

# Integrated Floodplain Management

## Reintroduction of Locally Lost Fish Species

### How are fish lost locally?

Due to different man made and natural causes wetland habitats are changing. Loss of migratory routs, loss of depth, pollution and fishing pressure etc. are causing the disappearance of fish species locally. At present some species of fish: Meni, Sarpunti, Pabda, Kalibaush, Chital, Ayr etc. are not found in many water bodies of the country, some more are rarely found. Once these fish were found in abundance in those water bodies, but they may still present in other parts of the country.

### What species of fish to be stocked?

Experience suggests that the fish species that depend on zooplankton and other animals for their food are more vulnerable and will be eliminated first. The species are Meni, Ayr, Golsha Tengra, Pabda, Foli, Chital, Sarpunti, Gozar etc. On the other hand, all these fish breed in the floodplains, so these fish can be reintroduced and reestablished even in a closed or semi-closed system. Information is also needed on what species were available, and only those should be stocked if habitat is still suitable for them, sufficient food is available in nature.

### What quantity of fish to be stocked?

Considering all the factors, 1-2 kg of matured fish of each of the selected species can be stocked in the sanctuary per decimal of its area. It is better to stock 2 male per 1 female fish.

### Is restocking required every year?

Experience suggests that if sufficient matured fish are stocked fingerlings of those species will be observed in the following year. This proves that stocked fishes are successfully propagating and are reestablishing, now they needs urgent protection to allow them to reestablish effectively. In this situation, there is no need to stock every year. Again, if fingerlings are stocked instead of matured fishes, they should also be protected to grow bigger and matured to breed. Sanctuaries will be very helpful in helping them to reestablish.

### Where can mature fish be collected?

It is better to collect mature fish from water bodies similar to where the fish will be stocked. This will be good for the transported fish to acclimatize quickly. If sufficient mature fish is not available, fingerlings of the targeted species can also be stocked.

### When is the suitable time to stock?

Mature fish should be stocked at least one month ahead (January-February) of spawning season, so that the introduced fish are acclimatized and can breed in the next breeding season (April-August). Fingerlings can be stocked any time after the monsoon. Whenever is the stocking time, fishers and other people must be motivated not to catch these reintroduced fishes for few years and release them if netted.

### How does it work?

In the Kahetardia Beel in Pakundia under CBFM 2, 51 species of fish were reported during baseline, but local fisher and other people reported once Sarpunti, Pabda, Golsha and Guziar were also available in this beel. Accordingly, in the following year those species were stocked in that beel, after which all the species were able to reestablish themselves.

Encouraging results were found in participatory fisheries or wetland resources management projects through stocking of locally lost fish species. This is now a well-recognized step towards species conservation and increase production.



This fact sheet is prepared based on research findings of various projects aiming at improved floodplain resources management.

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## Restoration of Fish Habitats

### What is the importance of fish habitats?

One of the important causes of decline in species diversity and biological resources in the nature is the reduction or destruction of their habitat. That is why restoration of aquatic habitat is considered, at present, as one of the priority activity.

### What are the reasons for the destruction of fish habitat?

Some important reasons for destruction of aquatic habitats are listed below:

- Siltation of wetlands,
- Conversion of wetlands (agriculture, roads, settlements, markets etc.),
- Dividing wetlands and stopping migratory routes by roads, embankments, sluice gates etc.
- Destruction of forests on the watershed and wetlands,
- Unsustainable cultivation on hill slopes.

### What can be gained through restoration of fish habitats?

Habitat restoration is beneficial for fish in many ways:

- Sufficient water can be ensured for brood fish to survive, allowing reproduction.
- Fishes will be able migrate to their required habitats to breed and grow.

Finally, fish species diversity will be restored and production will be increased.

### What results from habitat restoration?

Increase in species diversity and production observed after reconnecting Shinghargee beel with Dhawleshwary River in Delduar Upazila, Tangail. Production increased to 2.5 ton to 12.2 tons, 46 species increased (due to intrusion of fish from the river) to 63. Though due to less flooding, in the second year production reduced to 8.7 tones, which is still more than 3 times double than previous production. This clearly shows that production can be increased many folds along with increased species if fish migration can be facilitated through re-establishing lost linkages.

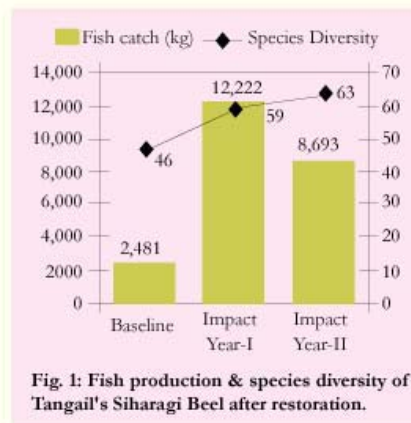


Fig. 1: Fish production & species diversity of Tangail's Siharagi Beel after restoration.



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## Wetland Forest

### What are wetland forests?

Wetlands are fertile and productive resources system. Many aquatic plants grow in wetlands like Hijal, Koroch, Tomal, Barun etc. trees including varieties of reeds and other plants, all these trees and plants together form wetland forests. These plants and trees can survive even if they are submerged for 6 months or more.

### What is the significance of wetland forests?

Wetland forests have multiple effects on aquatic ecosystems to make them resourceful. They work as a shelter for fish and other aquatic animals, in submerged condition algae grows on them, which is a good food for fish. Many fish species use this forest as spawning ground, many birds and other wildlife build nests in it. Many fishing gears cannot be used in these forests, so it is a natural protected area for fish. Wetland forests play a vital role as wave breakers and protect human settlements and other resources. Besides, people regularly harvest fuel wood, thatching and house building materials, tree branches for katha etc.

