' lands. These are low-lying flood plains including back water swamps and are mainly comprised of flat alluvial plains intersected with the main river systems (Ganges, Brahmaputra, Padma, Mahanad, Mahanadi, Rupnarayan etc.) and its many tributaries and canals covering around 300,000 ha.

The Ramsar Convention held in Iran in 1971, brought the subject of wetlands to the International arena, and highlighted and accepted a treaty on 'Conservation and Wise Use of Wetlands' (Navid, 1988). Wetlands comprise 6.4 per cent (855.8 million ha) of the world total area (Maltby and Turner, 1983) of which 23.5 million ha are in India, mostly in north-eastern and coastal parts of the country (Anonymous, 1986). The survival of human civilization has also been inextricably linked with wetlands.

Wetlands are continuously enriched by the addition of large quantities of biomass and the soil is enriched in consequence (Matsuo *et. al*, 1979, Seki *et. al*, 1979, Tsuchiya



and Iwaki, 1979 and Yamamoto and Seki, 1979). These are mucky in nature, grey to blackish-grey in colour, sometimes partially decomposed due to anaerobic condition. The soil status may further be improved if a period is allowed for quick decaying during post-wet months under aerobic condition. In this region, one of the most conventional practices by the farmers is to utilize this resource-rich humus soil for production of succeeding arable crops. This practice not only saves a substantial amount of fertilizer including other important essential elements but also improves the physical condition of the soil (Puste and Das, 2001).

Wetlands are highly exploited. The development and management of wetlands should form an important part of integrated watershed management plans. Swampy, fertile, productive wetlands are continuously used by the rural farmers for production of fish, aquatic food crops (deep water rice, water chestnut, makhana, water lily, Royal water-lily, *Colocasia* spp. etc.) and non-food crops (*Cyperus* spp., *Typha* spp., *Clinogyne dichotoma*, *Aeschynomene aspera*, *Brachiaria mutica*, *Coix* spp. etc.), as well as ornamental and beneficial medicinal plants.

To meet the challenge of sustaining food security and economic returns for the poor and marginal farmers, it is necessary to develop improved farming systems with diversified production systems. This can ensure higher and more stable farm productivity, income and year-round employment opportunity without degrading the environment. This can generate up to 2-3 fold income gains compared to current systems and has the following advantages:

- There is a synergistic effect of fish on aquatic food crop production.
- The control of aquatic weeds and associated insects by fish.
- Increased efficiency of resource utilization, reduced investment risk through crop diversification and additional sources of food and income.
- More frequent visits to the field particularly for fish by the farmers, resulting in better crop management.
- Low risk for poor water chestnut and makhana growers with modest capital investment.
- Year round employment opportunity for the farming family.
- Improvements in farm family income and nutrition levels.

## THE INTEGRATED APPROACH: FISH-CROP DIVERSITY

Indigenous, energy rich, air-breathing live fish like Shoil, *Channa striatus*; Taki, *C. punctatus*; Gajar, *C. marulius*; Magur, *Clarias batrachus*; Singi, *Heteropneustes fossilis* and Koi, *Anabus testudineus* are most important. Besides, *Chanda ranga*, *Chanda nama*, *Punctius ticto*, *Punctius sophore*, *Punctius sarana*, *Colisa pectoralis*, *Colisa fasciata* including Indian major fresh water carps like Rohu (*Labeo rohita*), Katla (*Catla catla*) and Mrigal (*Cirrhina mrigala*) are also important. These were used successfully under integrated systems as they can fetch higher market prices because they are preferred by most of the common people, particularly in village and urban areas. The introduction of fish along with deep water rice in waste wetland ecosystems is common for the utilization of food and total productivity (Grist, 1975, Ghosh, and Saha, 1980, Dutta et. al, 1984, Jhingran, 1991 and Puste and Bandyopadhyay, 2000) as well as for improving soil fertility by grazing on aquatic biomass and contributing through their faeces to nitrogen accumulation in soils (Brahmanand and Mohanty, 1999 and Bandyopadhyay and Puste, 2001).

There appears to be very limited or no information available on the evaluation of integrated systems involving fish and aquatic food crops such as water chestnut and makhana. To address this, a number of farmer level case studies were undertaken through Government sponsored research projects in pond systems during, before and after the monsoon period. [I.C.A.R., Indian Council of Agricultural Research; NWDPR, National Watershed Development Project for Rainfed Areas; TDEP, Technology Development and Extension Project of Department of Land Resources (DoLR); FPIH, Food Processing Industries and Horticulture etc.]

### **Importance of aquatic food crops other than rice**

Makhana or fox nut (*Euryale ferox* Salisb.), family - Nymphaeaceae and water chestnut (*Trapa bispinosa* Roxb.), family Trapaceae or Onagraceae are annual floating-leaved herbs. They are important, familiar and nutritious aquatic food crops grown in diverse areas from the tropics to sub-tropics. The fresh immature kernels of water chestnut fruits are used as a popular and nutritious food in raw or cooked form. Similarly, mature makhana kernels possess a high nutritive value and are rich in carbohydrate (76.9%), protein (9.7%), minerals (1.3%) and fat (0.1%). They are used in milk puddings, sweetmeat dishes, vegetable curry and are also sold in a costly popped form, which is being exported to foreign countries.

## METHODOLOGY

The present study had been conducted under in a range of different ecosystems including new alluvial soils, old alluvial soils as well as coastal zones with the objectives of disseminating the results of research on aquatic crop-cum-fish culture production systems. The pilot studies used an extensive system approach in wetland ecosystems in trials carried out at research stations to choose best one. This involved some excavation to create suitable water bodies called the *Bherri* system (Fig.1 & 2), because of their divergence as well as their production potential.

The objective was to find suitable zone-specific techniques for large-scale implementation at the farmer level as 'On farm demonstrations'.

The main research areas were:

- Suitable planting varieties of aquatic crops adjusted with fish genotypes in integrated system,
- Integrated nutrient management systems (low-cost plant as well as improved fish-feed) sustainable for optimum production, and
- General management (fish-crop management, post-harvest care and processing, marketing etc.).

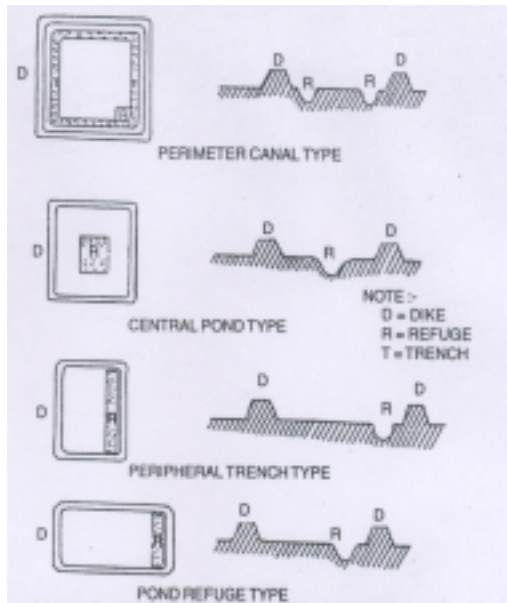


Fig.1 Different types of pond-refuges/bherii system

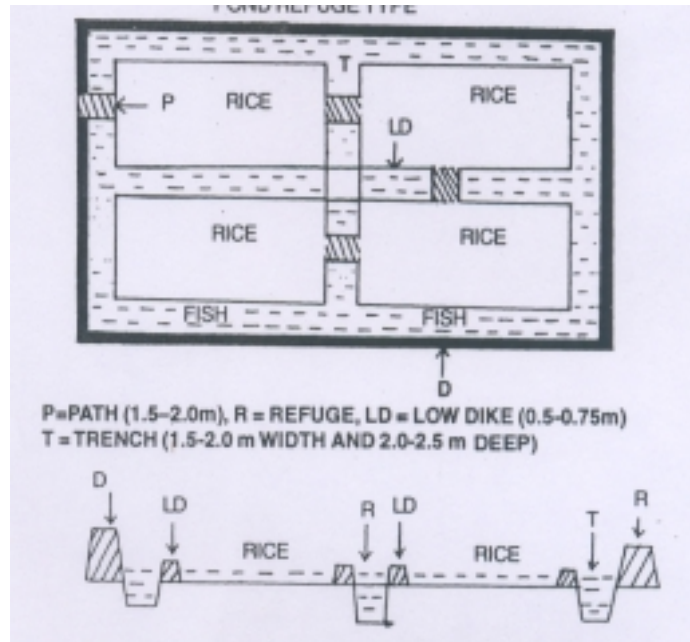


Fig.2 Field diagrams of combined fish-cum-rice/other crop culture

The work involved the NGOs, WATER, Sarvodaya, Taldi Netaji Sangha. Before on-farm demonstration trials, information was collected on background characteristics of the respondents and their socio-economic status in each of the zones. The field project trials were launched through an extension programme in each zone.

The main farming systems tested were:

- Major aquatic food crops – monoculture of water chestnut and makhana
- Rice-cum-fish culture
- Aquatic food crops (water chestnut and makhana)-cum-fish variables, and
- Aquatic food and non-food crops (mat-sedges)-cum-fish in a 3-tier system.

The trials were undertaken mainly during pre to post-monsoon season. In the monocultures both water chestnut and makhana were transplanted with spacings of 1.5 m x 1.5 m row to row and plant to plant apart, and fish fingerlings were stocked at 6,000 fingerlings/ha. In integrated systems, plants were spaced at 2.0 m x 2.0 m row to row and plant to plant apart, fish were allowed to occupy 75% of the main plot and were stocked at 4,500 fingerlings/ha. Makhana was transplanted during the first week of April (in 50 cm of water depth), while, water chestnut was transplanted in the first week of July (70 cm of water depth due to accumulation of rainwater).

All fishes were stocked during the second week of July after initial establishment of both crops. Seedlings of both the crops were transplanted with 2-3 plants/stool. For fertilization, crops received N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O @ 20 : 30 : 20 kg/ha, as a basal application. A foliar application of a zinc based micronutrient (Chelamin) was also used and NPK was applied at 20 day intervals from 30 days after transplanting up to mid-November.

Fish fingerlings were stocked at 6 g at the time of release. They were fed powdered mustard oilcake and rice husk (1:1 ratio) at a rate of 6 times the estimated body weight of the fish at weekly intervals in monoculture systems, reduced to 75% of this amount in combined crop-fish treatments. Occasionally animal protein (e.g. fish-meal, silk-worm cocoons when available) was added to the fish feed. In all cases an extra 15% of fingerlings were stocked to allow for mortalities. A borderline area of 0.75 - 1.00 m of

each individual plot was maintained as free water surface for easy movement of fishes as well as for feeding.

Water chestnut is consumed as immature fresh fruit with picking starting from September and continuing up to the first fortnight of December. Makhana seed kernels and fish were harvested at the end of December and April to May (at least 2 times) depending on the depth of submergence.

For ease of comparison among the different types of fish and crops, all the variables were converted to makhana yield equivalent (MYE) in terms of production (t/ha), according to the following formula:

$$\text{Makhana yield equivalent (t ha}^{-1}\text{)} = \frac{\text{Market price of the crop/fish to be compared (Rs.)}}{\text{Price of the makhana t}^{-1}\text{ (Rs.)}}$$

For calculation of MYE, Gross Monetary Return, Net Profit and Benefit-Cost ratio, the following market prices in table 1 were used.

Table 1. Market price of water chestnut, makhana and different type of fishes

Items	Price (Rs. t <sup>-1</sup> )	Price (US \$ t <sup>-1</sup> )
<b>Fish</b>		
Magur	1,50,000	3,260.9
Singi	1,40,000	3,043.5
Rohu	60,000	1,304.3
Katla	55,000	1,195.6
<b>Aquatic food crops</b>		
Water Chestnut	6,000	130.4
Makhana	30,000	652.2

The treatments applied included:

FG1: Fish species stocked - Magur, Singi, Shoil, and Gajar and

FG2: Fish species stocked - Rohu, Katla, Mrigal and Silver carp

F1: powered mustard oilcake + rice husk in 1:1 ratio,

F2: neem oilcake,

F3: poultry droppings + cowdung (1:1)

F4: without fish-feed (although very small amounts applied when available to the farmers as in local practice).

These were applied in 4 village based clusters with the aim of developing centres for further dissemination of new technologies on fish production as well as quality of produce (Puste and Basu, 2004). Initial soil samples were collected at every set of individual studies following standard analytical procedures (Jackson, 1973).

## RESULTS

### Individual fish yields

Individual fish yields in clusters I & II in both groups performed comparatively less well compared to clusters III & IV, perhaps because of water quality and the depth of submergence of the respective ponds. It is more contrasting and comparable enough

with the local practice. The magnitude of yield increases in all the individuals were around 46 to 78 per cent, with the highest rises in production of Magur, Singi, Mrigal and Silver carp (Table 2). A significant price difference was noted between local markets and zonal trade centres. In most cases, fish farmers sell their output directly to the middlemen in the trade centres, with reasonable profit margins.

Table 2. Individual fish yield and their price

Variables	Av. yield (t ha <sup>-1</sup> )						Av. price of fishes (Rs. t <sup>-1</sup> )	
	Cl. I	Cl. II	Cl. III	Cl. IV	Av. yield	Av. local yield	Local market	Zonal trade
FG1								
Magur	0.57	0.59	0.68	0.64	0.62	0.38	1,30,000 (2,826.1)	1,50,000 (3,260.9)
Singi	0.52	0.56	0.62	0.58	0.57	0.32	1,20,000 (2,608.7)	1,40,000 (3,043.5)
Shoil	1.32	1.38	1.46	1.52	1.42	0.96	1,10,000 (2,391.3)	1,30,000 (2,826.1)
Gajer	1.38	1.44	1.50	1.52	1.46	0.92	1,10,000 (2,391.3)	1,30,000 (2,826.1)
FG2								
Rohu	1.14	1.19	1.27	1.24	1.21	0.83	50,000 (1,086.9)	60,000 (1,304.3)
Katla	1.28	1.35	1.43	1.38	1.36	0.86	40,000 (1,086.9)	55,000 (1,195.6)
Mrigal	1.09	1.15	1.26	1.22	1.18	0.68	40,000 (1,086.9)	50,000 (1,086.9)
S. carp	1.18	1.26	1.39	1.33	1.29	0.74	40,000 (1,086.9)	45,000 (978.3)

Av., average; Cl., cluster; Parenthesis indicates US\$ (1US \$ = INR 46.00)

#### Group fish yield

Application of fish feed (powdered mustard/groundnut oilcake + rice bran) had a strong influence on fish yields, as practiced in farmers' fish ponds in different villages of the zones. Almost all the feed items were more or less equally effective for such increment of fish yield and it significantly differed from control pond, where no food was applied (Table 3). The increase in production was 82.2 to 116.4% in FG1 and 98.5 to 131.0%, in FG2. However, among the 3 fish-feed materials the highest results were obtained with F1 (powered mustard oilcake + rice husk in 1:1 ratio @ 6 times body weight of fish at weekly interval), although the difference was not statistically significant. The practice of fish feeding was quite effective in increasing fish yields irrespective of fish type in the 4 different clusters of the zones (Puste and Basu, 2004).

Table 3. Fish yield in groups as influenced by fish-feeds

Variables	Cl. I		Cl. II		Cl. III		Cl. IV		Av. of clusters	
	FG1	FG2	FG1	FG2	FG1	FG2	FG1	FG2	FG1	FG2
Fish feed										
F1	1.02	1.28	1.19	1.34	1.21	1.33	1.18	1.32	1.15	1.32
F2	1.00	1.22	1.12	1.18	1.18	1.26	1.15	1.21	1.11	1.22
F3	1.04	1.18	1.13	1.22	1.12	1.24	1.09	1.22	1.09	1.21

F4	0.56	0.59	0.55	0.58	0.64	0.67	0.61	0.64	0.59	0.62
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## CONCLUSION

India is endowed with vast and varied inland water resources. The share of total fish catch caught in inland waters has increased over the years from 29 per cent in 1950-'51 to over 49 per cent in 2001 (Ayyapan and Venkateshwarlu, 2002). Carps in freshwater aquaculture and shrimps in brackish water aquaculture have mainly contributed to the increased quantity as well as value of the inland aquaculture sector.

The vast wetland ecosystem may effectively be utilized through the cultivation of so many aquatic crops and fish which are not only valued by human beings but are also important for the upliftment of the resource poor rural economy.

## ACKNOWLEDGEMENT

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A green horizontal band with silhouettes of people and a heart. The silhouettes are in a darker shade of green, and the heart is a lighter shade. The background of the entire page is white with horizontal lines.

## Micro-enterprise Development in Selected Fishing Communities in the Province of Iloilo, Philippines

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## ABSTRACT

The Food and Agriculture Organization of the United Nations provided funding in support of the development of micro-enterprises in Banate Bay, Iloilo and Southern Iloilo. This project was implemented by the University of the Philippines in the Visayas in coordination with the Banate Bay Resource Management Council, Inc. and the Southern Iloilo Coastal Resource Management Council.

The following micro-enterprises were developed in the various municipalities of Banate Bay and Southern Iloilo: Anilao –fish balls production; Banate – fish vending; Barotac Nuevo –shrimp paste production; Barotac Viejo – oyster and mussel culture; Guimbal – fish vending; Miagao – salt iodization; Oton – fish vending; San Joaquin – fish sauce production; Tigbauan- shrimp paste production.

Training programs were conducted for the beneficiaries to improve the operation of their micro-enterprises, on product development and marketing of their products. Coordination with local government units, active participation of the stakeholders and conduct of appropriate training were considered necessary for the sustainability of these micro-enterprises.

## INTRODUCTION

The coastal zone plays a very significant role in the Philippine economy and the lives of Filipinos. It is a source of food, shelter and livelihood of numerous inhabitants residing in the coastal area. The importance of the coastal zone in the Philippines can be seen in the following facts; more than 50% of animal protein intake of Filipinos is derived from marine fisheries, 62% of the population lives in the coastal zone, almost all major cities and 54% of the 1,541 municipalities in the country are coastal (DENR et al, 2001a).

The Philippine coastal zone, however, is confronted with numerous challenges like overexploitation of resources, degradation of coastal habitats and poverty of the fisherfolk. With regard to the production from marine capture fisheries, empirical studies have shown evidence of biological and economic overfishing in both pelagic and demersal fish stocks (Dalzell et al, 1987; Trinidad et al, 1993; Barut et al, 2003; Barut et al, 2004). The degradation of coastal habitats has been documented for coral reefs where more than 70% of the reefs have been subjected to damage (Gomez et al, 1994) while the forested mangrove area has decreased from 450,000 ha in 1918 to 120,000 ha in the late 1990s (DENR, 1988; 1998 as cited in DENR et al, 2001a). The deteriorating resource base has caused a decline in the economic condition of small-scale fishers in which an estimated 80% of fisherfolk households are living below poverty threshold (PRIMEX, 1996 as cited in Cruz-Trinidad, 2003).

Integrated coastal management (ICM) has been recommended to address the many problems in the coastal zone (Cicin-Sain and Knecht, 1998; Courtney

and White, 2000; DENR et al, 2001b). ICM is a comprehensive and integrated approach involving multi-sectoral collaboration and community participation for the sustainable use, development and protection of coastal and marine areas and resources. The overall goal of ICM is to improve the quality of life of human communities who depend on coastal resources while maintaining the biological diversity and productivity of coastal ecosystems. An important component of ICM is the provision of supplemental/alternative livelihoods or the diversification of the sources of income through development of micro-enterprises in order to alleviate the poverty of small-scale fishers (IIRR, 1995; Luna et al, 2004). Supplemental or alternative livelihoods could lessen the pressure on coastal resources and improve the economic condition of the fisherfolk

In the Philippines, micro-enterprises and small enterprises play an important role in creating jobs and providing income to the majority of Filipinos. Micro-enterprises are businesses that have assets below Php3 million employing less than 10 people while small enterprises have assets between Php3 to 15 million employing 10 to 99 people. In 2004, there are about 820,960 operating business establishments in the Philippines generating 6 million jobs; 91 percent of these businesses are classified as micro-enterprises and small enterprises and employing 62.5 percent of the total labour force (DTI, 2004).

The Philippine government believes that micro- and small enterprises could be an effective tool for providing employment, alleviating poverty in the rural areas as well as in advancing the country's economic development (NEDA, 2004). Micro-enterprise development has been found to work well with people having no or very little access to the traditional banking sector such as farmers and fishers. Having no means to access large amounts of start-up capital, these marginalized people have to work with a meagre resource coming from their personal savings or from an alternative creditor. This process teaches them to save and become self-sufficient while earning additional income at the same time.

## THE MICRO-ENTERPRISE PROJECT

Technical Project RA 233A2 of the Food and Agriculture Organization of the United Nations (FAO) aims to promote the contribution of small-scale fisheries to poverty alleviation and food security. FAO has been assisting selected coastal resource management councils in the Philippines in the development and use of demographic indicators for the identification of crucial socio-economic issues in the coastal areas and monitoring the impact of management measures on the social and economic status of the fisherfolk. One crucial issue identified with the help of these indicators is the need for promotion of sustainable micro-enterprises and the introduction of related extension services and microfinance support. This livelihood project addresses this crucial issue through the development of micro-enterprises for selected groups of fishers.

FAO provided funds to Banate Bay Resource Management Council Inc. (BBRMCI) and Southern Iloilo Coastal Resource Management Council

(SICRMC), in close cooperation with the College of Fisheries and Ocean Sciences of the University of the Philippines in the Visayas (UPV), to support activities on livelihood opportunities and related microfinance needs. Specifically, the project implemented the following activities:

- a) Identification of livelihood and micro-enterprise opportunities for fishers within the jurisdiction of BBRMCI and SICRMC in the province of Iloilo;
- b) Conduct of on-the job training of fishers in micro-enterprise development in aquaculture, fish processing and fish marketing; the preparation of business plans; the proper use of credit and microfinance facilities; as well as provision of extension services in support of these micro-enterprises.

It is hoped that outputs from this project will be used in the development of micro-enterprises in other parts of the Philippines and in areas where integrated coastal management is being implemented.

## COASTAL RESOURCE MANAGEMENT COUNCILS

Coastal Resource Management Councils (CRMC) have been established by local government units in the Philippines to improve the protection and management of coastal resources. The institution of CRMCs has legal support and is encouraged in Philippine laws such as the Local Government Code of 1991 and the Fisheries Code of 1998. The CRMC has been established by several municipalities to better manage large bodies of water in which these municipalities have jurisdiction or in areas with long contiguous coastline. There is an advantage in having a CRMC because several municipalities can pool their meagre funds in protecting their fishery resources. The CRMC can eliminate boundary disputes among municipalities because their municipal waters are combined together and treated as a single management unit. Two CRMCs, the Banate Bay Resource Management Council Inc. (BBRMCI) and the Southern Iloilo Coastal Resource Management Council (SICRMC) were selected to participate in the micro-enterprise project. These two CRMCs have been active in implementing projects that are beneficial to the fisherfolk within their jurisdiction.

### **Banate Bay Resource Management Council, Inc.**

The Banate Bay Resource Management Council, Inc. (BBRMCI) was initiated by Mr. Ramon Antiojo, who was then mayor of the municipality of Anilao in the Province of Iloilo. The municipality, similar to most coastal areas in the Philippines, is confronted with problems of overexploitation of fishery resources, destruction of coastal habitats, illegal fishing activities and poverty of small-scale fishers. Mayor Antiojo's awareness of the need for coastal resource management and the passage of the Local Government Code of 1991, which provided more powers and authority to the local government, encouraged him to form a coastal resource management council together with the nearby municipalities of Barotac Nuevo and Banate. A series of consultations and dialogues started in November 1995 which culminated in the signing of a memorandum of agreement in February 1996 in which the Banate Bay Resource Management Council, Inc. (BBRMCI) was established (Fig.1). The municipality of Barotac Viejo later joined BBRMCI.

BBRMCI has a Board of Trustees (BOT) composed of the three mayors, an executive director, heads of operational units, representatives of municipal offices such as the municipal legislative body, municipal planning office, municipal fishery office and other representatives from the provincial legislative body, Bureau of Fisheries and Aquatic Resources (BFAR), and non-government organizations (NGOs) in the participating municipalities. The Board is the policy-making body of the Council and has been tasked to prepare an integrated management plan of the bay, and promulgate rules and regulations for the preservation and utilization of the fisheries and marine resources of the bay. The Chairman heads the BOT and presides over its meetings. The Executive Director executes the policies and rules of BBRMCI and is responsible for its day to day affairs. BBRMCI has six operational units that facilitate the implementation of the programs and projects of the Council. Each participating municipality appropriates funds for the operation of the BBRMCI.

BBRMCI has been responsible for conducting a series of information campaigns on better management of the bay and organizing the fisherfolk into associations and cooperatives. It was also able to implement an integrated zoning plan for Banate Bay and organized the Bantay-Dagat, a community-based law enforcement unit, which implemented the unified fishery ordinance for the bay. BBRMCI also coordinated with different government agencies for the establishment of livelihood programs. In 1998, BBRMCI won the Galing Pook Award, a project of the national government and private sector, for its excellence and innovation in local governance.



Fig.1 Location of the BBRMCI

### **Southern Iloilo Coastal Resource Management Council**

The Southern Iloilo Coastal Resource Management Council (SICRMC) was started when the University of the Philippines in the Visayas (UPV) and the mayors of five coastal municipalities, namely; Guimbal, Miagao, Oton, San

Joaquin and Tigbauan, signed a Memorandum of Understanding in April 2001 to cooperate towards the sustainable development of coastal resources in Southern Iloilo. UPV, through the College of Fisheries and Ocean Sciences - Institute of Fisheries Policy and Development Studies (CFOS-IFPDS), assisted the local government units (LGUs) in the establishment of baseline data on resources and users of the coastal area. The CFOS-IFPDS also assisted in the formation of a technical working group from the LGUs in preparation for the establishment of a coastal resource management council.

