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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 haor¹ 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

¹ 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 size², (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

² 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.

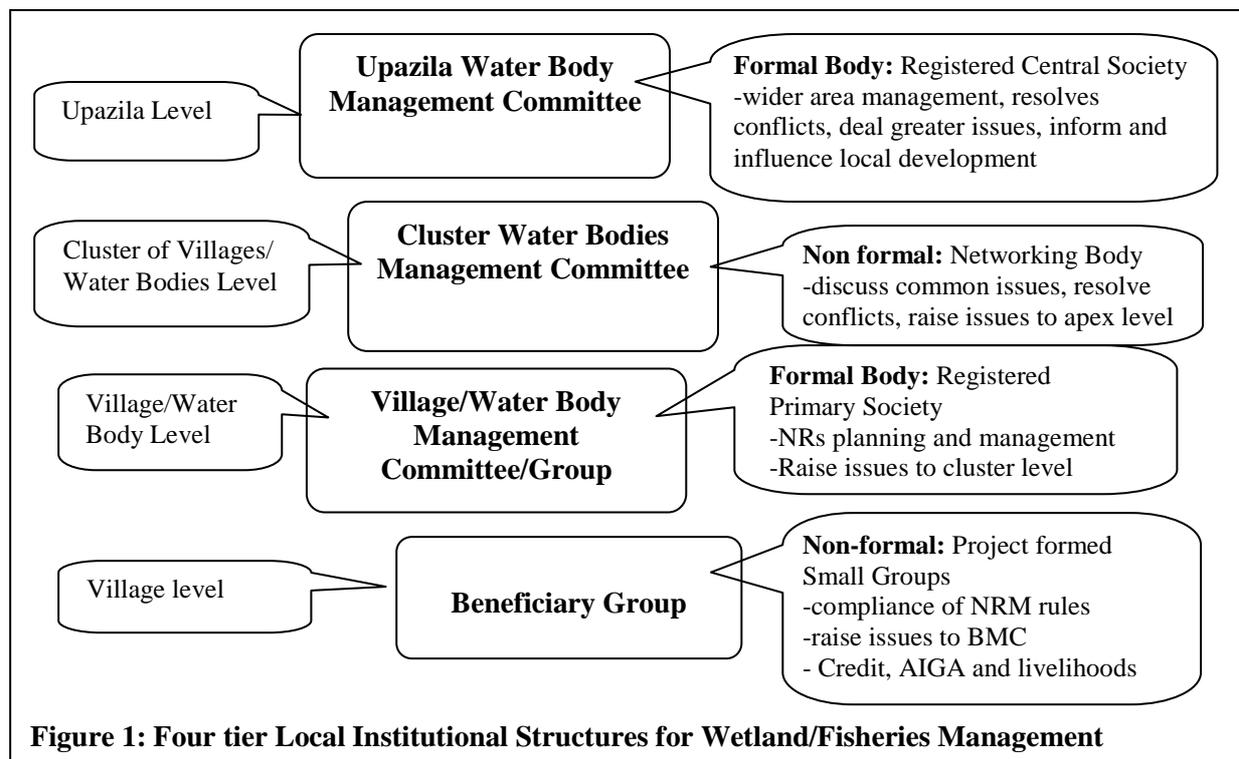
Second Tier: Formal at water body level - is the water body level management committee, either Beel Management Committees (BMCs) or river management committees (RMCs). The BMCs/RMC have been registered under the Cooperative Department as primary cooperative societies, or under the Social Services Department 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 bauth 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 m²) 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 baath 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.