UPV also provided technical assistance in the formulation of a coastal resource management plan for Southern Iloilo. It also pledged to coordinate with LGUs, government and non-government agencies in the planning, implementation and monitoring of the coastal resource management plan of Southern Iloilo. On the other hand, each LGU assigned two personnel for the technical working group and gave full support for the planning and implementation of a coastal resource management council and a coastal resource management plan.

On February 10, 2002, a Memorandum of Agreement was signed by the mayors of the municipalities of Guimbal, Miagao, Oton, San Joaquin and Tigbauan creating the Southern Iloilo Coastal Resource Management Council (SICRMC) (Fig.2). The objectives of the Council are; to help in the restoration of the productivity of the coastal waters of Southern Iloilo, strengthen the capabilities of the local government units in the management of their coastal resources, educate the fisherfolk in the sustainable utilization of their coastal resources, and develop and promote alternative livelihood schemes for the fisherfolk.

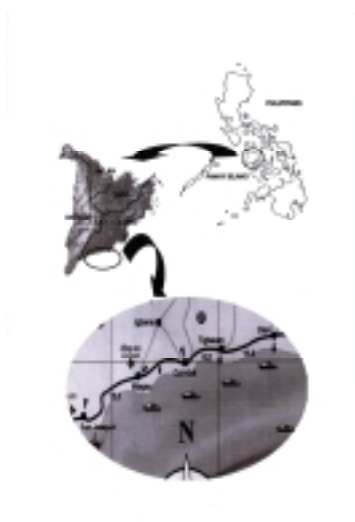


Fig.2 Location of SICRMC

## DEVELOPMENT OF MICRO-ENTERPRISES

The project was started through consultation with the officials of BBRMCI, SICRMC and local government units to determine the barangay (village) and beneficiaries which will be involved in the micro-enterprise development. The

approach is to develop at least one micro-enterprise for an organized group which will serve as a model in the municipality. The beneficiaries that were identified as participants are shown in table 1. This was followed by a series of meetings with the beneficiaries on what kind of micro-enterprise they want to get involved with and the support they needed for the livelihood project.

Table 1. Beneficiaries and micro-enterprises in each Municipality

<b>Municipality</b>	<b>Participants/Beneficiaries</b>	<b>Micro-enterprises</b>
Anilao	Anilao Fish Processors Association	Fish Balls Production
Banate	Poblacion Fish Peddlers Association	Fish Vending
Barotac Nuevo	Lamintao Fisherfolk Association	Shrimp Paste Production
Barotac Viejo	San Francisco Small Fishermen Association	Oyster and Mussel Culture
Guimbal	Cabasi Fisherfolk Association	Fish Vending
Miagao	Miagao Salt Producers Association	Salt Iodization
Oton	Alegre Fish Vendors Association	Fish Vending
San Joaquin	Sumakwelan Fisherfolk Association	Fish Sauce Production
Tigbauan	Barangay Council of Bgy. Atabayan	Shrimp Paste Production

The choices of micro-enterprises were influenced partly by their respective LGU development plans that focus on the utilization of the municipality's major products or harvests. The major factor for their choice, however, was the low level of risk, because most of the identified micro-enterprises already existed and the beneficiaries were familiar with the activities associated with them. The task for the beneficiaries was to enhance or innovate and look for new markets for their improved products.

## TRAINING PROGRAMMES FOR PROJECT BENEFICIARIES

The training sessions focused on building the capacity of the beneficiaries in starting and operating their micro-enterprises, developing skills in product development and training in expanding markets for their products. The training sessions were based on the needs of the beneficiaries which were expressed during the consultation meetings, as well as from the recommendations of the technical consultants assigned to each micro-enterprise. A pool of consultants and resource persons from the University of the Philippines in the Visayas (UPV) and from the local government units were used for these training courses. The training program can be grouped into; a) Operation of Micro-enterprises, and b) Product Development, although not all beneficiaries were able to avail of these training courses due to limitation of time and resources.

## **Training on the Operation of Micro-enterprises**

### *Starting a Small Business*

A one day training-workshop on starting a small business enterprise was conducted by Prof. Benmar Panaguiton, Assistant Professor of UPV College of Management and Director of UPV Office of Extension and Pahinungod for the Anilao Fish Processors Association. The workshop tackled the different aspects of a business – marketing, production, management and financial aspects – with a simple business plan as the final output. One of the objectives of the workshop was to introduce the beneficiaries to the rewards and risks of being an entrepreneur. To make them aware of what it takes to become an entrepreneur, the beneficiaries were subjected to two sets of personal assessments. The training also included a discussion on what kind of business is right for the beneficiaries. The topics also touched on the types of business, choosing business location, the different sources of capital and how to obtain it, and the process of registering a business.

### *Cooperative Formation*

The salt producers of Miagao signified their intention to transform their association into a cooperative. As a requirement for the registration of their cooperative, the members of the association must undergo a pre-membership education seminar for cooperatives. All concerned salt producers then participated in a comprehensive three-day seminar conducted by Mr. Federico Monsale, Jr., the Cooperative Development Officer of Miagao. The seminar discussed the definition of cooperative, how it is formed and who can become its members. It also covered the duties and rights of the cooperative member, the functions of its officers, the organizational structure of the cooperative, and the various services that the cooperative can offer, as well as its management and source of capitalization.

In the town of Oton, Mrs. Ma. Eden Borbon and Mrs. Maria Rosena Jaspe of the Municipal Agriculture Office conducted a seminar on cooperativism and basic business management. The resource persons described the nature and aims of cooperatives; the cooperative philosophy, principles and practices.

### *Accounting for Non-Accountants*

The beneficiaries from the towns of Anilao, Banate and Barotac Viejo, all from Banate Bay area, attended a training session on accounting for non-accountants. This was conducted for one day at the BBRMCI Training Center by Prof. Ma. Piedad A. Palacios and Prof. Mary Rose Rebueno, faculty members from the UPV College of Management. The training exposed the participants to the basics of accounting, the analysis of transactions and its proper recording. They also had a hands-on training on journalizing of accounts and proper accounting of income as well as the preparation of the basic financial statements. As part of the training, the basics of how to cost a product and how much should be its selling price was also taken up. With the financial statements they have prepared, the participants were made to undergo financial statement analysis by computing ratios for the different financial indicators like profitability, solvency and liquidity. The objective of the



financial statement analysis was to aid the beneficiaries in making sound management decisions based on the results of their operations as reflected in their financial statements.

### *Sales and Salesmanship*

Prof. Jose Neil Hortillo from the UPV College of Management conducted a seminar on sales and salesmanship for the beneficiaries from Anilao, Banate and Barotac Viejo. Prof. Hortillo described ways on how to conduct sales calls and close transactions. He talked on the selling concept as a part of a decision-making process, the different ways on how to reach the customers and some steps to successful selling. The talk also included topics on how to motivate the sales force, preparing the sales plan and the sales interview.

## **Training on Product Development**

### *Fish Balls Production*

The Anilao Fish Processors Association came up with the idea of producing fish balls during the training on How to Start a Business. The members considered it a product that is affordable and would ensure a quick return on investment. The association conducted a production and marketing run of fish balls during their town fiesta using their own formula for fish ball making. The group made a small profit from the three-day sale, however, the members admitted that they need to improve the quality of their fish balls. The FAO-supported Project then tapped the expertise of Mrs. Ernestina Peralta, a Researcher from the UPV Institute of Fish Processing Technology (IFPT). Mrs. Peralta recommended a new formula for the fish balls and introduced a variation of this product, which is the bola-bola. Mrs. Peralta also gave a lecture on product labelling which showed what must be placed in the label as mandated by the Nutrition Labelling Act. The members of the association then made a test production of the improved fish balls and fish bola-bola. The association also expanded their market to the cooperative store of the Anilao High School, which they now supply on a regular basis.

### *Shrimp Paste Production*

The fisherfolk from the towns of Tigbauan and Barotac Nuevo chose to improve their existing shrimp products through value addition and better packaging. For the shrimp paste micro-enterprise in Tigbauan, the Technical Consultants were Dr. Erlinda Panggat and Mrs. Mercy Quilantang – Professor and Researcher, respectively of UPV IFPT. Dr. Panggat conducted a half-day seminar on value adding, appropriate processing and packaging technologies for fermented fish products. The beneficiaries were briefed on the definition of fermentation, raw materials that can be used other than small shrimps, appropriate processing and packaging techniques, principles of value adding and other techniques in obtaining high quality fermented products. The beneficiaries also visited the IFPT laboratories to observe the facilities and actual set-up in shrimp paste making using the standard method used at IFPT. Dr. Panggat also gave a lecture on Good Manufacturing Practices and Standard Sanitary Operating Procedures for one half day at the Barangay Multipurpose Hall. She discussed health hazards associated with contamination of shrimp paste, sanitary practices for the workers outside and

inside the processing area. Hands-on demonstration for the processors was also given by the resource persons on the standard shrimp paste processing method, value adding like the spicy adobo shrimp paste, product packaging and labelling.

For the shrimp paste micro-enterprise in Barotac Nuevo, the Technical Consultant was Mrs. Ernestina Peralta, a Researcher of UPV – IFPT. Mrs. Peralta observed the procedure for shrimp paste processing by the beneficiaries and made recommendations to improve or come up with a better quality product. She also introduced an alternative process that would do away with grinding and drying which is their current practice. This alternative process would introduce ease in shrimp paste production during the rainy season when shrimp catch is high in the area. Mrs. Peralta also demonstrated the production of flavoured shrimp paste and gave a lecture on good manufacturing practices and personal hygiene for the processors.

#### *Fish Sauce Production*

The Sumakwelan Fisherfolk Association of San Joaquin decided to undertake fish sauce production because during the peak fishing season, the abundant fish catch results in a very low price for their fish. The production of fish sauce will give higher value to their fish catch and increase their income. The FAO-supported project provided the materials whereas the members of the association provided labour for the construction of a village- type processing facility. The Technical Consultant of the fish sauce micro-enterprise was Mrs. Rose Mueda, a Researcher of UPV – IFPT. Mrs. Mueda conducted training and hands-on demonstrations on the processing of fish sauce with emphasis on the hygienic process to produce a clean and safe product. The first training, which lasted for one half-day, was on a laboratory scale using 5 kg of fish. The second training, conducted for one whole day, was on a pilot scale using 50 kg of fish which were fermented in the concrete tank of the fish processing facility. Additional training was also conducted on Record Keeping, Cost and Pricing Strategy, and Packaging and Labelling to improve the operation and increase the profitability of the fish sauce micro-enterprise.

#### *Salt Iodization*

Salt making is one of the livelihood projects supported by the municipal government of Miagao. Aside from providing additional income for the fishers, the municipal government wants to preserve their traditional salt making method for tourism purposes. During the consultation with the Miagao Salt Producers Association, the members expressed the need for training on the iodization of the salt they produce. Salt iodization is a requirement of Republic Act No.8172 which mandates that all table salt sold in the market must be iodized and all establishments in the manufacture and preparation of food must use iodized salt. In the salt iodization micro-enterprise, the Technical Consultant was Dr. Aklani Rose Hidalgo, Associate Professor of UPV – IFPT. Dr. Hidalgo gave a lecture on “Iodized Salt: Its Importance and Proper Handling” to the salt producers and other members of the community. A lecture-demonstration on salt iodization was given by Dr. Hidalgo with the FAO-supported project providing the basic materials for this activity. This was followed by a hands-on training on salt iodization for all members of the

association. Each salt producer was able to iodize 10 kg of salt which was packed and labelled in ¼, ½ and 1 kg plastic bags. Dr. Hidalgo also gave recommendations on improving the quality of their salt, packaging and marketing of their iodized salt.

### *Mussel and Oyster Culture*

The San Francisco Fisherfolk Association of Barotac Viejo signified their intention to culture mussels and oysters because the shellfish sold in their town are coming from the nearby province of Capiz. The fisherfolk of San Francisco observed spat of oysters and mussels clinging onto various substrates in their coastal area and believed shellfish culture could be a profitable micro-enterprise. Dr. Carlos Baylon, a Professor of UPV Institute of Aquaculture and Technical Consultant of the micro-enterprise, gave a lecture on the different methods of culturing mussels and oysters. The raft culture method was preferred by the association because of its high yield and this would not contribute to the shallowing of the culture site due to increased siltation. Dr. Baylon also gave a lecture on the raft culture method and the procedure for its construction. The FAO-supported project provided materials whereas the members of the association provided labour for the construction of the first culture raft. Dr. Uwe Tietze, during his visit to the culture site, recommended to the members of the association to focus on culturing individual oysters since these would command a high price in the market. With assistance from the FAO-supported project, two additional culture rafts were constructed owing to the high potential of the micro-enterprise as observed in the high attachment rate of oysters and mussels in the first raft.

### **Assessment of the Training Sessions**

An assessment was made after the conduct of the training sessions to determine the relevance of the topics discussed and the ability of the resource persons to impart knowledge and skills to the beneficiaries. The assessment was made by Mr. Arcsel Gerard Sagge, Research Assistant of the FAO-supported project, through interviews of selected participants of the training sessions and workshops. The interviewed participants mentioned that the resource persons were very patient in explaining the topics and were able to answer satisfactorily the questions asked by the trainees. The participants also said that they were able to understand the subject matter because of the lecture-demonstrations and the hands-on training given to them. The following activities implemented by the beneficiaries are proof that the training sessions were effective and put to good use:

- the Miagao Salt Producers Association were able to complete their registration with the Cooperatives Development Authority;
- members of the San Francisco Small Fishermen Association have started harvesting their mussels and oysters;
- shrimp paste producers of Barotac Nuevo and Tigbauan are now employing the hygienic preparation of their basic ingredients as recommended by the resource persons and have done a production run of their flavoured shrimp paste;
- fish vendors of Banate and Oton have fully paid their loans; and

- Anilao fish processors are now producing fish balls and fish bola-bola on a regular basis and now saving capital to buy a heavy duty blender to expand production.

## STEPS NEEDED TO BECOME A FULL-FLEDGED MICRO-ENTERPRISE

The initial step for becoming a full-fledged micro-enterprise is compliance with all the registration and certification requirements of the government. The different micro-enterprises in Banate Bay and Southern Iloilo must comply with the following requirements to have a legitimate business existence and to have an operational organization:

Activity	Ano	Bte	BNo	BVj	Gum	Mgo	Otn	SJn	Tig
Registration of business name with DTI. (P300)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Registration to legitimize existence as a cooperative with CDA. (P1,000)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Securing of tax identification number and registration of the books of accounts as well as printing of business documents like official receipts with BIR. (P600)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Securing local clearances and business permits. (P1,000)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Registration as an employer with the government's social security program, SSS.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Securing membership in the government health care benefits system with PHIC.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Registration with DOLE for the monitoring of compliance with labour laws.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Registration with BFAD as a licensed food manufacturer. (P500)	✓	NA	✓	NA	NA	✓	NA	✓	✓

Application with GS1 for use of bar codes. (P1,300)	✓	NA	✓	NA	NA	✓	NA	✓	✓
Secure electric service connection. (P5,000)	OP	OP	OP	OP	OP	OP	OP	OP	OP
Secure water services connection. (P3,360)	OP	NA	NA	NA	NA	NA	NA	NA	NA
Secure communication facilities connection. (P5,000)	OP	OP	OP	OP	OP	OP	OP	OP	OP

Legend: Ano - Anilao; Bte - Banate; BNo - Barotac Nuevo; BVj - Barotac Viejo; Gum - Guimbal; Mgo - Miag-ao; Otn - Oton; SJn - San Joaquin; Tig – Tigbauan; OP – optional.; NA – not applicable.

A minimum of Php 2,900.00 is needed for basic business registration of micro-enterprises. For a food processor or manufacturer, an additional expense of Php500 is needed for registration with BFAD. Another Php 1,300 will be needed for application to use bar codes with GS1 and an additional Php100 for each product to be registered for bar coding. Bar coding is required for items that will be retailed in big grocery stores such as SM Supermarket, Gaisano Supermaket and Iloilo Supermart. To avail of utility services, the micro-enterprise has to advance Php 13,360 for water, electricity and communication. Electrical connection maybe prioritized over water and communication because water supply is abundant and communication can be facilitated by personal mobile phone units.

In addition to complying with the above requirements, a lot of work must be done particularly in production, marketing and human resource support or management of these micro-enterprises to be viable and sustainable. The beneficiaries should find ways to improve the quality of their products and the production processes to minimize costs and eventually maximize profits. Further, enough quantities of their products should be generated to meet market demands created by their marketing efforts. On marketing, efforts must be exerted to identify potential markets and develop strategies on how to reach them. Prices should be reviewed to be more competitive and promotional tools should be considered like advertising and sales promotions. With regard to management and operation of the micro-enterprise, there should be a suitable organizational structure with appropriate management policies and operational guidelines. The organizational structure must show the lines of authority and staffing pattern while the operational guidelines should contain a suitable internal control system.

Becoming a full-fledged micro-enterprise requires hard work over a period of time – at least five years. There is also the equivalent monetary resource that should be considered. The members of the fisherfolk association should have the fortitude and firmness to make their micro-enterprise viable and sustainable. On the other hand, the other stakeholders like funding agencies, the academe and other government agencies should continue offering the

necessary support for the growing micro-enterprise in the form of additional grants and appropriate extension services.

## ADDITIONAL TRAINING NEEDS

The beneficiaries of the FAO-supported project have attested that the training sessions they have undergone were very important in starting their micro-enterprises. However, not all members of the fisherfolk associations were able to avail of the training programs that were conducted owing to funding and time constraints. The beneficiaries will have to be trained on the following specific areas for the long-term profitability and sustainability of their micro-enterprises:

### **Management Skills Development and Enhancement**

The most critical skill that should be learned by the micro-enterprise beneficiaries is the ability to manage their operations. The beneficiaries should be trained further in planning, organizing, implementing and controlling the various micro-enterprise activities. The management should be able to strategize their operations, out source and utilize resources, execute strategies and direct actions. As all of these require a lot of interaction, the management should also be adept in both intra and inter-personal skills.

### **Values Re-orientation**

The beneficiaries also need to undergo a values re-orientation seminar. Most micro-enterprises fail because their capital is sometimes used for personal purposes. They should be made aware that, for their micro-enterprise to succeed, enterprise transactions should be separate from personal transactions and the capitalization provided for the enterprise should be used primarily for its operations. Only a portion of the income derived from operations can be for personal use and the beneficiaries should be prompted to keep their priorities straight.

### **Marketing Skills on Sales, Packaging and Product Promotion**

The beneficiaries would also have to build on their marketing skills. In Anilao, for example, the beneficiaries stated that they lack the skill of selling. They mentioned that they need help in improving their self-confidence to be able to push their products to customers and to create distribution linkages. This is also true for the other micro-enterprises.

Further, they should also be immersed in the proper packaging of their products as well as learn strategies in effective promotion and distribution. For them to be able to deliver their products in other geographical locations, they should also acquire knowledge on logistics operations.

### **Good Manufacturing Practices, Hygiene and Food Safety**

The production aspect of the micro-enterprise has to be improved. The beneficiaries have to learn about the different factors that contribute towards the making of top quality products. For the producers, they must employ good personal hygiene practices and must maintain cleanliness of their utensils and working areas to ensure good quality and safety of their products.

Good sanitation inside and outside the processing plants must also be observed by the food producers and manufacturers.

In the case of Anilao, they still have to improve on the taste of their products. Shelf life of their fish bola-bola has to be established and they have to find ways to lower the cost while maintaining the quality of their products. For the micro-enterprises of Barotac Nuevo and Tigbauan, the producers should be exposed to good manufacturing practices. Hygienic preparation of shrimps has to be observed to achieve quality produce. Innovation on the current shrimp paste has to be introduced for it to be differentiated from shrimp paste products of other companies already introduced in the market.

Barotac Viejo has to acquire technology on raising oysters to produce bigger-sized individual oysters and ensure a good harvest. The producers have to ascertain that the water where the oysters grow is of good quality and is maintained that way all year round. All of these should be done to guarantee that they would be able to produce the best oysters and get a good price for their produce. In Miagao, the beneficiaries have to find ways to purify the seawater that serves as raw material in making salt. The drying facilities and methods should also be evaluated for sanitary considerations. This is to achieve a certain quality that would make the Miagao salt the preferred salt in the market.

### **Financial Management Skills**

Financial information is very crucial in making sound decisions. Most of the beneficiaries were not exposed to recording their financial transactions and keeping their books of accounts, they should then be given training on basic accounting and bookkeeping. In addition to the preparation of financial reports, they should also be guided on how to use these reports in making sound decisions through a seminar on proper financial and credit management.

To further inspire them to proceed with their micro-enterprises, an educational tour to some successful micro-enterprises may be arranged. Through this, the beneficiaries can have first-hand information on a similar endeavour that is progressing – enabling them to validate the learning they acquired from the various seminars conducted. Once exposed to an actual enterprise scenario, their resolve to commit themselves to the micro-enterprise endeavour will be intensified.

## **LESSONS FROM THE FAO-SUPPORTED PROJECT**

After a year of implementing the project, important lessons were learned which can be used as a guide for similar and future endeavours. These are:

1. Stakeholder participation is essential to the sustainability of micro-enterprises. When the FAO-supported project was started, a primary consideration was how to sustain the micro-enterprises after the end of the project where funds will no longer be available. An important factor in sustainability is the active participation of officials of the LGUs and CRMCs in

the planning and implementation of the micro-enterprises. Officials from these municipalities recommended the fisherfolk organization with a good track record that should be involved in the micro-enterprise project. In this way, the micro-enterprise that will be established will have a greater chance of success. For the beneficiaries, they had a direct say on what micro-enterprises they want to establish and what training programs and other support that should be extended to them. Through the active participation of the stakeholders, a sense of ownership is developed and these stakeholders will continue to be involved and will support their micro-enterprise even if external funding has ended.

2. To transform a fisher into an entrepreneur is a long process which may not be achieved within a one-year project duration. There should be values orientation for the beneficiaries for them to develop a certain entrepreneurial character. The beneficiaries should be able to adopt the proper attitude and must have a firm commitment for their micro-enterprise to become successful.

3. Different strategies may have to be utilized for the different micro-enterprises to attain early success. There is an advantage in implementing the livelihood project through the fishers' association because this fosters cooperation among community members. However, in one micro-enterprise in Banate Bay, some members of the association were not fully committed, thus slowing down the progress of the micro-enterprise. In a case like this, it may be a good strategy to just fully support a few hardworking and enterprising members, and when the micro-enterprise becomes profitable, they could just hire the other members of the association.

4. Capacity building is vital to the success of micro-enterprises. Through the various training sessions conducted, the beneficiaries were able to make the operation of their organization more efficient which led to the improvement of the production, packaging, and marketing of their products.

## RECOMMENDATIONS

The development of micro-enterprises is an important strategy to augment the income of small fishers, alleviate poverty and at the same time reduce fishing pressure in the coastal area. For a micro-enterprise to become sustainable will require a long process and will need the implementation of the following recommendations:

1. The LGUs and CRMCs must continue to support and monitor the progress of the micro-enterprises that were established. The concerned municipal official e.g. fishery officer should follow-up the status and encourage the beneficiaries to continue working for their enterprise until it becomes fully viable.

2. There should be active collaboration among the municipalities, the academe and other government institutions to respond to the needs and provide solutions to problems encountered by beneficiaries operating the micro-enterprises.



3. Financing institutions should provide special access to loans and capital for micro-enterprises established by fisherfolk associations. The long process and many requirements of the financing institutions have discouraged the fisherfolk from availing of these loans to start their micro-enterprises.

4. There should be a basic set of training program suitable for micro-enterprise development, consisting of, but not limited to the following: values orientation; organizational strengthening; product development and marketing. The members of a fisherfolk association must undergo this training program before starting the micro-enterprise in order to ensure its success.

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Conference Paper 18

# Paralegal Work: A Community-Based Approach to Fisheries Law Enforcement in Negros Occidental, Philippines<sup>1</sup>

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## ABSTRACT

The depletion and degradation of the State marine and aquatic resources due to uncontrolled exploitation are the primary reasons for the enactment of fisheries laws. There are two approaches to the enforcement of these laws. Traditional law enforcement involves the intervention or actual performance by government through its designated and deputized agents. However, government activities are directed mainly at preventing further resource depletion. This is a shortcoming that prompted the conduct of alternative law enforcement strategies aimed at resource development.

Paralegalism is a concept that pursues developmental legal aid, which is provided for the poor and marginalized sectors of society, such as a fishing community. This aid is provided by paralegals who are non-lawyers but with sufficient understanding of the law after having undertaken paralegal training. In coordination with the local government unit, non-governmental organizations conduct paralegal activities in the community. The residents undergo paralegal training, which includes education on the substantive and procedural aspects of the fisheries laws. The empowerment of community residents prompts them to initiate or participate in the apprehension and litigation of fisheries law offenders. The community involvement manifests the social acceptability of paralegal work. On the other hand, financial and/or logistical support is provided by the local government unit. This expresses its political acceptability to paralegal work in the community. The acceptability of both the community and the local government unit are indicators for determining effectiveness of paralegal work as a community based approach to fisheries law enforcement.

## INTRODUCTION

There is important national legislation designed to protect the marine environment, develop the fisheries resources, and manage resource users' conflicts. However, the enforcement of these laws is slow and inadequate. Illegal fishing and habitat destruction continuously proliferate with the existence, or lack of, enforcement plans and programs of Local Government Units (LGU). This condition prompted the pursuit of non-governmental undertakings that empower residents in coastal communities to participate in the enforcement of fisheries laws. One of these undertakings is pursued by Non-Governmental Organizations (NGO) in which paralegals initiate and develop the capacities of local fishing communities in fisheries law enforcement. The success of the community law enforcement effort depends upon the nature of paralegal work, which is determined in terms of NGO capability, the levels of community acceptability and participation, and the degree or extent of local government support.

Except for some success stories narrated by NGOs engaged in paralegal work, there is limited research and literature on the subject matter. Available information generally describes the qualifications of paralegals and the nature of their work,

which are mainly providing assistance to lawyers and individuals needing legal assistance. Thus, there is the need to look into the nature of paralegal work as an independent and empowering initiative and how paralegal activities are geared towards achieving the goal of increasing community participation in fisheries law enforcement.

## FISHERIES LAW ENFORCEMENT: BASIS, ISSUES AND PROBLEMS

The Philippines is an archipelago comprised of more than 7,100 interrelated islands that are interconnected by bodies of water and forming one single geographical, economic and political entity.<sup>2</sup> The bodies of water that form part of the national internal waters and territorial sea are rich with marine and aquatic resources. These resources are vital in at least three ways: as food to a population that depends on fish and fish products as a major sources of protein,<sup>3</sup> as alternatives to expensive common animal meat sources (cow, chicken), and as significant sources of income needed to buy other needs.

### **The Need for Fisheries Law Enforcement**

The abundance of marine and aquatic resources surrounding the Philippine archipelago during the 1930s is the primary reason for the government to pursue a framework of development that is based not on availability but on access to the resource employing certain technologies.<sup>4</sup> However, this kind of development resulted in depletion of fish stocks and destruction of marine habitats. In response to this resource condition, legislation has been enacted to promote resource protection along with resource exploitation. Unfortunately, this response is inadequate as resource exploitation continues to be uncontrolled.<sup>5</sup>

In 1998, Republic Act 8550 or the Philippine Fisheries Code is enacted to address the continuing critical problems of resource depletion and degradation. Chapter VI of the Code provides for certain prohibitions (and corresponding penalties) in fishery<sup>6</sup> practices and the use of fishery technologies that have adverse effects on fish and aquatic resources.<sup>7</sup> These prohibitions apply to both Municipal and Commercial fishers who are engaged in fishing activities.<sup>8</sup>

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<sup>2</sup> 1982 United Nations Law of the Sea Convention, Part V, Article 46.

<sup>3</sup> IBON Databank and Research Center, *The Philippine Fisheries* (Manila: IBON Foundation, Inc., 1997) p. 11. 60% of national protein consumption is from fish.

<sup>4</sup> Asuncion Siam and Alan T. White, "Evolution and continuing challenges of coastal management in the Philippines," *Over Seas* 7, no. 7 (July 2005) <<http://www.oceocean.org/overseas/200507/evolution.html>> 15 February 2005.

<sup>5</sup> Ibid.

<sup>6</sup> By fisheries, the Code includes those activities that relate to the act or business of fishing, culturing, preserving, processing, marketing, developing, conserving and managing aquatic resources and the fishery areas (such as bays, gulfs, and lakes).

<sup>7</sup> The Code defines aquatic resources as including fish and all living resources in the aquatic environment such as salt and corals. Fish and/or fishery products under the Code include finfish, mollusks, crustaceans, echinoderms, and other marine mammals.

<sup>8</sup> Municipal fishers are those engaged in fishing within the Municipal waters. The Fisheries Code prohibits commercial fishing within the 15-kilometer Municipal waters, unless the municipal government permits them

The Fisheries Code devolves a broad range of powers and responsibilities to the local government unit, specifically the municipality and city, in order to empower them to directly manage the fisheries resources within their jurisdiction.<sup>9</sup> Section 16 grants the Municipality (and City) with authority and jurisdiction over fishery resources within their maritime boundaries or Municipal waters. In pursuit of this devolution, the Code requires every LGU to enact appropriate ordinances that are consistent with the fisheries law. Two types of ordinances are required to be enacted under the Implementing Rules and Regulations of the Fisheries Code. One, the Basic Municipal Fisheries Ordinance (Rule 16.1) delineates the boundaries of municipal waters and provides for rules and regulations on licensing and permits and other fisheries activities. Two, the Special Municipal Fisheries Ordinance (Rule 16.3) declares special demarcated fisheries areas, closed season and environmentally critical areas and sanctuaries. A Unified Fisheries may be enacted by LGUs that border bays, lakes and gulfs for an integrated management of the marine areas.

Moreover, the Fisheries Code does not only recognize and enhance the inherent legislative power of local governments but also directs the latter to exercise its executive power. In the exercise of this executive power, the LGUs are obligated to enforce not only the ordinances it enacted but also the entire Fisheries Code and other fishery rules and regulations.

### **Models, Approaches and Obstacles to Law Enforcement**

Generally, law enforcement refers to the involvement of individual entities in providing for measures that will accomplish the objectives of the law. In the Philippines, there are two models of law enforcement, which are herein referred to as the “traditional” and “alternative.”

The “traditional” model is context-specific as law enforcement is identified to include solely the interventions by government that are aimed at achieving compliance with the requirements of the law.<sup>10</sup> These interventions follow a “continuum of activities ranging from ‘soft’ preventive measures such as public education to ‘hard’ sanctions imposed by apprehension, prosecution, and conviction.”<sup>11</sup> “Soft” law enforcement essentially is intervention that utilizes non-judicial measures in order to promote voluntary compliance. Such compliance includes restraints from illegal activities due to the continued presence of enforcement authorities (e.g., police) and acceptance of

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within the 10.1 to 15 kilometer area (Article I, Section 18). Further, the Code defines fishing as those activities that involve the taking of fishery species from their wild state or habitat, with or without the use of fishing vessels.

<sup>9</sup> This is a reinforcement of the role of the local governments that is first stipulated in the 1991 Local Government Code, which implements the Constitutional provision on decentralization and democratization of governmental powers.

<sup>10</sup> Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources of the Department of Agriculture, and Department of Interior and Local Government, *Philippine Coastal Management Guidebook No. 8: Coastal Law Enforcement* (Cebu City, Philippines: Coastal Resource Management Project of the Department of Environment and Natural Resources, 2001) p. 22.

<sup>11</sup> *Ibid.*

the law due to adequate knowledge and proper attitude. On the other hand, “hard” law enforcement utilizes legal sanctions in order to impose involuntary compliance. Fines and/or imprisonment are penalties imposed in order to achieve some level of deterrence.

There are two approaches in the “traditional” model. One approach involves the government directly performing law enforcement. This includes the law enforcement agents (government authorized public employees) actually conducting arrests and seizures, public attorneys prosecuting, or government employees conducting public lectures. Another approach is when government initiates the conduct of an activity through a commissioned private entity (individual consultants, business group, NGO, or people’s organization). In this model, the government is a distinct actor with distinct goal and value system, that is, as the regulator. A vertical hierarchy of power exists with the government at the helm.

The weakness of the “traditional” model is its perennial shortcomings that mainly address the issue of resource depletion: the ambiguity and lack of clarity in policy objectives, the participation of too many actors and overlapping authorities, the lack of motivation from enforcers, and the inefficiencies of the judicial system. These can be further understood in terms of specific obstacles as follows<sup>12</sup>:

- Conflicting policies and laws and implementation programs
- Lack of political will to implement laws and enforcement programs
- Padrino or incentive system that promotes illegal activities
- Lack of patrol boats and other basic equipment to conduct monitoring and patrols
- Lack of trained law enforcement units
- Weak coordination between and among law enforcement agencies
- Lack of clear “lead” agency in coastal law enforcement
- Slow justice system with judiciary and prosecutors unfamiliar with fisheries and other laws
- Lack of public awareness of laws and consequences of illegal activities
- Slow economic development in coastal areas and lack of livelihood alternatives for fishers and those dependent directly on coastal resources

The advent of new information technology providing easy access to more liberal ideas and the adoption of measures that decentralize government powers to local governments are the significant sources of the “alternative” model. In this, the concept of enforcement is understood to be non-static, context-free,<sup>13</sup> and takes into account changing social patterns and development. This model is geared more towards the establishment of social equity (the empowerment of stakeholders to participate in the entire law enforcement continuum) rather than mere resource

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<sup>12</sup> Ibid., p. 20.

<sup>13</sup> Christoph Demmke, “Towards Effective Environmental Regulation: Innovative Approaches in Implementing and Enforcing European Environmental Law and Policy,” Jean Monnet Working Paper 5/01 of the Jean Monnet Program, Harvard Law School, Cambridge, MA., 2001 <<http://www.jeanmonnetprogram.org/apapers/01/010501-02.html>> August 04, 2004.

depletion. It is more adaptive to the transformations in society brought about by increasing public awareness to the dangers of environmental degradation and to the support for environmental protection.

Just like the traditional model, the alternative model also employs “soft” and “hard” preventive measures. However, the latter model broadens law enforcement as other actors, apart from government, are taking significant participative roles. Government no longer remains the regulator as the private sector shares with the former the same goals and value systems.<sup>14</sup> Thus, no hierarchy of power exists as both the regulator and regulatee aid each other in achieving compliance to the requirements of the law.

The alternative model is approached in two ways. One is when the private sector (essentially the civil society organizations or CSO, though sometimes the business entity) initiates an activity and the government merely performing coordinating functions. The government role is necessary to acquire legitimacy and authority for the activity. Another approach is when the private sector solely conducts law enforcement (such as the academe pursuing “soft” law enforcement or individuals performing citizen’s arrest).

### **Community-Based Approach to Fisheries Law Enforcement**

The local government political structure in the Philippines is subdivided into the province, municipality/city, and barangay. The community in this study is confined mainly to the barangay, which is the basic political subdivision. Consequently, the coastal community is confined mainly to the barangay situated in the coastal area.<sup>15</sup>

The coastal community is an essential element that can contribute significantly to effective enforcement of the fisheries laws. This is because the marine resource users mainly come from the coastal areas which offer opportunities to them in terms of food and livelihood. Coastal environmental degradation adversely affects the access of the users to the marine resource. Thus, as the direct beneficiaries of the marine resources, community participation in efforts towards resource protection and preservation is vital.

The community is incapable by itself to initiate the enforcement due to a number of factors. First, it lacks the organization necessary to mobilize and pursue concerted efforts. The absence of organization, coupled with the inefficiencies of law enforcement agents, prompt the proliferation of illegal activities committed by residents as well as outsiders. The second factor is the prevailing ignorance or lack of understanding of the law among the residents due to economic and social priorities. Since knowledge of the law is not determined in terms of financial or economic returns, as such it does not directly put food on the table, so is considered as a lesser priority. This priority manifests the prevailing poverty conditions in the

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<sup>14</sup> Ibid.

<sup>15</sup> The Fisheries Code defines the geographic extent of the coastal area as the landmark limit of one (1) kilometer from the shoreline at high tide, and seaward limit of 200 meters isobath.



coastal areas<sup>16</sup> and the culture that inhibits motivation to engage in political undertakings. Finally, the absence of organization and motivation preclude opportunities for the development of skills and resources. Without the social infrastructure that will arrange priorities and directions, the community does not possess the collective initiative to participate in fisheries protection.

Given the above conditions, the representatives of government and NGOs bring to the community tools and methods that will involve the latter in the fisheries law enforcement. This is the community-based approach, which is intended primarily to address the inadequacies of the coastal community and thereby empowering individual stakeholder therein to participate, collectively or individually, in law enforcement and realize the objective of resource and environmental preservation.

## PARALEGALISM, PARALEGAL WORK AND COMMUNITY-BASED LAW ENFORCEMENT

Lawyers provide legal services to private clients for an equivalent fee. However, when the clients are the poor and marginalized sectors of society, lawyers provide legal aid, where monetary payments are a secondary consideration. There are two types of legal aid in the Philippines: traditional legal aid and developmental legal aid. Traditional legal aid focuses on the protection of the rights of the poor through the law. It works on the assumption that injustice is the result of human “greed and weaknesses”<sup>17</sup> and their ignorance of the law rather than the weaknesses inherent in the law. Thus, injustice can be redressed through the litigation process whereby the rights of the poor can be protected against the forces that undermine them. These forces include the political and economic elites who either use the state to advance their private interests or who profit from the inaction and inefficiency of the state. Public interest lawyering is an example of traditional legal aid.<sup>18</sup>

The second type of legal aid is not a distinction of the first but a complement since litigation is also a necessary means to provide for social justice. However, developmental legal aid goes beyond the provision of legal assistance in court. It further aims to change the social and legal systems that deprive the poor of their right to decide for themselves. Alternative lawyering is a particular legal practice that provides for developmental legal aid. In this practice, the law is treated not just a given but a critical tool to promote the democratic and just distribution of power, wealth and other related values. This can be done by resolving social issues, changing society through the law or changing the unjust law itself, and changing people and communities.<sup>19</sup> Alternative lawyering involves the community being served not only in law reform but in law enforcement as well. The empowerment of

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<sup>16</sup> IBON Databank and Research Center, *supra* note 2., p. 23.

<sup>17</sup> Jose W. Diokno, “Developmental Legal Aid in Rural ASEAN: Problems and Prospects,” working paper, International Commission of Jurists, Penang, Malaysia, 1981.

<sup>18</sup> Marlon J. Manuel, “Lawyering with the poor,” *From the Grassroots: The Justice Reform Agenda of the Poor and Marginalized* (n.p., n.d.).

<sup>19</sup> *Ibid.*

the people in the community is an essential objective that will lead to the goal of development.

### **Paralegals and Paralegalism**

Generally, it is the lawyer who performs legal aid. When the lawyer is not available, certain legal work not acknowledged as part of the practice of law is done by either the legal assistants or paralegals. But unlike legal assistants who simply perform clerical service for the lawyer, a paralegal is a person who:

- is not a lawyer and, therefore, not accredited to practice law;
- possesses basic knowledge of the law and the legal and conflict resolution procedures;
- is either a resident of the community or works with an organization; and,
- is committed to do developmental legal aid.

Paralegals work in any of the areas of law, such as criminal law, labour law, patent and copy right, real estate, etc. They work in either private (corporations, law firms, NGOs) or public organizations.

From the NGO concept,<sup>20</sup> a paralegal has finished paralegal training (PLT) that provides the basic knowledge and experience for paralegal work. Paralegal training is distinguished from training about the law.<sup>21</sup> The latter is only limited to the specific provisions of the law or the law itself. On the other hand, PLT follows a module that includes components on substantive aspects (the content and interpretation of the law), on procedural aspects (search and seizure, evidence, affidavit making, process of prosecution), and on paralegalism.

Paralegalism is a concept in pursuit of developmental legal aid.<sup>22</sup> Specifically, paralegals participate in alternative lawyering by performing specific duties, which include organizing and mobilization of people, establishing people and lawyer partnerships, providing support for legal assistance, and advocating for social change and law reform. These activities are based on realities that promote social and economic inequities, uphold unjust laws, and prevent the marginalized sectors from access to social justice. Paralegalism is strengthened by its exclusivity in achieving developmental objectives. This is because paralegals cannot engage in the practice of law and the provision of legal assistance that are the exclusive work of lawyers. This inability directs paralegals to engage predominantly in developmental legal aid, and engage, partially, in purely traditional legal aid. Moreover, while the lack of time and opportunities for financial or monetary returns make lawyers least attracted to engage in alternative lawyering, paralegals are exception from these attractions. Instead, the latter are directed to be more focused on developmental work.

While paralegals pursue developmental legal aid, they are engaged in either traditional or alternative law enforcement. Thus, public servants are also engaged in

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<sup>20</sup> Atty. Cecile Sabig, interview by the author, 05 November 2004.

<sup>21</sup> Ibid.

<sup>22</sup> Sentro ng Alternatibong Lingap Panlegal (SALIGAN), "Philosophy of Paralegalism," *Manual for Paralegals: Violence Against Women*, 1999, p. 17-20.

paralegal work. It is when the government is inadequate to pursue the work (due invariably to the inherent weakness of traditional law enforcement) that CSOs, NGOs and private individuals pursuing advocacy work acquires prominent roles in pursuing alternative law enforcement.

### **Community-Based Paralegal Work**

One of the activities of alternative lawyers is the provision and enhancement of legal literacy at the grassroots level. The purpose is to develop the legal capacity of identified stakeholders (such as farmers, fisherfolk, women, youth) so they can freely express their rights and fully participate in community development. These lawyers usually are engaged in the conduct of the activities of NGOs to which they belong or they, as individuals, participate in NGO activities.

When the lawyers are not available, legal work is delegated to the paralegals. The legal services provided are usually free and involve a wide range of work including the giving of basic legal advice, community education, and referral service (which may include conduct of research and investigation, referral to a lawyer, and assistance in the disposition of cases).

Paralegal work is community based because of the conduct of paralegal activities in the barangay, the participation of barangay residents (more particularly those who have stakes in the utilization and management of the marine environment), and with the activities geared primarily at empowering these residents so they can fully participate in the effective enforcement of fisheries laws. It is vital that the residents are educated about the law and its ramifications so they can perform their obligations and enjoy their rights. Furthermore, an empowered community can provide government with practical inputs for decision-making and facility for the implementation of plans and programs.

## **PARALEGAL WORK IN NEGROS OCCIDENTAL, PHILIPPINES**

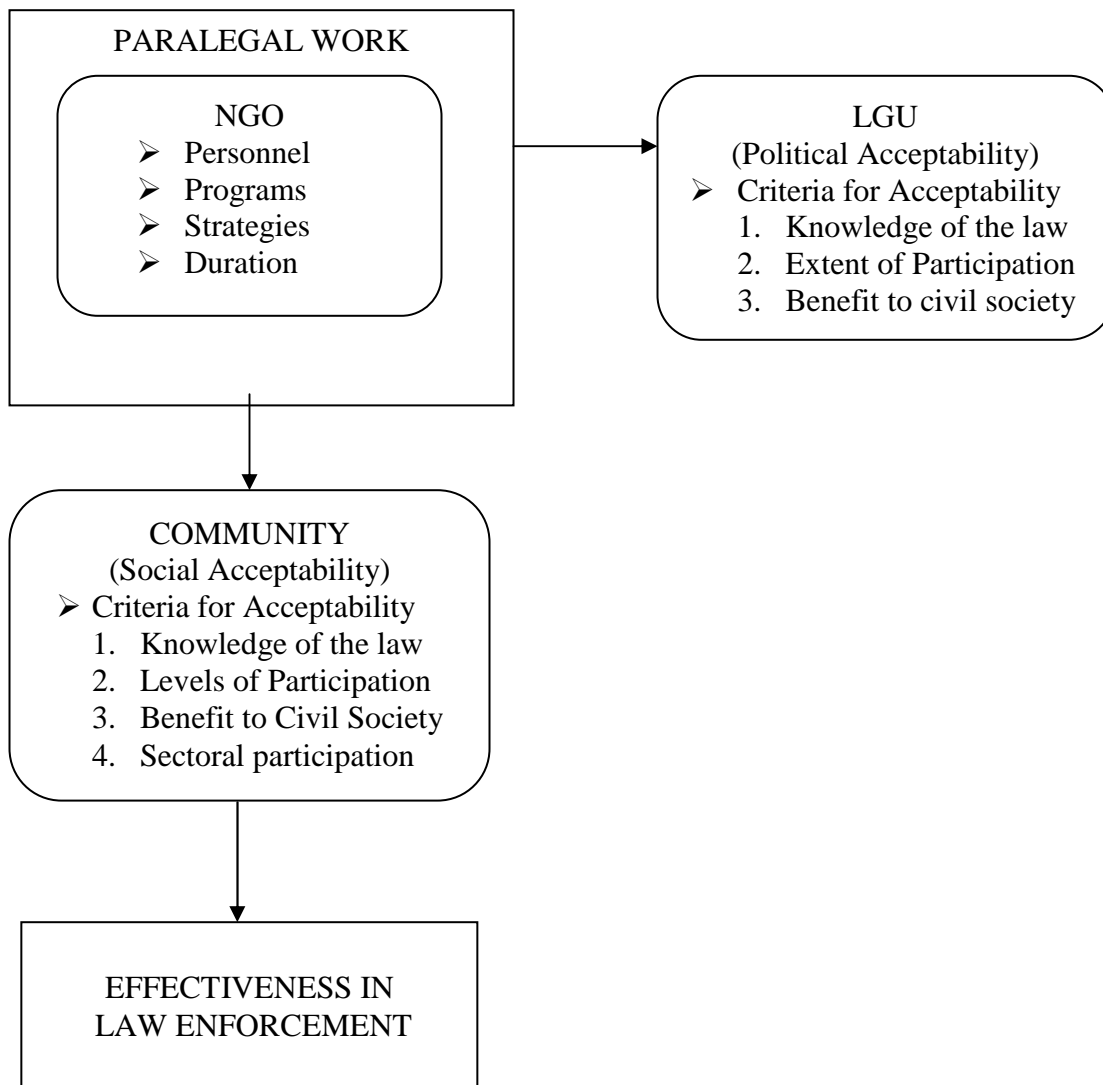
The following discussion is the result of a study that seeks to describe the paralegal work conducted by NGOs in the coastal community, the community response, and the contributions of the undertaking to effective enforcement of fisheries laws. NGOs in this study are engaged in either traditional or alternative law enforcement in the pursuit of paralegal activities.

### **Framework of Analysis**

Figure 1 below presents the framework of analysis. NGOs conduct paralegal work in a particular community or barangay in a city or municipality. The conduct of paralegal work is done in two approaches. One is when the NGO directly involve themselves in the community and mobilize the people to organize and act on identified issues. The second approach is when the NGO cooperates with the local government by way of either facilitating or actually implementing the latter's program and project. Paralegals are either regular employees of the NGO or are contracted to conduct the

facilitation or implementation of the LGU program and project. In the implementation of these programs, certain strategies are employed. Lastly, the duration of paralegal work contributes to the over all content of the NGO undertaking.

Figure 1. Schematic Diagram of Framework of Analysis



Paralegal work conducted by NGOs generates positive or negative reactions from the local government unit, particularly from the local executive officials (of the city, municipality, or barangay), the police force, and the deputized fish wardens (or Bantay Dagat). Regardless of which entity initiates a paralegal activity, the reaction is both on the manner by which the NGO facilitates and implements an LGU program and project and the conduct of the program and project of the concerned NGO. The reaction, classified as political acceptability, is determined in terms of certain criteria for acceptability: the knowledge about fisheries laws, the extent of participation in the paralegal activities, and the identified benefit to the civil society.

On the other hand, the beneficiaries of paralegal work, the community, may either accept or reject the undertaking. The social acceptability of the NGO paralegal work by the relevant civil society sectors (fisherfolk, women, and youth) in the community is determined in terms of certain criteria for acceptability: their knowledge of fisheries laws, the levels of participation in the paralegal activities, the identified benefits to the civil society, and the number of sectors participating.

Social acceptability determines the effectiveness of paralegal work in the community in the enforcement of fisheries law. However, effectiveness is not cited as a conclusion. Rather, it describes the prospects. This means that the level of community participation will contribute to the success of the endeavor to enforce the fisheries laws.

### **Participants**

The participants in this research include local government units in the selected cities and municipalities in the Province of Negros Occidental, NGOs that are conducting paralegal work in the Province, and civil society sectoral organizations (fisherfolk, women, and youth) in identified coastal barangays of the concerned LGUs where paralegal work is done.

Negros Occidental is one of the two provinces in Negros Island located in central Philippines. It has thirteen (13) cities, twelve (12) of which are coastal. It also has nineteen (19) municipalities and thirteen (13) of which are coastal. Two coastal cities (Victorias and Talisay) and two (2) coastal municipalities (Hinigaran and Cauayan) are randomly selected to comprise the local government institutions. The selection is done after identifying those cities and municipalities where NGOs do paralegal work. The cities and municipalities are distinguished from each other for the purpose of describing the paralegal work therein.

Political acceptability is determined from the responses from interviews with concerned local government officials who serve as key informants. These include the City/Municipal Agriculturist, the Barangay Captain (village head), the officer-in-charge on maritime affairs in the Philippine National Police (PNP) of the LGU, and representatives from the deputized fish warden (Bantay Dagat) of the LGU.

On the other hand, one coastal barangay from each of the local government institutions is purposely selected as study area for determining social acceptability. The basis for the barangay selection is the concentration of paralegal work done by the NGO. The respondents from the barangays include ten (10) active members, randomly selected from a list, from each of the sectoral organizations abovementioned. An active member is one who regularly attends meetings and participates in the group activities. The sectors, classified into organizations, are distinguished as follows in order to avoid duplication in respondent selection:

- Fisherfolks are males engaged in the actual extraction of fish and fisheries resources on sea and who are eighteen (18) years old or older;

- Women are females who are eighteen years old or older and who are engaged in any other occupation except the extraction of fish and fisheries resources on sea;
- Youth are males or females who are fifteen (15) years old but below eighteen (18) years old.

There are presently 145 NGOs that operate all over the province. Ten (10) of these are engaged in paralegal work in the coastal communities of a particular city or municipality. NGOs conducting community paralegal work with the selected LGUs are purposely selected for the study. These are the World Wildlife Fund (with Talisay City and Victorias City), the University of St. La Salle (USLS) Balayan (with Cauayan) and the Philippine Rural Reconstruction Movement (with Hinigaran). The officers of the NGOs are interviewed about their paralegal activities in the selected communities.

### **Sources of Data**

Research data are taken from the following:

Official documents (NGO programs, strategies, transcripts of dialogues, consultations, discussion with local communities, LGU executive enactments)

Interview (key informant) of NGO officials, LGU Executive Officials, PNP, Bantay Dagat and Deputies

Interview of purposely selected residents in the community who are either officers or members of Peoples Organizations (POs) classified under fisherfolk, women, and youth sectors

Interview of experts (lawyers, community workers)

### **NGO Profiles and Paralegal Activities**

There are particular NGOs conducting paralegal work in the purposely identified coastal communities. These are the World Wildlife Fund (WWF) that operates in Talisay City and Victorias City, the Philippine Rural Reconstruction Movement (PRRM) in the Municipality of Hinigaran, and the Balayan in the Municipality of Cauayan. Generally, the paralegal activities of these NGOs are similar: the conduct of PLTs in both substantive and procedural components, informal dialogues and discussions on issues and problems relating to the fisheries law and its enforcement, facilitating or actually engaging in the building of people's organization (PO), assistance to the LGU Bantay Dagat in the conduct of legal procedures, assistance to the barangay in the prevention and resolution of conflicts (intra and inter), bridging the community and the law enforcement agents (wardens, lawyers).

### **Philippine Rural Reconstruction Movement<sup>23</sup>**

Founded in 1952, PRRM is a national NGO with 20 branches and chapters. It is funded by national and international agencies to engage in development work, which are pursued mainly from four approaches: education, health, livelihood, and self-government. Paralegal work is concentrated on pursuing policy reforms and

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<sup>23</sup> Edwin Balajadia, interview by the author, 10 April 2005.

strengthening voluntary action in order to enhance community capacity to participate in the planning, advocacy and implementation of sustainable development.

In the Municipality of Hinigaran, PRRM involves itself directly with the selected barangays upon prior permission from the LGU. In particular instances, the “convergence approach” is utilized by PRRM with both the Municipality and the Barangay. This approach refers to the coordination of NGO and LGU activities in “converging” areas such as the formation of the Fisheries and Aquatic Resource Management Council (FARMC),<sup>24</sup> Bantay Dagat operations, development of Coastal Resource Management (CRM) Plan, consultation on livelihood programs, and enactment of fisheries ordinances in conformity with the Fisheries Code.

PRRM does not have a particular PLT program. Rather, it integrates the education of community residents on the marine environment and self-governance in the implementation of the program on Environmental Protection and Resource Base Management. This program builds on the capacity of the community to organize and address technical matters. As a result, existing POs are initiating the implementation of LGU programs and activities, which include those that pertain to fisheries law enforcement. Moreover, financial and logistical supports are provided by the NGO related to the implementation of the Fisheries Code.

#### **“Balayan”<sup>25</sup>**

Balayan is the community development and volunteer formation office of the University of St. La Salle (USLS)<sup>26</sup> in Bacolod City. Founded in 1987, it is the arm for the university’s direct involvement in community development efforts. While USLS provides support to LGU activities, Balayan initiates and implements its two major extension programs that are mainly implemented by volunteers. One program is the university-based “in-reach” that includes volunteer formation, social awareness and advocacy, institutional community extension, and the Christian values learning and formation. On the other hand, the community-based “out-reach” programs cater to street children, fisherfolk, and solid waste management.

Balayan generally operates separately from the LGU. It establishes a direct partnership with the fisherfolk organizations in the ten coastal barangays in the Municipality of Cauayan. Community education on the fisheries laws is provided to these POs in collaboration with NGO partner associations. In order to protect the rights of the fisherfolks, support to law enforcement agents is given, with the assistance of partner associations, particularly in the conduct of apprehensions and prosecution of fisheries violators.

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<sup>24</sup> The Philippine Fisheries Code directs the formation of FARMC in the local government to function as a consultative body to the LGU in the determination of fishing activities.

<sup>25</sup> Dexter Ian Tabujara, interview by the author, 11 April 2005.

<sup>26</sup> USLS is a private university located in Bacolod City, the capital of Negros Occidental Province.

### **World Wildlife Fund<sup>27</sup>**

WWF in Negros Occidental is one of the offices of WWF-Philippines. As a national NGO, it is engaged in various environmental activities aiming at conservation and community empowerment. One of its active involvements is on education, information and communication. In Negros Occidental, WWF is involved in researches and extension such as, among others, sources of energy (including ocean waves) and fishery production and protection (particularly blue crab which is a significant fishery export).

In the conduct of paralegal work in the cities of Talisay and Victorias, WWF does not involve itself in the community directly. Rather, it engages in a cooperative effort with the LGU and the Department of Agriculture (a national government agency). It cooperates with the LGU in the planning of seminars and trainings on the fisheries laws and, in partnership, they engage with the residents of the community in carrying out information dissemination and trainings either in the form of structured lectures or informal talks. Apart from community education, WWF is not engaged in other paralegal activities.

### **Community Information**

Negros Occidental is one of the six provinces in Western Visayas or Region VI. It is bounded on the north by the Visayan Sea, on the south by the Sulu Sea, on the southeast by the Guimaras Strait that separates it from Panay Island, and on the east by the Tanon Strait and the Province of Negros Oriental.<sup>28</sup> Its long stretch of land has a total area of 7,926.07 square kilometers or 792,607 hectares.

The province is populated by 2.6 million Negrenses, and their annual growth rate continues at 1.13%. The labour force population of fifteen years old and over is 1.875 million. Though basically an agricultural province, only 51.7% (571,000) are working on agriculture, while 39.8% (439,000) and 8.5% (94,000) are in the service and industry sectors, respectively. Of those working in agriculture, 78.6 (449,000) are situated in the urban areas and 21.3% in the rural areas. The large agricultural labour force in the urban areas is due to the congestion of population in the thirteen cities that covers a land area of 52.69% (417,602) of the provincial total. Agricultural products are primarily sugarcane and rice. However, fisheries are a major source of food and livelihood in the province. The supply comes from fishing in the surrounding municipal and national waters as well as from production of cultured species such as tilapia, milkfish, oyster and prawn.

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<sup>27</sup> Based on interviews with the fishery officers, police officers and fish wardens in the cities of Victorias and Talisay.

<sup>28</sup> All technical data are taken from Province of Negros Occidental EDP Division, "Province of Negros Occidental," <<http://www.negros-occ.gov.ph>> 07 August 2004. Also in National Statistics and Coordinating Board, "Philippine Standard Geographic Code: Negros occidental Province," <<http://www.ncsb.gov.ph>> 15 January 2005.



Table A. Community Information

	Talisay City	Victorias City	Municipality of Hinigaran	Municipality of Cauayan
Income Classification	5th class	5th class	2nd class	1st class
No. of Coastal Barangays	5	4	5	13
Coastal Length	7 kms	5 kms	15 kms	52.5 kms
Fisheries Ordinance	Ordinance No. 281 (2004) <sup>29</sup>	Ordinance No. 95-01 (1995), Ordinance No. 95-02 (1995) <sup>30</sup>	Ordinance No. 02 (1993) <sup>31</sup>	Ordinance No. 2003-78 (2003) <sup>32</sup>
Common Illegal Fishing Activities	Hulbot-hulbot de mano, super hulbot, baby trawling	Unauthorized fishing, Use of fine mesh nets, use of active gear	Unauthorized fishing, trawling on prohibited zone, use of fine mesh net, use of active gear	Unauthorized fishing, use of fine mesh net, use of active gear
Purposely Selected Barangay and Classification <sup>33</sup>	Barangay Bubog (Rural)	Barangay 6A (Urban)	Barangay Gargato (Rural)	Barangay Isio (Urban)
Fisherfolk Organization in Selected Barangay	Nakad Fisheries Multi Purpose	Barangay FARMC	Fisheries Association for Coastal Development	Talanganan Small Fisherfolk Association
Women Organization in Selected Barangay	Nakad Fisheries Multi Purpose	Barangay FARMC	Fisheries Association for Coastal Development	Talanganan Small Fisherfolk Association

<sup>29</sup> “An Act Providing for the Development, Management and Conservation of the Fisheries and Aquatic Resources and Regulating Fishing and/or Fisheries Activities in the City of Talisay, Province of Negros Occidental.”

<sup>30</sup> Municipal ordinances that are still in force: Municipal Ordinance 95-01 (An Ordinance Regulating Fishing and/or fisheries in the Municipality of Victorias, Negros Occidental and For other Purposes) and Municipal Ordinance 95-02 (An Ordinance Creating the Municipal Bantay Dagat Council for Purpose of Fully Implementing and Enforcing All Existing Laws, and Regulations Relative to the Preservation, Conservation and Protection of Aquatic Life and Marine Resources, and Eradicate and Prosecute Fishing Practices Within the Municipality of Victorias).

<sup>31</sup> “An Ordinance Regulating Fishing and/or Fisheries in the Municipality of Hinigaran, Province of Negros Occidental.”

<sup>32</sup> An Ordinance Amending and Consolidating All Fishery and Aquatic Ordinances of the Municipality of Cauayan, Negros Occidental.”

<sup>33</sup> NCSB, *supra* at note 27.

Talisay is a 5th class city and the site of fast growing residential and industrial complex developments that are largely situated contiguous to the coastal area. The City of Victorias earns a large part of its income from the Victorias Milling Company, a sugar refinery that is the source of milling discharges that threaten the city's limited municipal waters from major marine pollution. The Municipality of Hinigaran is a growing community with sugarcane production as one of its major sources of income. The Panay Gulf provides the stretch of coastal communities in Hinigaran and Cauayan with a variety of fishery resources. This is one of the vital sources of income for Cauayan on top of the tourism potentials of its lengthy coastal area.

Each of the four LGU has enacted its fishery laws with specific prohibitions and penalties against destructive fishing and fishing practices. The ordinances of Talisay City and Cauayan implement the 1998 Fisheries Code. Victorias City and Hinigaran, on the other hand, are yet to amend their ordinances to conform with the Code.

There is only one PO that exists in each of the purposely-selected barangay. These POs involve the (male) fisherfolk and women, except in Barangay 6A due to the understanding that both men and women are involved in fishing and related activities such as marketing (which the women traditionally do). In the case of Barangay 6A, the Barangay FARMC serves the purpose of PO in addition to its functions as provided for in the Fisheries Code. From observation, the POs in Hinigaran and Cauayan are well organized due to the active involvement of the PRRM and Balayan, respectively, in community organizing. Whereas in Talisay and Victorias, WWF operates more often in cooperation with the LGU in order to implement the latter's programs.

### **Acceptability of Paralegal Work**

Acceptability provides value to NGO paralegal work. There are two providers of acceptability: the local government officials and deputies providing political acceptability; and, the community residents, classified according to sectors, providing social acceptability. Generally, there are three (3) criteria that establish acceptability:

- Knowledge and understanding of the law. Awareness of the existence of the law, objective knowledge about the relevant provisions of the law, and appreciation of the importance of the law are vital to compliance, empowerment and mobilization.
- Participation in the propagation of the law and in the judicial process. The community residents, along with their individual interests and social values, inform, educate and communicate the law to the entire community. They involve themselves in community organizing, conflict resolution, and the process of apprehension and prosecution.
- Knowledge of the benefit of paralegal work to the community. Identification of the benefit of participation in paralegal work identifies the social value the participant attaches to the approach.

The above criteria of acceptability are drawn from the four (4) principles of effective law enforcement identified by Antonio A. Oposa.<sup>34</sup> These principles are:

- Law is an agreement of minds or a “social product” that must be deemed desirable and supported by mental and emotional agreement by individuals and society at large.
- Legal marketing or selling the law is necessary to promote voluntary compliance.
- Socio-cultural sensitivities and pressure points must be considered in the manner used for implementing the law.
- Swift, painful, and public punishment must be carried out in order to modify behaviour and serve as a deterrent.

When the acceptability criteria are articulated by the providers, paralegal work is acceptable. This acceptability of paralegal work becomes instrumental in contributing to the effectiveness of law enforcement. However, it is not the political acceptability but the social acceptability of paralegal work (as a community based approach) that can contribute to effective fisheries law enforcement. This is because the civil society contribution to fisheries law enforcement is vital given its non-political nature and the inadequacies of the political organization of the local government unit. Political acceptability mainly provides collaboration so the NGO can commence and pursue their programs or those that the LGU initiate.

### **Political Acceptability**

Selected key informants were interviewed to determine the political acceptability of NGO paralegal work in the selected coastal communities in Negros Occidental. Three (3) operationally established criteria<sup>35</sup> were used.

Knowledge of the existence and importance of the Philippine Fisheries Code and the Municipal/City Fisheries Ordinance and its relevant provisions.

All the key informants are knowledgeable of the national law and the local government ordinance. The knowledge of the laws is important for it serves a number of important purposes:

- it serves to remind them of the source of their functions and existence as fisheries law enforcers;
- it identifies the particular tasks that need to be performed;
- it is directly related to the complete performance of the functions;
- it provides for the human rights that need to be protected through the effective enforcement of the law;
- it identifies the activities necessary to protect the marine environment in coordination with the other stakeholders and agencies of government;

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<sup>34</sup> A.A. Oposa, “Legal marketing of environmental law,” *Journal of Comparative and International Law* 6 (1996) 273-291. In Department of Environment and Natural Resources, *supra* note 9, p. 5.

<sup>35</sup> Atty. Cecile Sabig, interview by the author, 05 November 2004.

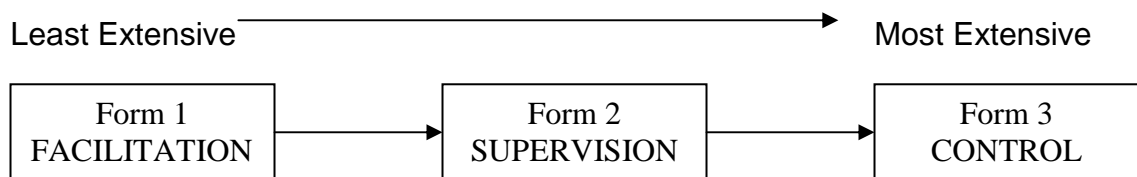
- it provides specific rules on how to address issues and problems (including complaints); and,
- it serves as a basis for liability for failure to enforce the law.

While the respondents have no full mastery of the law, they possess basic understanding of the provisions related to enforcement. This includes the provisions on the municipal waters, prohibited fishing, and the processes of apprehension and prosecution. Their knowledge of the laws are sourced from attendance in seminars and trainings conducted by the NGO, the LGU and the national government agencies such as the Bureau of Fisheries and Aquatic Resources (of the Department of Agriculture) and the Department of Environment and Natural Resources. The mass media, particularly the radio, is a critical source of information as well. It is from radio that analyses of the law and its application can be gained. Failures from personal experiences also enhance the understanding of the law. This understanding is further enhanced during the sharing of the experiences within the particular group that the respondent belongs to and with the community at large.

**Extent of Participation in Paralegal Work.**

There are three (3) forms by which local government officials participate in NGO paralegal work (see Figure 2 below). Participation in each of these forms vary and, thus, distinguishing the extent. Facilitation involves the provision of material (financial and logistics such as equipments and manpower) and technological (know-how) support. In the implementation of programs, facilitation is the most common and basic participation since there is no employment of authority except the provision of the needed assistance. The public official need not be present at any time in the implementation of the program. Facilitation is the least extensive form of participation.

Figure 2. Extent of Participation in Paralegal Work



Political authority becomes expressed when the extent of participation involves Supervision. Supervision includes facilitation and the effort to ensure the execution of the program. It requires the presence of the public official in the implementation of the activities at such instance when there is need to check on the progress. This will also require the personal contact of the public official with the NGO personnel involved in the program implementation. Some requirements are imposed on the NGO to quantify the progress of implementation. Supervision requires a more extensive form of participation.

The most extensive form of participation is Control. On top of facilitation and supervision, control involves the acts of modifying, altering, and/or nullifying the program and its implementation. Modifying results in a change that is not totally different from the existing condition. When the change becomes different, there is an alteration of the existing condition. Nullifying results to total rejection of the existing condition. Control requires the application of heavier authority in order to effect the changes.

The Municipal/City Agriculture Office is tasked with addressing matters related to coastal and fisheries management. Per the interview with the Agricultural Officers of each of the four selected municipalities and cities, they participate in the implementation of the program. However, the extent of participation varies depending on whose program is being implemented. If the program is the NGO's, the participation is at the extent of Facilitation. This includes the provision of support by way of money, food, supplies, motorboats, and manpower. Expertise and information data are also provided, such as during the conduct of seminars and trainings. On the other hand, there is Supervision if the program is that of the LGU. Meetings with, and regular updating of performance by, the NGO are conducted and required, respectively. Control is always exercised by the Municipal/City Mayor, and the Agriculture Officer advises the former whenever necessary.

The participation of the agents of the Philippine National Police (PNP) and the Bantay Dagat is at the extent only of facilitation, that is, the provision of manpower, logistic and technological (expertise) support. They point to the Agriculture Officer when it comes to Supervision. However, they have coordinating relations with the Office of the Municipal/City Agriculture. Procedurally, their main function is the execution of orders coming from authority. Their power to decide is limited only to carrying out the orders given to them.

#### **Understanding of the benefits of participation in paralegal work.**

Participation in paralegal work generally<sup>36</sup> does not entail any form of monetary compensation to LGU personnel. However, the respondents identify their participation as both responsibility and obligation due to either or both of the following: it is the implementation of the programs of the LGU from which hierarchy they belong (a "call for duty"), and it is a source of essential information and experience. As a result of this participation, the respondents gain satisfaction for performance of a function, self worth as leaders in the community and appreciation and respect from the LGU and the community residents

#### **Social Acceptability**

The social acceptability of paralegal work in the selected local government units in Negros Occidental was determined in terms of knowledge of the existence and importance of the Philippine Fisheries Code and the Municipal/City Fisheries Ordinance and its relevant provisions.

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<sup>36</sup> In some instances, monetary rewards are given as incentives for performance in apprehension of fisheries law violators.

Knowledge of the Philippine Fisheries Code and the corresponding local government ordinances is manifested by the actual identification of its existence. In support of this, there is also actual identification and description of the prominent provisions. Such knowledge is acquired through various means. Trainings and seminars about the laws conducted by NGO and LGU are formal or semi formal and structured sources of such knowledge. There are also the informal sources such as discussions with peers, family members, barangay and/or municipal officials, national government agents, and NGO personnel. The mass media (television, radio and newspaper), which are available in the subject coastal communities, are also effective tools in disseminating information about the existence of the laws. Knowledge of the laws can be acquired and enhanced by the importance the individual community resident attaches to it.

In the studied barangays, there is a higher frequency of knowledge among the selected respondents about the Philippine Fisheries Code. The knowledge about the national law is mainly sourced from informal discussions with friends and neighbours within the community. The NGO is also a source of information either through the formal and structured processes in trainings and seminars or through the informal discussions with NGO personnel. Moreover, the radio is an effective medium in making the national law known to the respondents.

There is a comparatively lower knowledge by the respondents of the local government fisheries ordinances. As in the knowledge on the national law, sources of information are basically similar. However, since radio and mass media broadcasts include mainly the national conditions rather than the municipal or city, the sources of information are limited to informal discussions with barangay residents and local government officials.

There is higher frequency of knowledge among the respondents of the prominent provisions of the national and local government legislation. These include the designation of the municipal waters, the different prohibited fishing gears and practices, the fishing rights, the apprehension and prosecution processes, and the creation and functions of FARMC.

The knowledge of the law is deemed important by the respondents as a motivation for their participation in paralegal activities and in the general management of the fisheries resources. There is a general concern that the availability of the resources is dependent upon the regulation and control imposed upon the exploitation of the resources. Both the national and local government legislations are effective tools for regulation and control. Thus, enforcement is most vital and necessary.

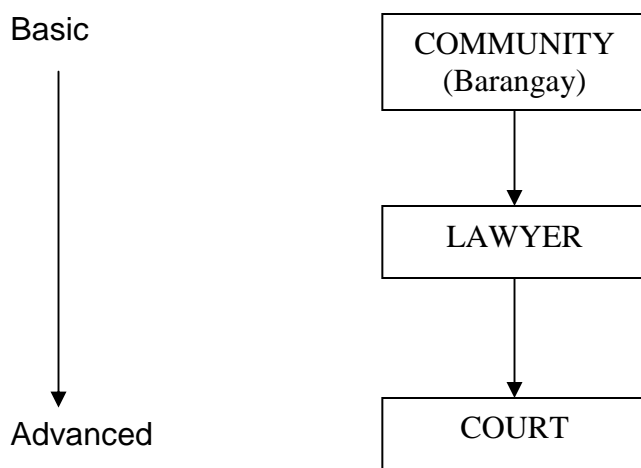
### **Levels of participation in paralegal work**

Figure 3 presents the three (3) levels in which the community residents participate in paralegal work. Participation is basic with the community and becomes more

advanced with the lawyer and the court. Participation is basic because it is easier to do. It involves the performance of common tasks of organizing, educating, assisting and mobilizing residents of the community. The participant and the community residents are more or less related and familiar with each other. On the other hand, participation becomes advanced when the task performed becomes uncommon since it requires objective knowledge of a particular expertise and involves people and experts from outside the community. These conditions render the task more difficult to perform.

Knowledge of the NGO paralegal work is necessary for participation. While the fisherfolk and the women have this knowledge, only those youths who are engaged in fishing possess it. The majority of youths are in school, and this deters them from being informed about NGO activities related to fisheries management.

Figure 3. Levels of Participation in Paralegal Work



In the barangay, paralegal work involves the following specific activities: help build and develop POs, disseminate information about the law, educate barangay residents on the law, engage them in value formation on resource preservation, provide legal advice, help in the conduct of law training, and help resolve conflicts. Respondent participation is more prominent on value formation, which is reinforced during training and gatherings when the fisheries laws are discussed and their essence analyzed. There are also trainings and seminars where the state of the environment is discussed which leads to attention towards the value of the laws. The non-formal forms of information, education and communication are essential in directing the respondents' concern towards the environment. Small group discussions, whether impromptu or habitually done (such as the afternoon gatherings where discussions are done over glasses of coconut wine), are means by which issues are discussed.

At the level of the lawyer, the following are the paralegal activities that involve respondent participation: help in getting access to the lawyer, help in getting expert legal advice, and help in getting close relationship. Research data shows that there is a gap between the respondents and the lawyer. There are four identified reasons for this. First, when the NGOs conduct paralegal work in the subject communities, they bring with them lawyers who are non-residents and who involve themselves for the most part on the provision of information about the fisheries laws. Second, there is no regular conduct of seminars and trainings where the lawyers are usually present to lecture on the law. Third, most often, the lawyers involved are practicing criminal or civil law rather than environmental law, and, thus, there are separate interests. Fourth, there are no regular lawyers brought by the NGO in the community due to the availability of the former.

Lawyers practice law either in the capital of the city or the poblacion (centre) of the municipality, and thus, outside of the respondents' barangays. Availability, distance and costs are the common reasons for the lack of effort to bring the community closer to the lawyer. With regard to costs, NGOs are not regularly present in the community and the financially handicapped respondents could not take action. Usually, it is the officers of POs that act on the matter using the organization's limited funds.

The demand for lawyers for litigation purposes is limited primarily because most fisheries violations are settled in the local government by payment of fines. Imprisonment is seldom, if not at all, an option due to the factors of time and cost. While time can be sustained with the support of NGOs the financial costs are least attractive compared to the revenues collected from fines by the local government unit.

At the level of the Court, participation is identified in the extension of the following: gathering of evidence, interview of witnesses, making witnesses available, and following up pending cases in court. The assistance given by the respondents are mainly those that involve evidences and witnesses that are situated only in the community. This is so since most fisheries violations are committed in the municipal waters adjacent to the coastal barangay and the witnesses to the violations are barangay residents.

The respondents do not assist in the following up of cases pending in court due to lack of expertise, time and money. The following up of cases is determined as the work of the NGO or the lawyer, and the respondents are not involved by the former in this activity. Moreover, pursuing such assistance individually by the respondents, or collectively through their organizations, will entail time prejudicial to their occupations as well as expense prejudicial to their financial needs.

### **Understanding of the benefits of participation in paralegal work.**

Paralegal work can generate participation if there is a conscious understanding of its purpose and benefits. The purpose is not only the ultimate protection of the marine environment. Rather, this protection can be effected if the participants in the



community identify that such protection is both a responsibility and an obligation. On the other hand, participation can also effect benefits since the protection of the resources can bring about the needed security of the community.

From the interviews, there is high frequency of responses that indicate participation is both a responsibility and obligation. For the respondents, they see participation as essential to resource protection. However, the benefits are not outrightly available. The respondents identify politics as a foremost constraint to protection. For instance, violators caught for illegal fishing are just meted very cheap fines instead of imprisonment. The fines imposed are those within the authority of the local government unit. Yet these are cheap compared to the value of catch from illegal fishing in case the violation is not caught. The imposition of fines is most convenient but this does not deter the commission of illegal fishing. From this, it is identified by the respondents that while paralegal work may be important, there are serious constraints to achieve the objective.

### **Sectoral participation including the fisherfolk, women and youth sectors.**

Sectoral participation is also vital to determining social acceptability. Occupation, gender and age are factors that determine individual interests or stakes in the management of marine resources. Also, direct and indirect relations with fisheries resources can affect commitment to resource protection and preservation. Thus, multi sectoral participation in marine resource management can contribute to a stronger community collective effort.

A significant number of the respondents in the three sectors have knowledge about the Philippine Fisheries Code as explained earlier. The provisions most common to them are those that involve about the municipal waters, which are identified as belonging to the municipality or city, as the case may be. There is also a high frequency of knowledge about prohibited fishing, fishing rights, apprehension and prosecution of fisheries law violations, and the FARMC.

On the other hand, knowledge about the Municipal/City Fisheries Ordinance is higher among the fisherfolk respondents. This is an expected outcome since by their occupation they are provided certain privileges in terms of rights over resources in the municipality of their residence. Since the local government fisheries laws are localized versions of the national law, then the knowledge as to the relevant provisions in the former law is basically the same as in the latter law.

The importance of knowing about the existence of the fisheries laws are considered more by the fisherfolk and women sectors and less by the youth sector. This is because the former are directly involved with fishing activities while the latter are indirectly involved. Fifty percent (50%) of the youth respondents are studying, which limit them from actually doing fishing activities. Although the respondents are helping in the hauling of fish catch early in the morning or in the marketing of the catch during weekends, there is limited opportunity for them to learn about the fisheries laws.

That there is a higher frequency of knowledge about the Fisheries Code among the respondents is explained by their attendance in seminars conducted by their organization and the NGO, by the broadcast in the radio, and by discussion within the family. The mass media, more prominently by radio, is an effective means of information dissemination. Moreover, while the local government ordinances are basically restatements of the national law, it is usually the latter law that are subject of family discussions or those that are heard from informal discussions by the elders in the community.

Frequency of knowledge and participation in NGO paralegal work is higher among the fisherfolk and women respondents and lesser among the youth. Again, this is explained by the direct involvement of the fisherfolks and women in almost all aspects of fishing activities (that is, from catching/gathering to marketing). The youth respondents who participate more often are those who are engaged full time in fishing activities and are not studying, as well as those who are engaged in part time fishing activities (such as during week ends, holidays, and occasionally when there is need to earn money during weekdays) and are studying.

Sectoral participation is more concentrated at the barangay level. There is more prominent participation by each sector in the information and education of Barangay residents about the fisheries laws and the formation of values necessary for marine environmental protection. At the level of the Lawyer, the fisherfolk respondents are more involved since this is regarded by the women respondents as primarily a male activity, and by the youth respondents as primarily an elder (not necessarily male) activity. Finally, at the level of the Court, there were a number of respondents participating by sector mainly because of the activities being barangay based.

The fisherfolk respondents have indicated agreement as to the responsibility and benefit from participation in paralegal work. But there are more women respondents who indicated the same agreement not because all of them are participating. Rather, their agreement is a proposal for more intense campaign and effort to conduct paralegal work and involve more community residents in the endeavour. This proposal is echoed by the youth respondents.

## SUMMARY and CONCLUSION

Negros Occidental is an island province surrounded by rich fisheries resources that are open for exploitation and abuse. While the respective local governments in the province are enforcing fisheries laws, these are insufficient to curtail illegal fishing, habitat destruction and resource depletion.

Three non-governmental organizations conduct paralegal work in the particular municipalities and cities in Negros Occidental: the “Balayan” of the University of St. La Salle operating in the Municipality of Cauayan, the Philippine Rural Reconstruction Movement in the Municipality of Hinigaran, and the World Wildlife Fund in the Cities of Victorias and Talisay. These NGOs pursue either their

programs or facilitate the implementation of programs of the LGU to empower community residents through community organizing, information and education residents (more particularly the fisherfolk and women) on the national and local fisheries laws, and mobilization to ascertain and protect their rights over the resources legally guaranteed them.

NGO paralegal activities receive political acceptability from the Municipal/City Agriculture Officers, the Philippine National Police and the deputized fish wardens or Bantay Dagat. These LGU agents possess the knowledge of the national and local fisheries laws that are necessary for the performance of their functions as law enforcers. They facilitate the accomplishment of NGO paralegal work by providing financial, manpower, logistics and technological support. In the instance when the NGO implements the LGU program, the Agriculture Officer provides supervision. From this extent, the power to control the activity rests upon the local chief executive.

On the other hand, NGO paralegal activities receive social acceptability from randomly selected community residents who are identified from three sectors, namely: fisherfolk, women and youth. Each of these sectors possesses a certain amount of knowledge of the national and local government fisheries laws. This knowledge is sourced from the NGOs in both formal and informal settings, as well as from the broadcast media. This knowledge is essential for the respondents to participate in NGO paralegal work at the level of the community. Moreover, there is a high frequency of sectoral participation at the barangay level. However, participation is less frequent at the levels of the lawyer and the court.

### **Community Effectiveness in Fisheries Law Enforcement**

Theoretically, paralegal work is an approach that can contribute to effective fisheries law enforcement given the shortcomings of government and the limitations of lawyers. Since it is essentially community based, the empowerment and mobilization of community residents, across sector, provide further strength to enforcement. This is because these residents are the direct users and beneficiaries of the resources and, thus, they hold a direct stake in imposing protection for the resources in order to enjoy the benefits.

Paralegal work in the selected coastal communities in Negros Occidental is made possible because of the active role played by NGOs. The LGU by itself does not possess the manpower and expertise to pursue the undertaking. The LGU support supplements the NGO efforts. However, there is a deficiency in the paralegal work because the community is not completely involved. While there is knowledge of the law, the respondents participate only at the basic (barangay) level. Paralegal work still has to address the economic and political reasons that inhibit the respondents from participating in activities at the advanced levels. Limited participation in the advanced levels will weaken the community and permit the continued violations of the fisheries laws. This is because the violator is able to escape with minimal penalty and without stringent opposition from the large mass of stakeholders in the community. Further, there is also the lack of sectoral participation in paralegal work,

especially with the general exclusion of the youth. Limited sectoral participation fails to cause any collective effort towards compliance from the resource users.

At the outset, the above mentioned deficiency of NGO paralegal work in the study area could restrain the community from contributing to the effectiveness of fisheries law enforcement. However, the existing social acceptability shows that there are already efforts exerted to empower the stakeholders. There is significant participation, across sectors at the barangay level, and participation is beginning at the levels of the lawyer and the court. While these are significant steps, consistent and continuous efforts are needed to achieve full empowerment.

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The background of the title section is a solid green color. On the left and right sides, there are faint, light-colored silhouettes of people's profiles facing each other, with a small heart shape between them. The title text is centered in this area.

## Co-Managing Shared Waters: A Coastal Governance Experience of Western Visayas Region, Philippines

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## ABSTRACT

Coastal ecosystems in the Philippines are under stress from the combined effects of human overexploitation and habitat destruction. In recent years, the concept of an integrated approach to coastal resource management has been adopted to address this.

This new paradigm, generally described as co-management, makes use of the participation of the different sectors (e.g. government, community) in the management process.

The passage of the Local Government Code (RA 7160) of the Philippines provided for the optimal institutional setting of fisheries co-management in the country. The Code provides that local government units (LGUs) may group themselves and coordinate their efforts for purposes beneficial to them. Thus, Coastal Resource Management Councils (CRMCs) were created as a formal partnership arrangement among LGUs.

CRMCs are multi-sectoral in nature with inter-LGU partnerships and different resource-sharing schemes. This is based on the premise that complex problems in coastal areas do not respect jurisdictional boundaries and can only be addressed in a meaningful way through collaboration with the different sectors involved and empowerment of the community.

This paper will present the experiences of the different CRMCs in Western Visayas Region, Philippines and how the different LGUs surrounding a bay area have joined together to responsibly manage their common resource. Success stories or “best practice” strategy of the CRMCs will also be highlighted for possible replication in other coastal communities.

Key words: Fisheries co-management; coastal resource management councils (CRMCs)

## INTRODUCTION

As a maritime nation, the Philippines' economy is highly dependent on the productivity of its coastal environment. The country has 7,100 islands and 18,000 kilometers of shoreline. More than 60% of its population lives in the coastal zone and almost all major cities are coastal. However, despite of its importance to Filipinos, coastal ecosystems in the Philippines are under stress. This can be attributed to the combined impacts of human overexploitation, physical disturbance, pollution, sedimentation and general neglect [1].

In recent years, the concept of an integrated approach to coastal resource management (CRM) has been adopted by development workers to address the problem. This new paradigm, generally described as co-management, makes use of the participation of national government agencies (NGAs), non-

government organizations (NGOs), and people's organizations (POs) in the management process [2, 3, 4].

The Philippines appears to provide an optimal institutional setting for fisheries co-management [5] with the passage of the Local Government Code of 1991 (Republic Act 7160) decentralizing government functions to local government units (LGUs). Specifically, Section 33 of this Code provides that local government units (LGUs) may group themselves, consolidate and coordinate their efforts, services and resources for purposes commonly beneficial to them. In line with this, Section 76 of the Fisheries Code (Republic Act 8550) also promotes an "integrated management" concept among LGUs surrounding a common resource (e.g. bays, gulfs, lakes) by creating an Integrated Fisheries and Aquatic Resources Management Councils (IFARMCs).

These policies gave rise to the co-management approach in the country which is multi-sectoral in nature, and called for inter-LGU participation and resource sharing-schemes. This is based on the fact that environmental problems transcend jurisdictional boundaries. Thus, inter- LGU alliances that seek to address common problems faced by neighbouring coastal communities created the Coastal Resource Management Councils (CRMCs).

This paper will discuss the experiences of the five CRMCs in Western Visayas Region in the Philippines, the different institutional arrangement involved in managing a common resource, and the responsibility- and resource-sharing scheme of the member-LGUs.

## COASTAL RESOURCE MANAGEMENT COUNCILS (CRMCs)

Most commonly, recognition of a resource management problem triggers co-management. Governments have turned to co-management as a means of responding to a management crisis and sometimes to an opportunity [3]. In the case of CRMCs, conflicts on municipal water<sup>a</sup> boundaries, difficulty in fisheries law enforcement, and inadequate resources for coastal resource management are the common factors that prompted the different municipalities bordering a common water resource to jointly manage it. Instead of making the resource as an area of conflict for these neighbouring LGUs, they have agreed to form a partnership. Thus a structure has been created that will specifically address the complex problems they share and will facilitate the management process. This formal structure is usually called a Coastal Resource Management Council or CRMCs. Mayors of each member-municipality signs a Memorandum of Agreement thereby agreeing to share the responsibility of managing and developing their common fishing grounds, and committing their resources for the operation of the CRMC. Generally, these CRMCs are registered with the Philippines' Securities and Exchange Commission (SEC)<sup>b</sup> thereby giving it a legal entity and institutionalizing it.

### **Profile of the CRMCs**



As of 2004, there are five (5) actively operating CRMCs in Western Visayas, a region in Central Philippines (Figure 1), namely: Banate Bay Resource Management Council, Inc. (BBRMCI); Kabankalan, Ilog, Himamaylan – Integrated Coastal Area Management Council, Inc. (KAHIL-ICAMCI); Libertad, Pandan, Sebaste and Culasi Bay Wide Management Council (LIPASECU); Northern Negros Aquatic Resources Management Advisory Council (NNARMAC); and Pilar Bay Management Council (PBMC).

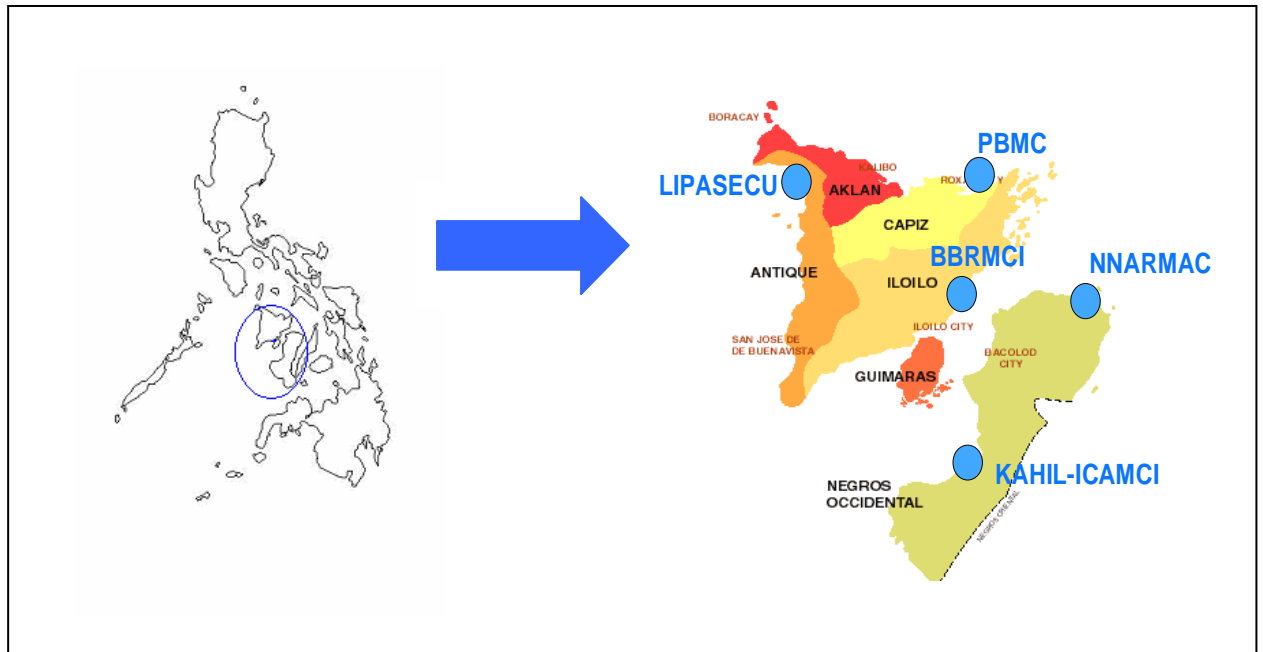


Table 1. Profile of the five CRMCs

CRMC	Common resource	Year organized/ Initiator	Number of member-LGUs	Estimated number of fisherfolk involved
BBRMCI	Banate Bay	1996/LGU	4	1,500
KAHIL-ICAMCI	Ilog Bay	1997/LGU	3	2,700
LIPASECU	Pandan Bay	1997/NGO	4	2,200
NNARMAC	Tanon Strait/ Visayan Sea	2000/LGU	9	17,000
PBMC	Pilar Bay	1997/LGU	4	3,000

### Institutional arrangements

Complex issues in coastal resource management can be best addressed through partnership and collaboration with the different stakeholders involved with it. All of the five CRMCs has multi-sectoral composition and brings together the divergent efforts of the different stakeholders. Table 2 shows the different sectors involved in the management and operation of the five CRMCs. This involvement could either be representation in the Board of Trustees of the Council, act as an advisory body, or membership in the

Operational Units. Figure 2 shows the typical organizational structure of a CRMC system.

Table 2. Sectors involved in CRMCs

Sectors	CRMCs				
	BBRMCI	KAHIL-ICAMCI	LIPASECU	NNARMAC	PBMC
Local government units (LGUs)	✓	✓	✓	✓	✓
Non-government organizations (NGOs)	✓		✓		✓
National government agencies (NGAs)	✓	✓	✓	✓	✓
Research and academic institutions	✓		✓		
People's organizations (POs)	✓	✓	✓	✓	✓
Private sectors	✓				

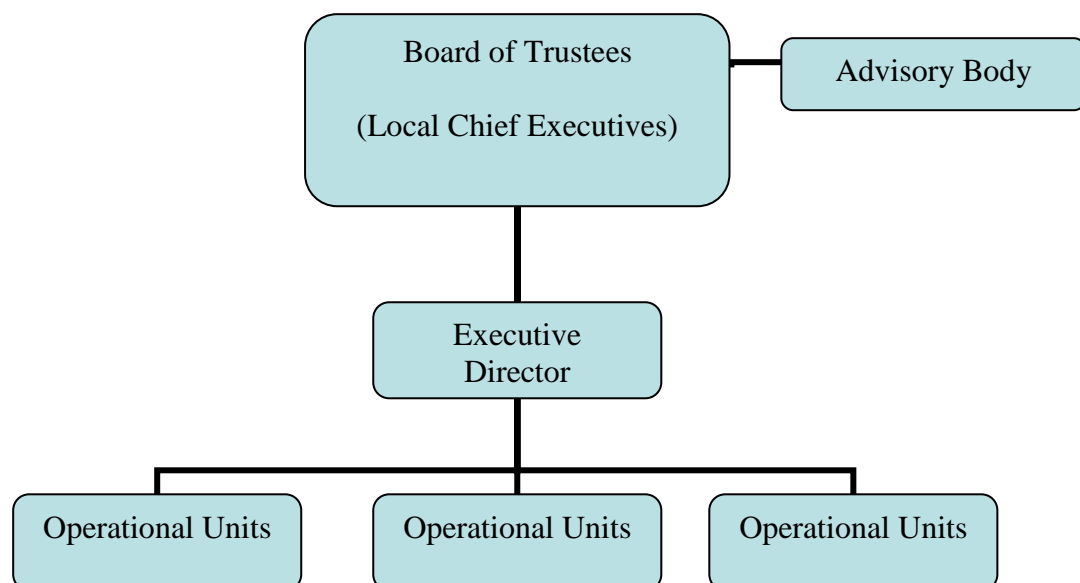


Figure 2. Typical organizational structure of a CRMC

The degree of participation and decision-making power of these sectors differs among CRMCs. LGUs play the most important role in a CRMC since they provide the mechanism for setting up of a partnership arrangement. The inability or unwillingness of LGUs to engage in cooperative, multi-jurisdictional management is a significant drawback to effective coastal resource development and management [6]. It is also the LGU who provides the overall

facilitation and coordination for planning, implementation, and approving of local regulations (e.g. enactment of a comprehensive fisheries management ordinance).

On the other hand, NGAs (e.g. Department of Agriculture, Department of Environment and Natural Resources) provide technical expertise to the CRMCs and support through issuance of needed policy reforms and agenda. NGOs help advocate for the community and foster participation. POs are community organizations that can serve as “pressure groups” to lobby for changes in or development of policy. In a CRMC, POs are most likely to be the resource users themselves who are at the same time the target beneficiaries of development efforts (e.g. livelihood project, capability-building training).

Table 2 shows that BBRMCI has the greatest number of sectors participating in its operation and projects. The roles of these sectors were formally defined in the Memorandum of Agreement on Sectoral Management Committee that they have signed with BBRMCI.

### **Partnership arrangements**

Member-LGUs of the CRMCs agree on certain partnership arrangements deemed to be beneficial to their constituents. Most CRMCs have an organizational structure in place to define the roles and responsibilities of each sector. This is to minimize possibilities of “powerplay” or leadership issues in the future. As a strategy on power-sharing, Mayors of each member-LGUs take it in turn to head the CRMC as the Chairman of the Board of Trustees.

Member-LGUs also have a cost-sharing scheme for the operation of the CRMC. Each municipality is required to remit their annual contribution to the Trust Fund of the Council. This financial counterpart usually ranges from PhP 100,000 to PhP 200,000 (approximately US\$2,000 to US\$4,000).

Some CRMCs (e.g BBRMCI, LIPASECU) have their own offices. Aside from the financial contribution of their LGUs, they also assign some of its employees to work full time for the Council. These employees are on detailed status and their salary come from their respective LGUs.

### **Evaluating the CRMCs**

According to Pomeroy and Williams [7], there are emerging conditions that appear to be central to the chances of developing and sustaining successful co-management arrangements. When more of these key conditions exist in a particular situation or system, there will be a greater chance of successful co-management. These key conditions are: clearly defined physical boundaries; resource users are identified; group cohesion; existing organizational experience; benefits exceed cost; participation by those affected; management rules enforced; legal rights to organize; cooperation and leadership at the community level; decentralization and delegation of authority; and coordination between government and community.

However, the conditions mentioned above generally focus on a type of co-management wherein only two sectors have a major role to play - the government and the community. In this type of partnership, it is primarily the government and the community of local fishers that share with the responsibility and authority in managing a fishery resource. To be able to give emphasis and evaluate a co-management institution that is multi-sectoral in nature, the author explored other indicative factors based on literature and documented researches [8, 9, 10, 11, 5], that may contribute to the success of the arrangement. These additional key conditions are: participation of other sectors; LGUs' commitment to the cooperative effort; integrated CRM plan; and existence of an organizational structure. Indicators were identified under each key condition to determine its level of presence in a particular CRMC system. Table 3 shows the rating of each key condition for each of the five CRMCs using the scale Low, Medium, and High.

Table 3. Rating of key conditions

Key Conditions (modified from Pomeroy and Williams, 1994)	BBRMCI	KAHIL- ICAMCI	LIPASECU	NNARMAC	PBMC
1. Clearly defined physical boundaries	***	**	***	**	**
2. Resource users are identified	**	***	**	**	**
3. Group cohesion	**	**	**	**	**
4. Existing organizational experience	***	**	***	**	**
5. Benefits exceeds cost	**	**	***	*	*
6. Participation by those affected	**	*	***	*	*
7. Management rules enforced	***	***	**	**	**
8. Legal rights to organize exist	***	***	***	**	***
9. Decentralization and delegation of authority	***	***	***	***	***
10. Coordination between government & community	**	**	**	**	**
11. Participation of other sectors	***	*	**	**	**
12. LGUs commitment to the cooperative effort	***	**	**	**	**
13. Integrated CRM plan	***	*	***	**	***
14. Existence of an organizational structure	***	***	**	**	**

Legend: \* - Low  
 \*\* - Medium  
 \*\*\* - High

Generally, BBRMCI and LIPASECU rated highly in most of the key conditions. These two CRMCs already have an established track record in coastal

resource management and local governance, as evidenced by the various awards they have received from different organizations. Because of their organizational experience, they have less difficulty accessing grants from external donors and funding agencies.

### **Issues and Challenges**

Because of the multi-sectoral composition of CRMC, it is always beset with issues and problems especially on the conflicting interests of the groups involved and the “power-play” issues among them. In this type of organization, more often than not, there is an individual or a sector who wants to have a “greater role” in the Council or the “greater benefits” that can be derived from it. This situation is usually aggravated by the complexity of the socio-political setting where the CRMC exists.

The most common problem encountered by the CRMCs is the conflicting provisions on penalties of fisheries violations. CRMCs have already unified the different fishery ordinances<sup>c</sup> of their member municipalities; however, stipulations for penalties differ according to LGUs discretion. This may cause conflict because illegal fishers will have the tendency to commit violations in a municipality where penalties are much lower.

Constituents of KAHIL-ICAMCI and NNARMAC complain that priorities on development efforts of their Council are concentrated on the LGU of the incumbent Chairman. This uneven distribution of development projects may have a negative effect on the commitment of other member-LGUs who have not benefited from such projects.

Most of the CRMCs also complain of their weak organizational structure wherein authorities and accountabilities are not clear. This is caused by overlapping functions and undefined roles of operational units.

### **Best Practices**

CRMCs have formulated and adopted their respective strategies in order to attain their goals. These evolving strategies are usually influenced by the type of coastal ecosystem they have and their respective socio-political arena. These successful strategies or “best practices” are documented for possible replication. Some of the “best practices” of the CRMCs included in the study are the following:

- The partnership agreement is formalized and institutionalized, and an organizational structure that clearly delineates the roles of each sector is in placed.
- Local Chief Executives have strong political will and committed to implement the goals of the partnership, transcending even politics.
- Manpower resources (full-time staff) and infrastructure (office) are available to facilitate the implementation of CRMCs plans and programs. This strengthens its identity in the community as a coastal resource management body.

- Planning is done through a participatory process integrating all the concerns of the different groups and bringing together their divergent effort.
- CRMCs invest in information, education, and communication (IEC) program. IEC materials (e.g. comic books, leaflets, and radio plugs) play a vital role in reducing social conflicts and have shown effective results in increasing awareness of the fisherfolk and in promoting the objectives of the CRMC.
- Alternative livelihood projects in the coastal area to reduce potential pressure in the coastal resource are complemented with microfinance projects.
- CRMCs encourages participation and collaboration with other sectors (e.g. NGOs, POs) in addressing complex issues in the coastal area.

## CONCLUSIONS

CRMCs are effective in coordinating the efforts of the LGUs in areas that do not follow jurisdictional boundaries (e.g. common fishing grounds). They serve as a venue to address the common concerns of the LGUs involved, and to resolve conflict associated with resource utilization. For the partnership to be sustainable, it should be formalized and institutionalized.

Efficacy of the CRMC can be enhanced through linkages with various partners and related sectors (e.g. NGAs, NGOs, POs) to be able to address complex issues. This will result to some degree of resource sharing and collaborative work.

Co-management is a political issue [7]. Thus, CRMCs should be able to transcend politics and must be shielded from short-term political pressures that could dilute its goals. It should have a management regime that is participatory. Potential benefits from its development initiatives should also be equally shared by the target beneficiaries (e.g fisherfolk).

## ACKNOWLEDGEMENT

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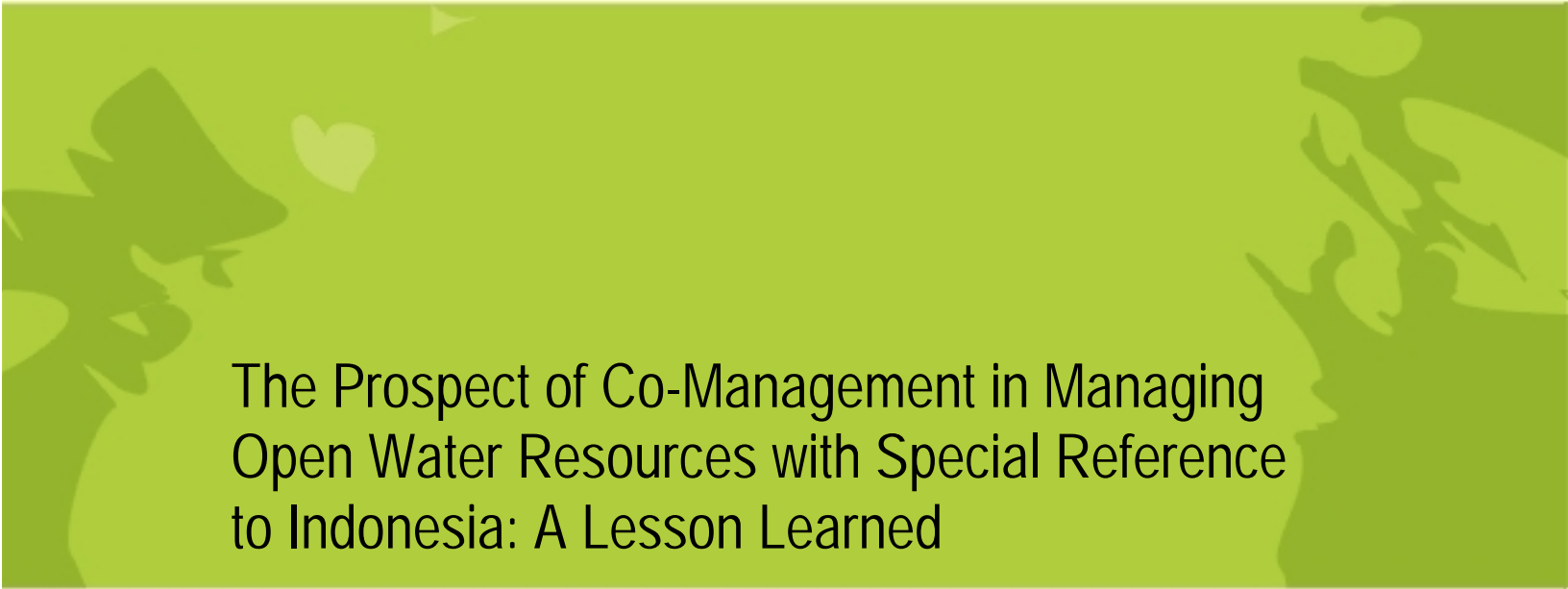
## END NOTES

a. Municipal water is defined by the Philippine Fisheries Code (RA 8550) to include not only streams, lakes, inland bodies of water and tidal waters within the municipality which are not included within the protected areas as defined under Republic Act. No.7586 (The NIPAS Law), public forest, timber lands, forest reserves or fishery reserves, but also marine waters included between two (2) lines drawn perpendicular to the general coastline from points where the boundary lines of the municipality touch the sea at low tide and a third line parallel with the general coastline including offshore islands and fifteen (15) kilometers from such coastline. Where two (2) municipalities are situated on opposite shores that there is less than thirty (30) kilometers of marine waters between them, the third line shall be equally distant from opposite shores of the respective municipalities.

b. CRMCs are registered with the Philippine's Securities and Exchange Commission (SEC) as a non-stock, non-profit organization.

c. Fishery ordinances are local laws enacted and enforced at the municipal level to regulate and to prohibit certain acts associated with fishery resources.

Conference Paper 20



## The Prospect of Co-Management in Managing Open Water Resources with Special Reference to Indonesia: A Lesson Learned

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## ABSTRACT

Indonesia is a maritime country, composed of about 17,500 islands. It has a great number of open water resources such as rivers, lakes, dams, ponds, swamps, etc. which are spread over the country. Many tribes and races are associated with these resources each with their own habits, tradition, and cultures. Indonesia is formed of thousands of islands and given such a large territory, it would be costly to set up a system for formal enforcement and surveillance for open-access resources like fisheries and access to water. Fortunately, each community has an indigenous or traditional system to manage the resources. For example: Ikan Larangan (in West Sumatra), Sasi (in Maluku), Subak (in Bali), Sedekah Laut (in Java) and so on (Susilowati, 1996; 1999). Rather than waiting for a complete formal resource management system (which would need to be set up by the government) it will be more reasonable and timely to revive the traditional system of resource management belonging to the respective communities. In short, community involvement in resource management is urgently encouraged, particularly in a developing country with limited budget like Indonesia.

This paper is attempt to compile an experience of applying a co-management approach to manage the open water resource by Susilowati (1999, 2002, 2004, 2006, 2007). An institutional analysis based on Pomeroy and William (1994) and Pinkerton (1989) with necessary modifications was applied to the respective studies.

The results indicated that there is a fairly good prospect to empower the competent stakeholders (community, government, private, independent parties) to be involved in managing the open-access resources. However, all parties need to be encouraged in order to achieve a high degree participation and commitment, and somehow to create their sense of belonging to advocate resource management. The chances of this being achieved are helped by the high degree of commitment to conservation of the resource shown by formal and informal leaders in Indonesia.

Key-words: community, resource, management, co-management, open access, Indonesia, Java.

## INTRODUCTION

Indonesia is basically an archipelago and an agricultural country. Nearly three quarters of its people live in rural areas and are involved with agricultural activities. People are mostly involved in agricultural and fisheries sectors.

Lately, the role and involvement of communities in development activities has become significant in Indonesia, especially after socio-political reforms. There is

a policy and paradigm shift in governing activities from top-down to decentralized systems. The devolvement of authority from national government towards provincial and local government has been gradually progressing since the decentralization law (law No.22 / year 1999) was promulgated in 2001. There has been a shift in the functions, tasks, authority and responsibility from centralized government to local government. Currently, most of the designed programs are now targeted at the grassroots level. Communities and related stakeholders are expected to play their roles in development requiring participation and sharing of responsibilities as the key to success to achieve sustainable development. River management in a region is also delivered to the local government with necessary coordination with central government. There are several examples of successes and failures in managing rivers in Indonesia subject to the commitment of the authorities and stakeholders in resource conservation.

One of the severe problems currently faced by city authorities in Indonesia, including Semarang and its surroundings is illegal unregulated and unreported (IUU) resettlements with most of them located on the banks of rivers or canals (Susilowati, 2004; 2006). Consequently, the environmental quality of the rivers and canals (open water resource) are deteriorating. This situation is also taking place on almost all of the urban rivers like Kaligarang, Semarang, and Babon rivers.

This paper attempts to compile several studies that have been conducted by Susilowati et al. (2002); Susilowati (2004; 2006; 2007) to provide a picture of community involvement in resource management (river). At the same time, the prospect of co-management approach and the degree of stakeholders' involvement in managing the river(s) have also been discussed in this paper.

## METHODS

(1) Study Area: there are four rivers were observed in this paper, namely: Babon; Semarang, Banjir Kanal Barat (or known as Kaligarang river) and Tuntang. All rivers are located in Semarang (Municipality and Regency).

(2) Data and Sampling: A cross-sectional survey was designed to collect the data through face-to-face personal interviews by the trained enumerators. The respondents of each study area were varied. It depended on the characteristics of the community and the presence of competent key-persons in the field. The distribution of respondents is shown in table 1.

Table 1. Distribution of respondents surveyed

No	Rivers	Respondents (persons)
1.	Babon	- Community (n=120) - Key-persons (n=30)
2.	Semarang	- Community (n=45) - Key-persons (n=30)

3.	Kaligarang	- Community (n=90) - Key-persons (n=30)
4.	Tuntang	- Community (n=90) - Key-persons (n=20)

Samples were selected by geographical clustered sampling. Primary data was considered as the main material for analysis in the each study. Training was given to all enumerators before they undertook the survey. Additional secondary data were also collected from the a number of institutions (Impact Assessment Board, River and Irrigation Office, Central Bureau of Statistics, and the Provincial, Municipal/ regency Government Offices) and some other various related publications.

(3) Method of Analysis: This paper aims to provide a comparison of the prospect of using a co-management approach in managing the open water resources in four rivers in Central Java-Indonesia. A research framework as outlined by Pomeroy dan Williams (1994) was applied to identify the prospect of co-management level; and the key conditions given by Ostrom (1990, 1992) and Pinkerton (1989) were used in this study with necessary modifications as applied in Susilowati (1999;2001a; 2001b) and Susilowati et al (2002) and Susilowati (2004; 2006; 2007). Multivariate analysis (Hair Jr. et al.,1998) has been employed and was complemented by descriptive statistics (see Mason et al., 1999; SPSS, 1996).

## RESULTS AND DISCUSSION

### Resource Description

(1) Babon River: This river is considered as one of the strategic resources in Indonesia since it serves multiple functions especially for the inhabitants along the watershed. Many industries are placed along the Babon river stream. Because of that, the Babon river can be highly polluted. In order to achieve the goals of the clean river program (prokasih), thus clean-up program should be imposed on the business activities along the river. In order to comply with this requirement awareness among the stakeholders to conserve the river is highly recommended.

The Babon river crosses over the three regions, the Semarang District in its upstream reaches and the Semarang Municipality and Demak District further downstream. The multiple use nature of the river (e.g. water source, canal disposal, mining, etc) means that there have been many transboundary environmental problems.

The research was carried out along the Babon river in the stretch under the jurisdiction of Semarang Municipality only. Further, the study areas were divided into three river segments, i.e. up stream (Rowosari village), middle stream

(Penggaron Kidul village) and down stream (Banjardowo village). In the early rainy season of 1999 the water of Babon river was sampled from several intake points. The results indicated that the BOD, COD and DO are increasing and exceed the minimum standard. The BOD ranged between 18.98 – 80.28 mg/l, while the DO was about 2.20 – 3.80 mg/l. Water temperature was between 30-33°C. Table 2 shows the chemical indicators of Babon river water.

Table 2. Chemical Condition of Babon River

Coverage	Physical Condition			Quality Standard		
	BOD (mg/l)	COD (mg/l)	DO (mg/l)	BOD	COD	DO
Upstream	18.98	28.98	2.2	6	10	$\geq 6$
Middle stream	43.20	94.20	2.2	-	-	$\geq 3$
Down stream	80.28	161.76	3.8	-	-	$\geq 3$

Note: water sample was taken in August 1999 (morning)

(2) Semarang River: 'Kali'<sup>1</sup> Semarang is the only river that flows in the heart of Semarang city. It was famous when Semarang was a Dutch colony. At that time it was used as a transport route for Chinese and Arabic traders leading to the establishment of China-town and Arabic settlements being located near the river. The river bank was also utilized by Dutch people as a place for recreation, but since then the river-side has been used for building business and office complexes now known as 'kota-lama' or the old town of Semarang. The course of the Semarang river starts from the southern part of Semarang from Kaligarang dam, then down to east until near Kariadi General Hospital and Flower market (defined as upper-stream) and passes behind Lawang Sewu building, Mayor Semarang Office, and Jalan Inspeksi in Thamrin (defined as middle-stream). To the north it goes to China town, Johar Market, Mberok Bridge and down to Java Sea (defined as lower-stream).

Until 1970's, Semarang river was still used by the community for washing, bathing and rearing fish. Even until the early 1980's many home-based producers of 'tempe-tahu' (a famous Javanese dish made from soyabeans) used this river to wash their raw materials. However, all these activities have now stopped because the river is no longer suitable for these purposes. Today, Kali Semarang is utilized by the community for sewage, disposal of garbage and drainage. The river body is becoming shallow and narrower, and the river bank is being used for illegal settlements and other purposes.

The up-stream section is partly covered by concrete and used for streets. Semarang is built on fragile alluvial soils however during city development land was reclaimed and there has been infiltration of sea water due to water supply demands. These conditions have accelerated the process of depression of the

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<sup>1</sup> local term for river

northern part of Semarang's land below sea level resulting in flooding of this area during high-tides. Meanwhile, the drainage infrastructure, including the Semarang river, has not able to cope with water flow during the rainy season. Semarang is now known as the 'flooded city' and there is even a famous satirical song with the lyric "Semarang kaline banjir".

The results of water quality analysis indicate that the Semarang river is no longer safe for drinking water standard (class I). For the standard of class II, the DO was above the required standard in the middle- and down-stream sections (T3 and T4), while the water sampled taken in T3 showed that Nitrate (NO<sub>3</sub>-N) were excessive. The Sulfide (H<sub>2</sub>S), Nitrite ((NO<sub>2</sub>-N), BOD and COD were excessive for water quality class II at all the points sampled.

(3) Kaligarang River: This is a natural river with its source being a spring located in the Ungaran mountain in the southern part of Semarang city. When it became a Dutch colony, the down-stream section of this river was enlarged and it functioned as a canal for flood control. This part is called Banjir Kanal Barat.

The upstream part of the Kaligarang River flows through agricultural land (forest and paddy field) and human settlements and is considered as the water source for Semarang City. The mid-stream section of the river is dominated by gravel and sand mining industries and human settlements. This is also where Semarang Municipality's water supply company sources water for communities in the downtown and northern parts of Semarang.

The Kaligarang River is mainly used by the community and industry to dispose of liquid waste, particularly in the down-stream section as it drains directly to the Java Sea. Agricultural irrigation and fisheries activities benefit from the river while all drainage infrastructures in the densely populated north-western part of Semarang are captured by the Kaligarang river.

The Kaligarang river often overflows during heavy rains and the water quality is adversely affected from time to time due to deforestation in upstream sections and mining activities in midstream sections. High turbidity and sedimentation cannot be avoided in the downstream sections and particularly in the estuary. The local government appears to pay little attention to maintaining the river. Therefore, the river is becoming narrower and shallow and there is heavy siltation along the river in its lower reaches. There was a particularly heavy flood on 26 January 1990 with peak water flows of around 1.5 m<sup>3</sup>/second. It caused material losses of around 8.5 billion rupiah and many hundreds of people drowned.

Along Kaligarang river, the BOD, COD and DO exceeded the quality standard. The water quality tended to deteriorate toward the downstream sections as shown in table 3.

Tabel 3

Table 3. Water Quality of Kaligarang River

No	Segment	Physical Condition			Quality standard		
		BOD mg/l	COD Mg/l	DO Mg/l	BOD	COD	DO
1	Upper	2,886	21,65	7,03	2	10	>=6
2	Middle	3,802	22,26	7,03			>=3
3	Down	7,566	40,82	7,49			>=3

Source: The Environmental Impact Management Board (Bapedalda) of Semarang Municipality, April 2004

(4) Tuntang River: This river originates in several springs from Telomoyo and Merbabu mountains. This water accumulates in Rawa Pening (a natural dam) and is used for electric power generation. The Tuntang river then flows from Semarang and Grobogan regencies on its way to the Java Sea passing through Demak regency.

During the monsoon the Tuntang water flow is significantly higher and sometimes overflows, particularly in downstream sections. The salinity of the Tuntang river is relatively high, therefore it is not suitable for agricultural irrigation. Despite this, communities along the river have no other options but to use its waters for their activities, particularly for farming, rearing the fish, etc.

The BOD, COD and of Tuntang river are about 4282 mg/l and 22.39 mg/l, while the CO is 6.38 mg/l meaning that it is still considered safe for water supply, bathing and cultivation (farming and aquaculture). The physical attributes of the Tuntang river are shown in Table 4.

Table 4. Water Quality of Tuntang River

Sampling time	Mg/l Station 1			Mg / l Station 2			Physical Condition		Quality Standard	
	BOD	COD	DO	BOD	COD	DO	BOD	COD	>6	>3
Jun 01	2.4	6.25	6.4	1.8	4.69	5.7	6	12	6	3
Jul 01	9	5.37	6.4	2.5	10.7	5.6	6	12	6	3
Aug 01	10	11.1	6.3	10	13.8	5.8	6	12	6	3
May 04	19.5	36	4.4	14	28	5	6	12	6	3
Jun 04	8	11	4.6	21	18	6.8	6	12	6	3
Jul04	17.5	12	4.7	17.5	3	6.4	6	12	6	3
Aug 04	13	14	5.1	13	16	8.7	6	12	6	3
Sept 04	18.5	22.5	5.6	14	16	7.2	6	12	6	3
Oct 04	17	20.5	5.5	13.5	16	5.2	6	12	6	3

Source: Impact Assessment Board of Semarang Regency, 2003.

## Rules and regulations

A river is considered as a strategic resource since it performs multiple functions especially for the inhabitants along its watershed. Dense housing, business activities and industries are placed along urban rivers like Semarang and Kaligarang rivers. Due to all these activities there is high potential for pollution and environmental damage. In order to achieve the goals of clean river program (prokasih), clean-production programmes need to be imposed on households, businesses, and industrial activities along the river (in urban and rural) and this has been guided by rules, formally and informally. The formal rules related to the river management are summarized in table 5.

In order to comply with the relevant rules it is important to increase awareness among the stakeholders to conserve the river. In general, people in the region perceived that the rivers have dual functions; as a place to get resources and to dispose of garbage and sewage. The level of knowledge of people along the rivers about technology and management skill is limited, and rules not consistently applied. Meanwhile the capacity of the government in surveillance and enforcement activities is very far from complete. Moreover, many people in Indonesia have an image that a river is a place to dispose the unused things, even dead pets, as reported by Lucas and Arief (2000). There is a need to re-orientate the community's attitudes on the importance of rivers. As well as proper enforcement of existing regulations, informal rules need to be revived and strengthened to provide proper guidance for the people.

Table 5. Related rules and regulations for river management in Indonesia with special reference to Central Java Province

No	Rules / Regulations	Description
1	UU No.11/ 1974	Drainage
2	UU No. 4/ 1982	Guideline for environmental management
3	UU No.27/ 1997	Guideline for environmental management (amendment)
4	UU No 7 / 2004	Guideline for water irrigation
5	PP No.22/ 1982	Water management
6	PP No.35/ 1991	River
7	PP No. 20/ 1990	Monitoring of water pollution
8	PP No. 51/ 1993	Environmental impact assessment
9	PP No. 19/ 1994	Dangerous and poisonous waste disposal management
10	PP No 27 Tahun 1999	Environmental Impact Assessment Analysis
11	PP No 82 Tahun 2001	Water quality and water pollution management
12	Presidential Decree	Conservation area management

No	Rules / Regulations	Description
	No.32/ 1990	
13	Minister of Public works Decree No. Kep.39/ PRT/ 1989	Division of river area
14	Minister of Public works Decree No. Kep.48/ PRT/ 1990	Water resources management
15	Minister of Public works Decree No. Kep.49/ PRT/ 1990	Guidelines for water resource utilisation
16	Minister of Public works Decree No. Kep.63/ PRT/ 1993	Border, watershed function, and territorial coverage of river and ex-river
17	Minister of Environment Decree No. Kep.02/ MENKLH/ 1988	Quality standard of liquid waste disposal of the running activities
18	Provincial Regulation of Central Java No. 1/ 1990	Guideline for Environmental management in Central Java
19	Provincial Regulation of Central Java No.660.1/ 26/ 1990	Water quality standard in Central Java Province
20	Provincial Regulation of Central Java No.660.1/ 27/ 1990	Classification of liquid waste disposal in Central Java Province
21	Governor of Central Java Instruction No. 660.1/ 11/ 1988	The procedure on alleviation of pollution and environmental destruction
22	Provincial Regulation of Central Java No. 20 Year 2003	Water quality and water pollution management of cross boundary regions in Central Java
23	Provincial Regulation of Central Java No 10 Year 2004	Sewage water standard

Note: UU = law; PP = national regulation

Source: Various publications, 2004.

## Interactions

(1) Resource Utilisation: Rivers in Indonesia are usually used for several purposes and different communities may have different motives in utilising a river. As perceived by the respondents in the communities rivers are utilised for: human bathing, washing and sanitation; irrigation; animal bathing; to get rid of waste; and drinking water. However the pattern of river utilisation in the different river sections also vary (upper-, middle- and down-stream).



(2) Degree of Commercialisation: In general, rivers in all the study areas are considered as an open access resource and people perceive them loosely as the common property. Although there are formal and informal rules and regulations in place, weak enforcement and surveillance, worsened by economic pressure, means that the rivers are exploited for many purposes by surrounding communities. There is no incentive for communities to comply in conserving and maintaining the river when they see others misusing the resource. Misinterpretation of the concept of decentralisation means that many of the natural resources (particularly in urban area) are potentially able to be utilised by communities, government and other stakeholders for commercial purposes.

Sand, gravel, stone, clay and water from the river are extracted by several parties, while the bank of the river is utilised for agriculture and fisheries activities. Many canoes are operated as ferries for moving people from one shore to the other. People collect fish and other creatures (e.g. worms) for commercial purposes.

(3) Pattern of interactions: Pomeroy et al. (1994) claimed that co-management involves various degrees of delegation of management responsibility and authority between the local level (resource users or community) and the state level (national, provincial, and district governments). The interaction among the stakeholders to perform the management functions (planning, organising, actuating, and controlling) in different segments of river (upper-, middle- and down-streams) are shown in the following figures.

In the upper-stream, the role of controlling the resource is by the community themselves and followed by the academician and/ or NGO, while the government shares in planning activities. Organising activities in river management are done by all related parties with the government as the facilitator. Further, actuating activities are usually done by the community and private parties.

### **Prospects for co-management**

Among the emerging conditions for successful co-management are that the more of these key conditions that exist in a particular situation or system, the greater the chance for successful co-management (Pomeroy et al., 1994). The key conditions outlined by Ostrom (1990, 1992) and Pinkerton (1989) were used with necessary modifications as applied in Susilowati (1999; 2001a; 2001b) and Susilowati et al (2003) and Susilowati (2004; 2006; 2007) to evaluate the likelihood of success for co-management approaches in the rivers under study. Key conditions were evaluated on a likert scale (1 to 5) or conventional scale (1 to 10) based on observations in the field and discussions with several competent key-persons.

Total scores for the 11 key conditions required for successful co-management in each river are shown in annexed tables (see Appendix). Overall the results indicate that prospects for co-management ranged between marginal to pretty good.

In addition, the results indicated that the sharing in understanding and responsibility among the stakeholders, as perceived by the respective communities studied, are fairly good. There is an indication that community-based management may help them to pursue the goal of resource (river) management. There is a clear need to provide empowerment for all stakeholders who should be encouraged to develop synergistic partnerships.

## CONCLUSIONS

The capacity and quality of the rivers studied are deteriorating due to a range of causes. Deforestation is most often claimed as the main factor in up-stream areas, while, mining and industrial activities were found to be the main activities accelerating the degradation of the mid-stream sections. Pollution from industries and domestic waste is becoming a significant problem for all the rivers. Illegal, unregulated and unreported (IUU) resettlements near the rivers are also a problem.

Based on an initial quick assessment using criteria provided (by [www.healthywaterways.env.qld.gov.au](http://www.healthywaterways.env.qld.gov.au)), the Babon, Semarang and Kaligarang rivers are likely to be classified as 'poor health' rivers. The chemical indicators showed that the water quality of the rivers is no longer safe for drinking water standard (class I) and results from several monitoring stations showed that the water almost no longer fulfilled the quality for recreation and gardening (class II). Hence, the involvement of the community might not be sufficient for improving the quality and capacity of the rivers. There is a need for sharing understanding, responsibility, sympathy and empathy as well as a requirement for good will from all competent stakeholders in order to build support and a sense of belonging for managing the rivers.

It is unlikely that this recommendation will be implemented in the next few years however we do not have other options. So far, the government of Semarang Municipality and Regency are paying less attention to maintaining these resources. In fact, it is as if there has been no management in managing the rivers in the study areas (and perhaps, generally in Indonesia,) for the last five years. Thus, if we do not start doing something right now, it means we let the rivers go extinct.

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## APPENDIX

Table 6. Key Conditions for Successful Co-management of Ikan Larangan, West Sumatra

No.	Key-Conditions	Phenomenon in the Field	Score **
1	Clearly defined boundaries	There are physical boundaries, so the fishers groups can have accurate knowledge of them; Boundaries using natural man-made marks	5
2	Membership is clearly defined	Individual fishers with rights to fish in the bounded fishing area and participate in area management	4
3	Group cohesion	High degree of homogeneity in terms of kinship, ethnicity, religion, local ideology, customs, and belief; There is common understanding of the problem and alternative strategies and outcomes	5
4	Existing organization	The fishers have some prior experience with traditional community-based systems and with organization	4
5	Benefit exceeds cost *	Individuals have an expectation that the benefits to be derived from participation and compliance with community- based management is exceed the cost of investments in such activities	5
6	Participation by those affected	Most individuals affected by the management arrangements are included in the group that makes and can change the arrangements	4
7	Management rule enforced	The management rules are simple, thus easily understood by the community	5
8	Legal rights to organize	The fisher group or organization has no legal rights to organize and make arrangements related to its need.	2

No.	Key-Conditions	Phenomenon in the Field	Score **
		However, in practice the fisher group or village organization has made its arrangement; There is no legislation from the government defining and clarifying local responsibility and authority. However, informally the government provide some support for ikan larangan although still in low degree	
9	Cooperation and leadership at community level	There is an incentive and willingness on the part of fishers to actively participate with time, effort, and money in fisheries management; There is an individual or core group who takes leadership responsibility for the management process	5
10	Decentralization and delegation of authority	The government has established formal policy and/or laws for decentralization of administrative functions (Regulation No. 22/1999, amendment Regulation No. 5/1974). However, delegation of management responsibility and/or authority to local government and local group organization levels has not been given	2
11	Coordination between government and community	The blue-print of establishment of coordinating body of ikan larangan is being processed by the Fisheries Office. This body is aimed to monitor the local management arrangements, resolve conflicts and reinforce local rule enforcement.	2
	Total score		43
	Average score **		3.99

Notes: Likert scale: 1, 2, 3, 4, and 5

\* Definition B/C is very subjective for each person. In the most of study area, people interpreted the B/C in terms of social context.

\*\*The average score is close to 4. This can be interpreted that the prospect for successful co-management for ikan larangan is good.

\*\*\*Definition: (1) Strongly disagree; (2) Disagree; (3) Doubtful; (4) Agree; and (5) Strongly agree. (1) Very bad; (2) Bad; (3) Neutral; (4) Good' and (5) Very good.

Table 7. Key-conditions for Successful Co-management of Babon River, Semarang

No.	Conditions	Phenomenon in the Field	Evaluation **		
			U	M	D
1	Clearly defined boundaries	There are physical boundaries, so the community groups can have accurate knowledge of them;	2	5	3
		Boundaries using natural man-made marks	2	4	3
2	Membership is clearly defined	Individual community has rights to utilize the resource in the bounded area	4	4	4
		Member of community are need to be involved in resource management	5	5	5
3	Group cohesion	High degree of homogeneity in terms of kinship, ethnicity, religion, local ideology, customs, and belief;	4	5	4
		There is common understanding of the problem and alternative strategies and outcomes	2	3	4
		Community has a good adaptation with situation changes	2	3	3
4	Existing organization	Community could understand with the existing organization	2	2	5
		The community have some prior experience with traditional Community-based systems and with organization	3	2	5
		Participative management has been applied by the community in their organisation	3	2	3
5	Benefit exceed cost *	Individuals have an expectation that the benefits to be derived from participation and compliance with community- based management is exceed the cost of investments in such activities	3	4	3
6	Participation by those affected	Most individuals affected by the management arrangements are included in the group that makes and can change the arrangements	3	4	4
7	Management rule enforced	The management rules are simple, thus easily understood by the community	3	4	3
		Enforcement in the community with participative management in placed is more effective than under the centralized ones	4	4	5
8	Legal rights to organize	The community group or organization has no legal rights to organize and make arrangements related to its need. However, in practice the community group or village organization has made its arrangement;	2	4	4
		There is no legislation from the government defining and clarifying local responsibility and authority. However, informally the government provide some support for Babon river management although still in low degree	4	4	3
9	Cooperation and leadership at community level	There is an incentive and willingness on the part of community to actively participate with time, effort, and money in Babon river management;	3	2	4
		There is an individual or core group who takes leadership responsibility for the management process	3	5	5
10	Decentralization and delegation of authority	The government has established formal policy and/or laws for decentralization of administrative functions (Regulation No. 22/1999, amendment Regulation No. 5/1974). However, delegation of management responsibility and/or authority to local government and local group organization levels has not be given	4	5	4
		Decentralisation and devolution of authority are expected in order to support the participative management in the Babon river in the future	4	5	4
11	Coordination between government and community	The blue-print of establishment of coordinating body of Babon river is being processed by the Government of Semarang (perhaps Bapedalda). This body is aimed to monitor the local management arrangements, resolve conflicts and reinforce local rule enforcement. Participative management provides an easy coordination and communication between the government and community	3	4	5
	Total score		70	83	87
	Average score **		3.33	3.90	4.13

Notes: Likert scale: 1, 2, 3, 4, and 5; U : Up stream; M : Middle stream; D: Down stream

\* Definition B/C is very subjective for each person. In the most of study area, people interpreted the B/C in terms of social context.

\*\* The average score is close to 4. This can be interpreted that the prospect for successful Co-management for Babon river is good.

\*\*\* Definition: (1) Strongly disagree; (2) Disagree; (3) Doubtful; (4) Agree; and (5) Strongly agree. (1) Very bad; (2) Bad; (3) Neutral; (4) Good' and (5) Very good.  
Source: Susilowati (1999) with necessary modification.

Table 8: The Prospect of Co-Management Approach in Managing Semarang River

No	Key-Conditions	Items	Score (1-10)		
			Up	Middle	Down
1	Clearly defined Boundaries	2	2.4	3.2	2.1
2	Membership is clearly defined	2	2.0	3.7	4.7
3	Group cohesion	2	5.1	5.3	4.6
4	Organisation	3	4.7	4.9	4.6
5	Benefit exceed cost	3	6.3	6.4	5.9
6	Participation by those affected	6	4.0	3.6	4.0
7	Management rule enforced	2	3.6	6.6	7.2
8	Legal rights to organize the management	3	2.3	6.9	6.8
9	Cooperation and leadership at community level	3	2.2	6.6	6.8
10	Decentralisation and delegation of authority	2	3.7	6.7	7.1
11	Coordination between government and community	2	6.1	6.5	6.7
	Overall	30	5.5	5.3	5.4
	Classification		Marginal	Marginal	Marginal

Source: Susilowati (1999; 2003) with necessary modification.

Table 9: The Prospect of Co-Management Approach in Managing Kaligarang River as Perceived by Key-persons

No	Key-Conditions	Items	Score (1-10)		
			Up	Middle	Down
1	Clearly defined Boundaries	2	7.3	8.2	7.7
2	Membership is clearly defined	2	7.5	8.2	7.7
3	Group cohesion	2	6.9	8.2	7.8
4	Organisation	3	7.6	7.8	7.9
5	Benefit exceed cost	3	8.5	8.2	8
6	Participation by those affected	6	7.8	7.8	7.8
7	Management rule enforced	2	7.2	7.5	7.7
8	Legal rights to organize	3	7	7.6	7.3
9	Cooperation and leadership at community level	3	7.8	8	7.8
10	Decentralisation and delegation of the authority	2	7.7	7.6	7.7
11	Coordination between government and community	2	8.2	7.6	7.6

Overall	30	7.6	7.9	7.7
Classification		Good	Good	Good

Source: Susilowati (1999; 2003, 2004) with necessary modification.

Table 10

The Prospect of Co-Management Approach in Managing Tuntang River as Perceived by Key-persons

No	Key-Conditions	Item	Evaluation (Scale: 1- 10)*				
			Central Gov't* N=2	Upper-stream N=5	Middle-stream N=5	Down-stream N=8	Keyperson (overall) N=20
1	Clearly defined Boundaries	2	5.7	7.1	6.6	3.8	5,80
2	Membership is clearly defined	2	8.0	7.1	6.9	7.5	7,38
3	Group cohesion	2	6.7	7.0	5.9	6.8	6,60
4	Organisation	3	5.9	6.5	6.2	5.4	6,00
5	Benefit exceed cost	3	6.5	7.2	6.4	4.0	6,03
6	Participation by those affected	6	5.1	6.0	7.1	5.2	5,85
7	Management rule enforced	2	7.2	7.8	6.8	5.3	6,78
8	Legal rights to organize	3	7.4	5.9	5.7	6.1	6,28
9	Cooperation and leadership at community level	3	7.1	7.1	6.2	5.0	6,35
10	Decentralisation and delegation of the authority	2	7.7	6.9	7.5	6.1	7,05
11	Coordination between government and community	2	8.0	7.0	6.4	7.9	7,33
	Overall		6,84	6,88	6,52	5,74	6,49
	Classification		Fairly	Fairly	Fairly	Marginal	Fairly

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Conference Paper 21

A green horizontal band with silhouettes of people and a heart.

## Access to Common Property Resources and Poverty Reduction: Inland Open-water Fisheries in Bangladesh

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## ABSTRACT

In Bangladesh, experiences from good practices for a Common Property Resources (CPR) identified that it is necessary to choose CPR members from the resource users with clearly defined rights to use the resource with defined physical boundary. The long-term security of tenure is a precondition for establishment of common property resources in the water bodies by the users (mainly fishers and adjoining agriculturists of the water body) themselves. The sustainability of such CPRs depends on the equity in sharing expenses and income; monitoring by the users themselves; graduated sanctions for violations of CPR rules; and development of local forums for resolving conflicts.

## INTRODUCTION

Bangladesh has a large number of government-owned water bodies (jalmohals) which have been the focus of a series of development projects over the last two decades. This paper is based on experiences from the IFAD funded Oxbow Lakes Project (OLP-2), Aquaculture Development Project (AqDP), and Sunamganj Community Based Resource Management Project (SCBRMP), but it also draws on lessons from other similar projects, like the Patuakhali-Barguna Aquaculture Development Project (PBAEP), the Fourth Fisheries Project (FFP) and the Community Based Fishery Management Project (CBFM-1 and 2). Together these projects have covered more than 200 water bodies and span a period of almost two decades.

All khas properties come under the Ministry of Land. But MoL does not directly deal with or manage these properties. There are three ways in which their management is dealt with:

- Devolution refers to the transfer of management responsibility and authority over the use of natural resources from the government to other agencies, specifically to non-government agencies.
- Decentralization refers to the transfer of management and authority to lower levels of government.
- Co-management is the system of sharing of responsibility and authority between government and non-government bodies, usually some form of organization of resource users.

There are a number of possible routes out of an open access system. One is to privatize the resource, make it the property of the lease-holder. Another is to turn it into a resource for government organizations to invest in. A third is to turn into a common property resource (CPR) of the fishers. Yet another is to turn it into the common property not of fishers, but of the community. All four methods have been tried in Bangladesh.

Longer-term leases and secure user rights, both necessary for the shift from capture fisheries to aquaculture or other forms of managed fisheries have become possible through a number of projects in Bangladesh. Of the various forms of management possible, which one is likely to have more of a poverty reducing effect?

## MANAGEMENT APPROACHES

Before the GoB-IFAD-DANIDA-BRAC, OLP-2 (ox-bow lakes project 2) project, the World Bank undertook a project, OLP-1, for government management of some lakes. These lakes were withdrawn from the auction-lease system and placed under the management of the Department of Fisheries (DoF). Teams of fishers were appointed to carry out fishing, for which they were paid 40% of the value of the catch. This was a substantial improvement in fishers' share, which remained at around 25% in privately-leased lakes.

Budgetary constraints meant that funds for operating expenses, especially stocking in the government-run lakes was often inadequate, or not released on time. As a result private money was also used to carry out stocking, which was not shown on the books. The result was that the government-run lakes were both making losses in official accounts, while allowing a number of officials to earn quite large profits. Of course, the fishers did earn their 40% share of total fishing income.

Forms of decentralization have taken a new shape with co-management, where local government organizations join with the community in managing the resource. The involvement of local government, not as a facilitator, but as a co-manager, has disadvantages as it increases opportunities for rent-seeking.

The best example of the dangers of co-management was in the Third Fisheries Project. With fisheries and local government officials, and, of course, fish traders all involved in completely unregulated and unmonitored "stocking" paid for out of public funds. Unfortunately, this practice was repeated in the Fourth Fisheries Project. As a report pointed out, "... at Boro Beel,... it was widely believed that the stocking was considerably lower than officially recorded" (Aeron-Thomas, 2005, p. 4).

In co-management the resource use decisions are made not by the users, or even the so-called community, but by a negotiation process between the government (meaning its officials) and the users or community. In this negotiation, the balance is weighted in favour of the more powerful officials.

In any case the agendas of government and users may be quite different. As pointed out with regard to the Fourth Fisheries Project, "... it was almost inevitable, given DoF priorities, that 'growth' in production rather than a concern with equity would infuse project activities," (Saleha Begum, 2004, p. 6). Further,

since DoF is “driven by numerical targets the need to ‘stock’<sup>1</sup> over-rode the need to take time to form strong CBOs (Community Based Organizations) (Rapporteur’s Report, 2005, p. 3). This is not unique to Bangladesh or to fisheries. It is common to government departments in other countries too. The experience of various co-management forestry schemes, often called Joint Forest Management, has shown that the agenda of the Forest Department, which is that of the maximization of timber growth rather than maximization of impact on the livelihoods of forest dwellers, invariably dominates the so-called Joint Forest Management committees. A study of numerous such sites in China, India and the Philippines, concluded, “...devolution policies in our case sites have reflected the conceptual frameworks and interests of foresters and, as a result, have disappointed local forest users with different expectations of devolution,” (David Edmunds, et al, 2004, p. 166).

But, government departments and local government organizations have an important role in facilitating resource management by users. In various projects, government departments and officials have played key roles in facilitating transfer of water-bodies to fishers and in establishing their user rights. Technical departments, like DoF, have additionally important roles to play in disseminating technical knowledge. As a whole, government and other state organs, have to provide various kinds of public goods that are needed for the development of fishers and fisheries.

What is needed is for a division of responsibilities between government and fishers. As pointed out with respect to forestry, “... convergence [of interests between government and forest users] was more likely to occur where local people and government officials divided roles and responsibilities in ways that enabled local people to make their own day-to-day livelihood choices with a maximum of discretion, while the state provided support for these choices and controlled the quality of public good outputs,” (David Edmunds, et al, 2004, p. 168). What may be counter-productive is for increased state involvement in fisheries in new terms, i.e. the terms of poverty reduction, just as forest departments around Asia now justify their intervention in terms of environmental protection rather than timber production targets (Guha, 2001).

While suggesting that the state should play an enabling (through appropriate legislation and decisions) and facilitating (supporting user groups to secure and establish user rights and medium- to long-term tenure), one should note that there is also a positive role for decentralization. Decentralization enables some types of decision-making to be brought geographically, even socially, closer to the affected people. However this does not mean that decisions will be taken in favour of the users. Given the domination of local elites, the opposite is more likely to occur. But the geographical closeness does make it more possible for the users, the CPR, to mobilize and try to influence local administrative

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<sup>1</sup> The DoF need to ‘stock’, also coincides with the officials’ need to maximize rent-earning opportunities.

decisions; while, when the decision are all concentrated at the district headquarters, or even at Dhaka, it would be very difficult for poor fishers to bring much influence to bear on those decisions.

Before the OLP-2 project there was a situation where a few lakes were being run under government management, with the usual problems of losses for the government exchequer, while the majority of the lakes were on auction-based, short-term leases. Stocking levels were very low in the leased lakes and most of them were in a derelict condition, overgrown with water hyacinth and other vegetation choking the water bodies. The limited benefits of lake fishing were disproportionately captured by the lease-holders, while the fishers got 25% of the catch.

The private monopoly of the lease-holder could have overcome the externality problem. But there was a problem of difficulty in or high-cost of securing user rights over all the residents of lake-shore villages. At the same time, the lake is not really divisible.<sup>2</sup> But granting a private monopoly is not only difficult to enforce (though, it should be less so now than in the early 1990s), but would, as Partha Dasgupta (2005, p. 1611) points out, grant far too much power to one person. Further, and more important for our purpose it would have a limited effect on poverty reduction – as seen the fishers are likely to get 25% of the catch, albeit of an increased catch. This, however, does bring out the point that a managed resource, with investment of capital, is likely to provide some benefits to the fishers compared to a relatively unmanaged resource with little or no investment.

## COMMON PROPERTY RESOURCES

In discussing common property resources (CPRs) it is necessary to make a distinction from “open access” systems. In open access systems there is no regulation on the persons who have access to benefits and the quantities that they can fish from the resource. In an open access system the fishers have no responsibility for maintenance of the resource. Even if access is granted only to particular persons (e.g. fishers, or members of an indigenous community) but if there is no restriction on the amount that each person can draw, then there is likely to be a degradation of the resource – if the technology permits a rate of extraction that is greater than the rate of regeneration of the resource.

One of the first requirements in setting up a common property resource (CPR) system is a specification of its members. Extraction should be restricted to a fixed number of users, chosen on the basis of some criteria. In choosing members of the user group there have been three different approaches. The first is that of making membership open to all those who belong to the relevant community. An example of this approach is the Fourth Fisheries Project (FFP). The second is

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<sup>2</sup> That is until new, costly and risky technologies like cage culture are adopted.

that of restricting membership to those who participate in the relevant form of labour (fishing or forest products extraction); examples of which are OLP-2, AqDP and CBFM. The third is to combine fishers along with other users, e.g. agriculturists in the immediate neighbourhood of the lake who draw on its waters for irrigating their fields; as has been done in the SCBRMP and in MACH.

The Fourth Fisheries Project (FFP) experience of allowing any person, and not just fishers, in the relevant community, has been analyzed in FFP papers by Mark Aeron-Thomas (2005) and Saleha Begum (2004). These studies provide useful analyses of the problems faced when no distinction is made between fisher and non-fisher community members.

“For the first round (2000-1) of sites, no requirements were set by the project as to the composition of the FMCs (Fish Management Committees), except that they had to be made up of representatives of the VDCs (Village Development Committees). As the VDCs were open to all members of the community, rather than just professional fishers, their representatives were predominantly drawn from local elites. This meant that non-fishers were quickly and firmly in control,” (Aeron-Thomas, 2005, p.24). The project responded by changing procedures for the second round (2001-2) of sites, with the VDC being replaced by a Fisheries Sub-Committee (FSC) in each village, and with a requirement that 75-80% of both committees and two out of three office bearers should be genuine fishers.

Non-fishers used their general dominance of local politics, and their ability to provide the capital required for stocking which shows is that it is important not only to specify the sections from whom members of the CPR will be drawn, but also to work out methods of providing access to capital, such that members can provide equal amounts, or equal shares, of capital to the CPR. This, as will be seen later on, is quite important for fishers to establish or retain control over the CPR enterprise.

It is generally better to form a group of the users (e.g. irrigators, fishers, forest users, etc.), rather than the general population of the area.<sup>3</sup> There are a number of reasons for this:

- There are divergent interests between users and others.
- User groups have a common material interest in using and managing the resource, even, perhaps, sustainably.
- User groups would be more homogenous than the general population of the area.
- Both benefits and costs would be more transparent in a user group and the returns are likely to make participation worthwhile.
- They are more likely to be able to develop pro-CPR norms of social functioning.

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<sup>3</sup> This draws on Harry Blair (1996).

The inclusion of only fishers can be attempted through a condition that membership is conditional on participation in fishing, say, for at least 75% or so of fishing days, as was introduced in OLP-2, and has since been adopted in most other projects. But even this is not fool-proof. In a situation where the fishers, are weak, there could be elaborate fictions to show that all members are participating in fishing, when that is actually not the case. But by restricting members to fishers it is at least possible to reduce the incidence of open domination of CPRs by the elite. In India, community-based aquaculture is also organized on the basis of “common interest groups” (Radheshyam, 2001).

At the same time, the phrase restricting members to fishers may itself need to be extended to include other poor or other relevant users. The first point arises when the number of fishers living near the lake is too few for a CPR. If it becomes necessary to increase the number of members, this could be done by including other poor, who are willing to learn and regularly participate in fishing. This, of course, will only be possible if the returns from fishing are somewhat more than the returns from the alternative, say, daily wage labour.

Another manner in which it could be necessary or beneficial for the CPR to extend its membership beyond fishers, is, for instance, that where the silted up portions of the beel, though registered as khas land, have been occupied by agriculturists. This has been done in both SCBRMP and CBFM, in the interest of getting more support for the CPR. Most of these agriculturists are quite small holders and there is a restriction that they can only make an equal contribution to the Beel User Group's (BUG's) finances. They cannot contribute more of the capital and thus claim more of the profits.

Establishing user rights of the fishers CPR over the resource is something that is difficult for CPR members to do on their own. They require support from the local administration and from the community around them. In one way or the other, the establishment and spread of a social norm that accepts the CPR on the water-body, is necessary for setting up and running a CPR. Without this social norm, which itself can be brought about through a number of attempts, each perhaps less conflict-ridden than the last, guarding would be too expensive and might make the water-body itself unprofitable to manage. Social fencing, through an accepted social norm, can considerably reduce the need for guarding, i.e. reduce the transaction costs and increase the return to invested capital and labour.

## WOMEN IN FISHERIES

Although women generally do not get involved directly in fishing in most parts of Bangladesh, there are many stages of chain between boat and consumption where women are involved.

Starting with the well-known Mymensingh Aquaculture Extension Project there has been an increasing involvement of women in aquaculture. That project



showed that women, possibly because of their greater time spent in and around the homestead, are able to achieve higher productivity than men in household ponds. OLP-2 initiated a process of women acquiring user rights in ponds on khas lands, though it was often difficult for women to retain their control over these ponds, in the face of attempts of various politically stronger male groups to seize their ponds. AqDP successfully combined training in pond aquaculture with credit, to enable women to set up commercial fisheries in household ponds that had formerly been used for fish culture only occasionally and fitfully. In both CBFM and SCBRMP women have been playing a role in sorting fish and drying fish as a commercial activity.

Combining all these varied tasks within the fish value chain, and adapting a holistic view of this value chain, will enable making a policy for women's involvement in fisheries. SCBRMP has, for instance, decided that women would form 25% of members of the Beel User Groups (BUGs) and have at least one member in the Beel Management Committee (BMC).

Gender equality is both a goal of poverty reduction and an instrument for the same. Thus, when there is an attempt to link fisheries with poverty reduction and the PRSP, it is necessary to consider the manner in which gender concerns can be incorporated in the fishery sector, even in capture in open or semi-open water bodies.

## CPR BOUNDARIES

In order to establish a CPR it is necessary to have a clear category of members who are entitled to participate and share in the use of the resource. It is also necessary to have a clear physical boundary, within which the CPR has the authority to manage the fishery. With lakes it is often difficult to set up such clear boundaries. The ox-bow lakes can be turned, with screens or embankments, into water-bodies that are closed for all practical purposes. But with beels in the haor region, such enclosure is not only difficult, but also not even desirable. The existence of mobile fish is essential to the productivity of these water-bodies. In the monsoon period, and until the lakes are more-or-less isolated from each other in the dry season, the whole haor is a single sheet of water. When management is restricted just to the beels, what usually happens is that CPR members guard against poaching in their own areas, and simultaneously go out to poach in other, possibly unguarded areas or in the open waters of the haor. This is especially so in the monsoon period when the fishers have no alternative work. This monsoon fishing is made even more destructive by the fact that this is the spawning period, therefore affecting the productivity of the fishery by a multiple of the fish caught.

The strong externalities within beels in a haor region (a vast flood-plain) makes it necessary to try and bring the whole haor within the management system. Only in that way will it be possible to internalize the benefits of managing the resource,

as, for instance, by making effective a ban on fishing in the spawning period. Thus, as both the MACH and SCBRMP projects have decided, it is necessary to bring under management “entire ecological and hydrological units to the extent possible” (MACH, 2002, p. 85)

## ESTABLISHING USER RIGHTS

There has been one important effect common to all of the various development interventions. As compared to the situation in the early 90s, now there is an acceptance of the user rights of the designated lease-holder, whether it is a private individual, a fishers’ group, government department or the community. This, however, is so only for the more-or-less closed baors (ox-bow lakes). Not much of active guarding is needed. Or, when there is poaching it is not a matter of right, but one of stealing. It is not a coincidence that this has occurred in water-bodies where aquaculture has more or less replaced capture fisheries, and fish are the result of stocking and even fertilization with inorganic and organic fertilizers. There is labour and capital involved in all these activities, and not just in the catching of fish, as with capture fisheries.

In the open beels, which are only isolated from the floodplains in the dry season, there is much more guarding required. Again, it is not a coincidence that fishing in the beel is mainly a matter of capture fishery and only secondarily a matter of stocking, i.e. of investment of capital and labour in activities other than capture of fish.

Initially the transaction costs involved in investment in lakes were quite high and years were taken to establish these rights. In the early- to mid-90s OLP-2 it took years and a lot of labour in guarding to establish user rights. But at the time of the AqDP in this decade, it has neither taken as long nor required as much guarding to establish user rights. In a sense, the change in norms of access to resources, identified by Douglas North (2005) as the critical issue in development has, to some extent, been established with regard to leased lakes but this is not yet true in large parts of the flood plain, the haors, which are still regarded as open access. Fishers think nothing of guarding their own beels, but catching fish in the rest of the haor, or even in unguarded beels. Fishing in the haors or even beels is still often a matter of either stealth (fishing in a small boat that can pass unseen in the mist), or might (fishing or guarding with armed parties).

The establishment of user rights of the lessee, where they are fishers, has also become easier because of positive changes in attitudes of various sections of the government. In the early 90s, despite decisions in Dhaka on the handover of baors to the OLP-2, it was not an easy job to actually secure those transfers. There were various obstacles and negotiations at all levels of administration. But more recently, both with the AqDP and the SCBRMP projects, such handovers have become somewhat easier, once decisions are secured in Dhaka. In the SCBRMP sections of the local administration were also willing to quickly

intervene to resolve disputed claims and establish boundaries. All this has accelerated the process of securing user rights of the lessees, where they are fishers. Of course, there are still at times court cases to be resolved. And there are instances (e.g Raisha Beel) where the controlling group stated plainly that they had paid a large sum to the DC's office to secure the lease. But this is a far cry from the situation where there frequent obstacles at every stage<sup>4</sup>.

In their struggles against former lease-holders or other local elites, and in establishing the user rights of the CPR, fishers necessarily have to rely on an overall acceptance of these user rights by those living around the baors. If large numbers people who are not CPR members continue to catch fish, as they used to before the project, then the CPR members investing in stocking fingerlings would not get a return on this investment. Securing acceptance of the CPR's user rights is thus crucial to the success of the project.

This has been done through a number of channels. The first was to give user rights to the fishers and other poor living around the baors. Those who used to be the main persons catching fish were themselves made the owners of the fishing rights (as CPR members). Although the CPR could establish their user rights just through guarding to prevent others fishing, this would be very costly, whether in terms of their own time (if the CPR members act as guards themselves), or in terms of money (when guards are hired). In fact, any such change in access rights, turning what was formerly an open access system (either because there was no lease, or the lease was not rigorously enforced) into a managed CPR, depends crucially on social acceptance of the change.

Besides the CPR itself, an important factor in establishing user rights is the stand taken by local officials. Where local government officers, like UNO, or department officers, as of DoF or LGED, go to support the CPRs, and where there are visits from higher officials, then there is a demonstration of the measure of official support. This support is very important in gaining social acceptance of the fishers using the baor as their CPR. The NGO too plays a role, not only in organizing the CPR but also in showing its support to the CPR and helping them to negotiate with the local power structure.

The roads built by OLP-2 and AqDP right up to the fish landing centres at each baor have improved the local law and order situation. The clean environment of the landing centre and the lake waters make it a scenic spot. Many persons, such as college students, and officials and their families visit some of these baors on holidays. This too increases the social contacts of the CPRs and increases their social capital.

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<sup>4</sup> There remains a problem of excessive lease charges for some water bodies. These often bear no relation to the productivity of the resource, but can be bid up by influential elites who then use the legal system to avoid making actual payments. In other systems wealthy individuals seem motivated to pay over the odds for a lease because of apparent status it confers.

What one can see is that empowerment, as the ability to bring about and sustain a change, is a combination of a number of factors. First, there is the handover of the baors to the CPRs. Second, there is the support for this change from officials. Third, is the acceptance of the general local population and their support. Numerous actions of the CPRs have helped bring about this general acceptance, even if these actions were not necessarily consciously aimed at achieving such acceptance. Finally, what counts in empowerment is the power of numbers, both in terms of the number of members and in terms of the amount of capital deployed in the baor as a production unit.

## LEASING POLICY

The difficulty in establishing user rights when combined with the dis-incentive effect of short-term leases, further reduces the return from stocking or semi-intensive aquaculture. When lake fishing shifts from capture to semi-intensive (stocking, without fertilizer use) or intensive (stocking plus fertilizer use) some infrastructure is needed. Landing platforms are needed with connections to the main roads connecting to the markets, so as to be able to carry at a reasonable cost the high volume of fish to the market. Even if the government were to provide this infrastructure, with a short lease there would be no incentive to maintain or improve infrastructure.

Along with this infrastructure investment disincentive, short term leases encourage destructive methods of fishing. There is an attempt to fish out the lake at the end of every year. In the beels this has led to the particularly destructive method of de-watering to catch all possible fish. This reduces the numbers of breeding fish for the next season, leading, over time, to a fall in fish stocks.

Projects, like OLP-2, AqDP, SCBRMP, CBFM-2 and MACH have secured long-term leases, usually of 10 years at a time, but for up to 20 or even 50 years (as in the case of OLP-2).

## CIRCUMSTANCES FOR A FUNCTIONING CPR GROUP

Management of a CPR is usually governed by an agreement between the members to cooperate in the managing of the resource and in sharing its benefits. The agreement, if not indefinite, is expected to last at least as long as the group has the lease or access to the resource. What binds the group together is that they have a joint lease over the water-bodies.

Under what conditions is such an agreement to equal sharing likely to last? This question is important given that some members could, at least for some time, break the agreement and corner a higher share of the benefits. Agreement can be kept if all parties discount the future benefits from the CPR at a low enough rate (Partha Dasgupta, 2005). Within this general situation of a low discounting of

future incomes from the CPR, there are a number of specific features that will promote cooperation.

Agreements are less likely to be broken when members care about each other, or have inter-dependent utilities; or, if they have a pro-social disposition however the fishing groups in most of the projects under consideration do not form a homogenous social group. They tend to be a mixture of traditional fishers and other poor, combining Hindus and Muslims and do not have a history of prior collective action. Breaking an agreement to equal sharing of returns is not likely to meet much or even any social ostracism.

Such a situation only reinforces the point that, where there are temptations to break agreements, because the returns are large, then there is a need for punishment for breaking the agreement. The enforcement of the agreement could be either through mutual enforcement by the members or through external enforcement. Mutual enforcement is of course the preferred alternative. If ordinary members could be counted upon to regularly monitor activities of the committee members, and make credible threats of sanctions for those breaking the norms, then it may be quite easy to keep CPRs functioning

Self-monitoring can be taken a step further by peer monitoring. This has been introduced in SCBRMP, where members from one Credit Organization (CO) audit the accounts of another CO. But besides having the knowledge to monitor, the members of the CPR also need to have the power to impose sanctions on those breaking the rules. This is easier said than done. Removing an errant member, or refusing to transact with him for one or a number of years, is not so easy, when the target is one who as a committee member is likely to have developed connections with power brokers in the locality, even if he did not already have them at the inception of the CPR – removing such a member is difficult. This can then lead to a situation where a new equilibrium is reached, wherein some get a higher share of the benefits than others (Partha Dasgupta 2005).

Why do the ordinary members settle for an unequal share? It must be that their benefits are still more than they could otherwise expect. "... even though the agreement is to share the benefits of cooperation unequally, both parties gain from cooperation" (Partha Dasgupta, 2005, p. 1618) and, thus, the CPR continues to exist, although with unequal benefits to members. While this is worse than the situation of a democratically functioning CPR, it is still likely to be better than a situation where there has been no history of a democratically-functioning CPR. In a sense, those trying to corner a disproportionate share of benefits, cannot just take their control of the CPR for granted but, instead, have to buy-off other members.

The biggest source of uncertainty in CPR management in Bangladesh is that of political or bureaucratic interference in the membership of the CPR management

group. Another possible deterioration can take place where persons from outside the group (local elite or officials) free-ride on the CPR and extract a large share of its income. A third possible deterioration relates to the necessity of raising working capital and stocking and other expenses. This usually results in tied transactions with fish traders and fingerling suppliers which will probably affect prices and quality. This can also result in collusion between the traders and the office-bearers of the CPR resulting in the effective takeover of the financial transactions of the CPR, as happened in some OLP-2 baors, after the withdrawal of BRAC from supplying credit.

The above example points to the importance of maintaining equal contributions of capital from each member, preferably through a formal credit mechanism. A CPR with unequal contributions is more likely to be taken over, by those who supply more or most of the capital required. This also leads to a corollary: a beel, where there is no or little stocking and thus capital requirements are also low, is less likely to be a target for takeover by financial interests, as compared to a baor, where stocking levels and capital requirements are both high.

## THE ROLE OF NGOs

NGOs have played an important role in all of the CPR projects, except the SCBRMP. They have had two functions. One is to form and facilitate CPR groups. The other is to provide credit, usually as micro-credit to the members but meant for collective use by the CPR.

Credit for stocking is a form of working capital. Finance for stocking can be procured in either one or a combination of three ways. It can be provided by MFIs, or even commercial banks. It can be provided by fingerling suppliers or fish traders, usually the wholesale traders, arathdars. It can also be provided through the CPR's own savings.

The facilitation of CPR formation and support in establishing user rights is another function that NGOs have often been contracted to provide. But NGOs in Bangladesh are basically MFIs. Micro-credit is their core business and all else tends to be subordinated to the goal of giving and recovering credit. Consequently they tend to minimize their other facilitating activities. Experience in the Fourth Fisheries Project, where a number of NGOs, big and small, were involved, showed that a number of NGOs, particularly the small, local NGOs, tended to side with the local elite in monopolizing returns from fishing and sidelining fishers from any real involvement in management<sup>5</sup>.

Two points come up with regard to the involvement of NGOs. First, it is better to involve national, or large NGOs, rather than small, local NGOs. The local NGOs

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<sup>5</sup> See Aeron-Thomas (2005) for details of NGO functioning in the Fourth Fisheries Project, some of it in collusion with DoF officials.

tend to be more linked to local power structures, or unwilling to act in the interests of fishers to confront local power structures. It would then be preferable to involve large, national NGOs, which have a reputation to maintain. This need to maintain a reputation would work in favour of checking local units and even taking action if they collude with the local elite against the interests of the fishers.

At the same time, one cannot simply presume that the interests of the NGO necessarily coincide with those of the project, or the CPR. As the failure of BRAC to fulfil its contracted post-project responsibilities in OLP-2 shows, it is also necessary to devise an incentive system for NGOs, so that it is in their interests to continue post-project support to the CPRs.

## CONFLICT RESOLUTION

In any group activity there will always be conflicts often due to domination of the group by a few individuals. Ways of trying to check such domination are through rotating leadership, spreading knowledge, technical and marketing, and mutual enforcement of norms.

Not all of the problems can be solved within the group meaning that some form of conflict resolution process becomes necessary. During the life of a project this is usually through project officials and NGOs. But what happens after a project closes and the CPR group has to manage its own affairs? An important consideration is that it should be local and thus available for low cost and also able to intervene in a timely manner.

There are four ways in which the problem of a forum for conflict resolution has been approached:

- CPR groups can be part of a nested hierarchy, and higher levels, such as cluster-level CPR committee in a haor, could serve as the dispute resolution forum for individual beel CPRs, both for their own internal problems and in disputes between beel CPRs.
- Disputes could be resolved by recourse to the state, however rent-seeking by state officials, may make this costly.
- There have been attempts to develop some sort of local-level dispute resolution mechanisms, in the form of the village shalish. But these have not yet taken off. And, to the extent they exist, they are heavily biased against the poor, women and minorities. The problem with the shalish is not a matter of training to make them more responsive to those they are meant to serve. It is a matter of the shalish having deep roots in the existing socio-political structure of domination by rich men.
- NGOs could play the role of arbitrators (Anna Knox and Ruth Meinzen-Dick, 2001). As experience in the OLP-2 showed, it is preferable to have not just the NGO but also officials of the relevant government department, DoF, LGED, or whichever department is connected with the CPRs. Having both NGO and departmental officials in a conflict resolution or appeals

forum, gives more scope for the weaker persons or groups within a CPR to find someone who will be willing to listen to their appeal, although even this is not fool-proof (Aeron-Thomas, 2005).

## POVERTY AND SOCIAL CAPITAL IMPACTS

Taking control of baors as common-property resources, means there is frequent interaction between members of the CPR. Besides working together, they have also build relations as social groups, often participating jointly in festivals (both Hindu and Muslim) and other events. Relations between group members are strengthened by the practice of giving members wages for fishing days on which they are genuinely sick and so cannot work with the rest of the group. The increased interaction between group members, going beyond work requirements, leads to closer relationships and strengthens their internal social capital.

CPR members have seen a substantial change in their economic and social status. In terms of income and consumption status, fishers in well-managed baors of OLP-2, from having been among the poorest in the villages before the project, had come up to a lower-middle status by the end of the project. They felt that they had clearly moved out of poverty. Of course, not all would have made such a move out of poverty, but they felt that many of them had made this move. One way in which this was reflected was in the common understanding that their children, girls and boys alike, would study as long as they could, even beyond high school. Insufficient income was no longer felt to be a reason to stop their studies.

But in Talbaria (AqDP), one of the autocratically-managed baors, where fishers just get a wage of Tk.100 per fishing day (or 20% of the catch in other such baors) that the fishers, though generally very quiet, said that they were poor before the project and are remain poor now.

The change in economic status of CPR members in well-managed baors is reinforced by the fact that CPRs are fairly large economic units, some with net annual income running into Tk.1.75 million (Sirishdia baor, AqDP), Tk.2.0 million (Chand Beel, AqDP), or even more than Tk.2 million (Bahadurpur and Porapara of OLP-2). For such medium-size enterprises, it is not difficult to make donations of Tk.10,000 for local social causes, something that hardly any individuals in these villages would be able to do. The CPRs have used their economic strength to support a variety of local social causes, from primary schools to hospitals and sports clubs.

In the course of the Project the CPR committee members, in particular, have interacted with various government officials and many officials, both from Bangladesh and outside, have visited the baors to see the project. All this contributes to increasing the social contacts of the fishers. With this there is also a new dignity, typified in some leaders being addressed as, for example, "Haldar



Mahashay”, meaning “Mr. Haldar”, rather than the earlier “jhele”, which is a pejorative for the Hindu fishing caste.

To establish the lease rights of the CPRs the fishers, with support from the LNGO and some government officials, have had to struggle against former lease holders and sections of the local elite. These struggles have strengthened their internal cohesion and success has given them a confidence which is noticeable in their manner of speaking and behaving. The hesitation to speak with officials, noticeable at the beginning of the project, is no longer there. Of course, this has not changed uniformly among members, with the leaders much more transformed than others. But over all there is a confidence and cheerfulness that were formerly not present.

## CONCLUSION

In concluding this review, we shall sum up some of the desirable design features, or good practices, for a CPR, as they have emerged from the review. Many of these desirable design features correspond to those which in the literature have also been identified as being necessary for a successful CPR (for example, Ostrom, 1990 and 1999).

- CPR members chosen from the users (fishers and/or agriculturists adjoining the beel);
- Clearly defined social boundaries: A set of individuals with rights to use the resource and its physical boundary itself being defined;
- Secure and medium- to long-term lease at an affordable cost;
- Equity in sharing expenses and income, i.e. benefits from the CPR;
- Democratic, transparent and inclusive management of the CPR, with support from external agencies, relevant departments of the state and NGOs;
- Monitoring by the users themselves;
- Graduated sanctions for violations of CPR rules; and
- Conflict-resolution mechanism, such that there can be quick access to low-cost, local forums for resolving conflicts.

For the above a set of enabling conditions is also necessary:

- Government decision to handover lakes to CPRs of users on secure and medium- to long-term leases at reasonable cost;
- Support from relevant government departments and officials to CPRs establishing secure user rights and the boundaries of their resource;
- Infrastructure development to meet the new needs of increased fish production and to bring the water body into the orbit of state governance; and
- Provision of working capital through an MFI or other such official (as against traders' credit) source of credit.

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A green horizontal band with silhouettes of people and a heart. The silhouettes are in a darker shade of green, and the heart is a lighter shade. The background of the band is a medium green color.

## Community Management as Part of the Bangladesh Inland Capture Fisheries Strategy

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## ABSTRACT

Bangladesh has had comprehensive experience of community based management for inland capture fisheries from several projects (revenue and externally funded) over the last 10 to 15 years. The lessons were extensively used for the elaboration of a strategy and a programme, which will seek to consolidate gains in and expansion of community based management linked to institutional and legal reform and a recognition and strengthening of the roles of civil society and the private sector.

The Ministry of Fisheries and Livestock adopted the National Fisheries Strategy in January 2006. It had been developed by the Department of Fisheries over an extended period through a consultative process involving all relevant stakeholders. The strategy sets out to guide the implementation of the National Fisheries Policy, the PRSP and the Road Map for PRSP.

The strategy covers eight areas (“sub-strategies”); inland capture fisheries, marine capture fisheries, aquaculture, aquaculture extension, shrimp culture, quality control, human resources development, and monitoring and evaluation.

The strategy has a pro-poor focus and guiding principles are people’s participation for community based resource management, decentralization of planning and decision making, conservation and enhancement of fish stocks, protection against habitat destruction, pollution, and degradation of bio-diversity. The strategy emphasizes the need for reform of access rights (lease systems) and institutional development for decentralization and effective public sector service delivery.

## INTRODUCTION

The National Fisheries Strategy was adopted by the Ministry of Fisheries and Livestock in Bangladesh in January 2006. Subsequently the Department of Fisheries also prepared an Action Plan for implementation of the strategy. Through a parallel process, the Ministry of Fisheries and Livestock developed a Road Map for implementation of fisheries aspects of the Bangladesh Poverty Reduction Strategy Paper (PRSP). The Road Map was also approved in 2006. The approaches in the three documents are the same and they cover the same issues.

The Road Map and the National Fisheries Strategy identify threats to the inland capture fisheries from overexploitation, habitat destruction and pollution, and devise measures to overcome the challenges for the benefit of poor fisher households and other resource users. Both advocate the promotion of community based fisheries management as a poverty reduction approach in line with aims to decentralise management, as well as giving genuine resource users a say in management matters. The Road Map emphasizes the role of inland capture fisheries for poverty reduction.

The Department of Fisheries is at present preparing a Programme for Inland Capture Fisheries Development for the implementation of the strategy and Road Map. The 15 year programme will address priority issues for inland capture fisheries development and management. It has ambitious aims and targets for the expansion of community based inland capture fisheries in Bangladesh.

The National Fisheries Strategy, with a focus on the Inland Capture Fisheries Sub-strategy, and the Programme are briefly presented in this paper. Further details on the strategy and action plan have been published in a report by the Department of Fisheries (2006).

## THE NATIONAL FISHERIES STRATEGY

The National Fisheries Strategy was developed by the Department of Fisheries through a consultative process involving and engaging a wide range of stakeholders and considering the then ongoing preparation of the PRSP. The strategy has eight sub-strategies addressing

- inland capture fisheries
- marine capture fisheries
- aquaculture
- aquaculture extension
- shrimp
- quality control
- human resources development, and
- monitoring and evaluation

### **Objectives**

The main objective of the National Fisheries Strategy is to: *“Encourage the various partners and agencies utilizing or supporting the management of the fisheries resource to promote its sustainable use in order to meet the objectives of the National Fisheries Policy and other policies guiding the development in Bangladesh.”*

The strategy also sets out to formulate a mission statement or vision for the Department of Fisheries and its role in this process: *“To provide support to the sector so that Bangladesh’s fisheries resources can be managed sustainably for optimum economic and social benefits through the cooperation of all stakeholders.”*

There are key concepts which apply to all sub-strategies, such as long term objective planning, decentralization, people’s participation, coordination and collaboration of all stakeholders, the regulatory framework, focus on the poor, gender, alternative income generation and environmental management.

Community based approaches to fisheries management figure prominently in the sub-strategy for Inland Capture Fisheries, with the following objective: *“To attain sustainable*

management of the inland capture fisheries for the local fishing and user communities through collaboration of all concerned partners.”

## LESSONS FROM COMMUNITY BASED FISHERIES MANAGEMENT

Attempts were made during the preparation of the inland capture fisheries sub-strategy to capture lessons related to community based fisheries management from earlier and ongoing development interventions, such as CBFM-2, funded by DFID and implemented by the Department of Fisheries and World Fish Center; MACH project funded by USAID; Fourth Fisheries Project (which ended in 2006) funded by World Bank, DFID and GEF; and Oxbow Lake Project (phase 1 funded by IFAD and phase 2 by Danida).

Other donor funded projects and programmes which have contributed to the lessons are the IFAD funded project working on community management of water bodies in Sunamganj District and the Agriculture Sector Programme Support, Phase 2, sponsored by Denmark, with field components in Patuakhali, and Noakhali and support to institutional strengthening of the Department of Fisheries.

In addition to these there have been projects funded by the Government of Bangladesh, which have addressed issues of community involvement in fisheries management. Among these are the ongoing Creek and Beel Management Project in Western Bangladesh and the Jobai Beel Project Naogaon and Fisheries Management in Water Bodies under the New Fisheries Management Policy (1999 – 2004). International experiences were considered through desk studies and participation in workshops and seminars.

### **Considerations**

These projects have demonstrated the feasibility of community based fisheries management, which gives the users a say in management, gives them direct benefits, leads to improved management and consequently higher production and income for the users. Further, community based management has been effective in addressing habitat destruction, biodiversity and pollution, and ensuring sustainable use of renewable resources.

Thus the feasibility of community based fisheries management has clearly been demonstrated. However, there are issues with long-term sustainability of the community based organisations. They are under constant threats like being captured and/or manipulated by the local elite and they may become dysfunctional because of internal conflict. The projects providing the lessons have recently ended or are about to end and there are few examples of community based organisations continuing their functions without project support.

The strategy identifies a set of crucial issues to achieve the objective of sustainable management. These include a reform of the lease and access systems to promote sustainable management of resources as well as community based management.

Decentralization is a key issue to work effectively with communities and support them to establish their management systems. The strategy advocates the establishment of Upazila Fisheries Committees, which will have a say in resource allocation and the approval of management plans for water bodies and strengthening of the Department of Fisheries to deliver public goods. This will support the engagement and strengthen the role of local government. It also emphasizes technical management through sanctuaries, control of fishing effort, and habitat restoration. Support services like extension and research as well as the need for alternative income generating activities are elaborated in the sub-strategy.

Specifically for community based management the strategy stresses empowerment of fishing communities to take a leading role in management decisions. This will be achieved through an expansion of the number of community based fisheries management organisations, which have been granted long-term access rights to the resource. Through these organisations the users will have legal resource user rights. This in turn demands that the organisations are properly registered either under the provisions of the Social Welfare Department (larger wetland management) or as co-operatives (smaller, well defined, fisher based organisations).

The strategy recognizes that there is a need for flexibility with regard to the organisations and the appropriate type of organization will vary between locations. They may be member based (fishers) or an organization representing different stakeholder groups. A key element is the Upazila Fisheries Committee, which should have powers to administer the fisheries where community based management is feasible. The government will support community based management through different means and Upazila Fisheries Officers should be given training in inland capture fisheries and community management. The role of NGOs in community mobilization is stressed as well as the establishment of linkages and networks between community based fisheries management organisations to have a voice in decision-making.

## INLAND CAPTURE FISHERIES DEVELOPMENT PROGRAMME

The tasks for inland capture fisheries management and development are ambitious. Community based fisheries management needs considerable investment in community mobilization and organization as well as technical management measures. It is however anticipated that the initial high costs should be compensated by lower management costs in the longer term (for example through self-policing of management measures).

The Government of Bangladesh has allocated revenue funding for fisheries management as well as special funding through the Annual Development Fund for projects. While the government's commitment and funding is the backbone for the implementation of the strategy, there is need for additional external funding. The Department of Fisheries is at present (early 2007) preparing a programme for inland capture fisheries development. The programme is based on the priorities in the sub-strategy.



The lessons from interventions show that the issues are multifaceted and complex including the legal framework, institutional development, community mobilizations and technical management measures. The programme takes this into account and proposes a series of interventions, which have been grouped in interdependent and interactive themes or components.

The starting point for the programme is the lesson that the establishment and expansion of community based fisheries is a time consuming process and demands a long term commitment. Sufficient time should be allocated for identification of sites and mobilization of communities before actual interventions can be effective. The programme has therefore been designed for 15 years in three phases.

The overall objective as stated in the draft outline is: *“to ensure sustainable community-led management of inland capture fisheries resources and equitable distribution of benefits”*

There is also the need to address central institutional issues before further expansion of community based fisheries management. These have been outlined above and include:

- the legal framework (discussed in another paper presented at the CBFM-2 conference)
- lease system and access rights to promote sustainable management and empowerment of genuine resource users.
- the establishment of Upazila Fisheries Committees.

The issues differ between different types of water bodies, in particular beels and similar water bodies, where there will be nominal lease fees and priority will be given to community groups, rivers, where there is now open access and a need to establish access control and private floodplains where there is need to ensure sustainable management of the resources.

Programme support for institutional development includes support to networking between existing community based organisations, human resources management and development in the Department of Fisheries and NGOs. The programme outline also recognizes the need for strengthening the Inland Capture Wing and the Planning, Monitoring and Evaluation Unit of the Department of Fisheries.

A key task requiring substantial resources is an inventory of inland capture fisheries resources in Bangladesh. There has been constant destruction of habitat because of natural reasons but also through reduced dry season flow of water from neighbouring countries, the development of infrastructure, agriculture, industry and housing. The status of the resource today is not known and an inventory is essential for planning purposes including the identification of critical areas to maintain fish resources and prevent further decline.

The uncertainties regarding the longer term sustainability of community based organisations were discussed above. There are now some 250 such organisations and a need for consolidation. One theme is monitoring, support and action research related to the organisations and their functions. The research topics may include sustainability factors, equity issues, gender, decision making and conflict resolution and more technical issues like fish stock development, biodiversity, impact of protected areas management, as well as habitat destruction and pollution.

There are some 10,000 to 12,000 jalmohals in Bangladesh, many with good potential for community based fisheries management. At present, as stated above, only some 250 community based fisheries management organisations have been established. A key priority is therefore an expansion of community based management. An ambitious target has been set in the draft programme to reach 2000 community based organisations in 15 years. These will be in major river systems, where the experiences of community management are limited, in major wetlands of national and international importance, and “other water bodies”, which in the context of the project include baors, creeks, and beels (up to 1000 ha).

Fisheries management inevitably means restrictions of access and fishing effort, closed seasons and areas (sanctuaries) and gear control. In the short term poor fishers will suffer during closed seasons and need compensation for loss of income. In the longer term there will often be a need for permanent reduction of fishing effort and thus a reduction of the number of fishers. These impacts of fisheries management measures should also be seen in the light of fish resources often being the last resource for otherwise marginalized poor people. The programme will address the livelihoods of poor fishing communities and the need for alternative income generation activities.

The final component of the programme in its present form is technical management measures. This is intended as a “fund” being accessible by the Upazila Fisheries Committees. The funds should be used for investments in sanctuaries, habitat restoration and other enhancement measures, beyond what is provided during the phase of establishment of community based organisations and the implementation of their initial management plans.

## CONCLUSIONS

The formulation of the Inland Capture Fisheries Sub-strategy, its Action Plan and the drafting of the Programme for Inland Capture Fisheries Development have shown the importance of looking beyond the direct community management issues, with mobilization, organization and training. The legal environment enabling the development of community based fisheries management must be in place and the long term access to the resource by genuine resource users must be ensured. The existing access rights and leasing system are not conducive to community management and proper management of the resource.

Decentralization is a key element in the promotion of community based management to effectively use limited resources. This includes an increased role of the local government as well as the proposed Upazila Fisheries Committees. This will also redefine the role of the Department of Fisheries and demand new approaches and modes of operation to be effective.

There is a danger that an adopted strategy becomes a rigid instrument for development. It is important that the National Fisheries Strategy and in the context of this paper the Inland Capture Fisheries Sub-strategy, are constantly monitored, regularly evaluated, reviewed and revised, and that the learning during implementation is effectively captured. The strategy was adopted in 2006 and is now being implemented. A regular review process should be initiated not later than the second half of 2008 with the aim of having a revised strategy adopted by the end of that year. The process should follow the same pattern as during the preparation of the strategy that is being inclusive, consultative and participatory to capture experiences and lessons gained.

Already at this stage it is probably safe to state that there is one area in which the sub-strategy is weak: gender. The present role of women in the sector and their potential role have not been sufficiently analyzed. This is one area to which the next revision of the strategy should pay attention in order to formulate concrete actions to give full recognition to the role of women in fishing households.

Another area where the strategy needs further elaboration is the human resources development sub-strategy. There are strong arguments to widen the scope to human resources management of which development is only one, but a crucial, part.

The proposed programme is ambitious but will give considerable benefits to the target group. The 2000 community based organisations will allow more than 0.5 million people to be part of the decision-making process on management. The fishing area will cover some 800,000 ha and provide an additional production of 120,000 tonnes per year at an estimated value of US\$ 85 million.

The implementation of the programme depends on lessons learnt from earlier interventions. The implementation mechanisms must be efficient and effective and the approaches and modes of operation rationalized to make best use of all exiting channels and sources of support.


The donor community pays more and more attention to alignment of their support with Government policies, strategies and procedures in line with the Paris Declaration. The National Fisheries Strategy is a clear expression of the Government's priorities and will strengthen the Government of Bangladesh in its negotiations with donors.

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A green rectangular background featuring faint silhouettes of people's profiles and a heart shape, suggesting a community or social theme.

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

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## ABSTRACT

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

## INTRODUCTION

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

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

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

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

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

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

## FISH SUPPLY AND DEMAND IN ASIA

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

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

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

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

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

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

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



## FISHERS AND FISHERIES

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

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

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

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

Source: The WorldFish Center, 2005.

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

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

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

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

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

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

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

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

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

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

## COMMUNITY PARTICIPATION: A BASIC ELEMENT FOR GOOD GOVERNANCE

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

In addition, management is usually accountable to local areas and not to larger regions. Through co-managed arrangements, fishers view it as an incentive to respect and support the rules because they complement cultural values, are self-imposed, and because they are seen as individually and mutually beneficial. Since the community is involved in the formulation and implementation of management measures, a higher degree of acceptability and compliance can be expected (Viswanathan et al. 2003). Community

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

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

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

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

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

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

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

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

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

## SETTING UP LEGAL FRAMEWORKS FOR COMMUNITY BASED MANAGEMENT

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

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

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

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

## CONCLUSION

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

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

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

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

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

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