### What is the present situation of the wetland forests?

Most wetland forests of the Haor region are lost, whilst the rest are under threat. People have destroyed dense wetland forests recklessly for their needs. Still in few places Hijal-Koroch forest is present in very small patches. According to the people in Haor region, less than 5% of the wetland forests exist today. Still tree felling is going on in these forests, if this trend is continued, soon wetland forests will be lost entirely. People will be devoid of much usefulness of these forests. On the other hand, common properties will be occupied by the influential; the wetland environment will be hampered.

### What to do now?

The present situation of the wetland forest is critical, but there is still time. Initiatives should be taken as soon as possible; firstly, a survey should be conducted to see how much forest is left, where, and how they are being managed. On the basis of findings, plans should be prepared to conserve and rejuvenate them. Secondly, through the surveying suitable sites, locations where there once were forests should be identified for forestation, including their ownership status and present use pattern. Thirdly, a massive, participatory forestation program should be undertaken on the identified suitable places



### Who's involvement is necessary in doing this?

The Ministry of Land, District Administration, Upazila Administration, Union Parishad, Forest Department, NGOs and the local people need to come forward and work together in these activities. It will be worthwhile to mention here that CNRS took the first ever initiative of reforestation with Hijal-Koroch trees involving local communities actively. The endeavor was successful.



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## Watershed Management for Wetland Conservation

### What is watershed?

Surrounding hills, land, streams and canals of a wetland from where rainwater flows in, can be termed as the watershed for a water body. Morphology and land type determines the size of watershed.

### Why watershed management is important for wetlands?

Morphology, land type and management of watersheds have an impact on the quality and quantity of the wetland. For example, intensive cultivation in the watershed will cause high erosion, which will enhance the rate of silting. Again, use of agro-chemicals will pollute the aquatic environment, thus harming the life in it. That is why, for a sustainable management of a wetland, its watershed management is inevitable.

Understanding the importance of watershed management in relation to conservation of Hail Haor will further clarify the issue. About 60 streams bring in the rainwater to Hail Haor from its watershed. Hill slopes are intensively cultivated with pineapple and tea in horizontal rows, thus the rainwater washes down the soil to the Haor, silting-up the streams, canals and beels. As a result, many beels dry up or holds low water and impacts the aquatic life is adversely. Besides, agrochemicals coming in are further deteriorating the aquatic environment. Therefore, to ensure a sustainable management of Hail Haor and its resources its watershed management is important.

### What are the main factors for watershed management?

Land use pattern (agriculture, aquaculture, forest cover, industries, settlement etc.) is probably the most important factor in terms of wetland management. All these activities should be done in such a way that does not have any catastrophic affect on the resources and livelihood of the people leaving in the down streams. Some methods for better watershed management are discussed below:

- Forestation on the hills and along the streams: Forest cover on the hills and along the streams will slowdown the water flow thus reduces erosion and landslide are very important for wetlands below.
- Environment friendly cultivation in the hill slopes: Contour plantation on the hill slopes with less tillage will reduce soil erosion and landslides.
- Treatment of pollutants at sources: Pollutants from mill-factories or other sources should be treated at source so that they cannot harm the aquatic habitat and life below.
- Crop diversification and better use of water: Cultivation on the watershed should be well planned. Water hungry crops like boro rice should be replaced by less water demanding crops like wheat, maize, garlic etc.
- Cautionary measures for aquaculture: Alien species of fish should not be cultivated in the ponds in watersheds. Because these fish if escapes and goes to the natural wetlands will harm the local species, even can eliminate local species.



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## Consensus Building in Integrated Floodplain Management through PAPD

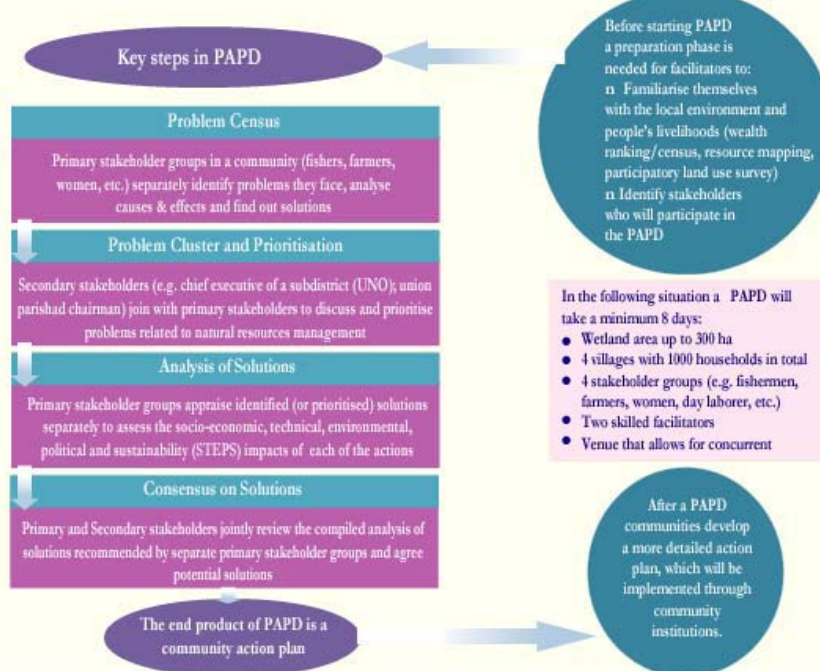
### What is PAPD ?

Participatory Action Plan Development (PAPD) is a method for building consensus among multiple stakeholder groups using different participatory tools on actions those are needed for the sustainable management of natural resources.

PAPD is a dynamic process; there are no immediate solutions. A continuous process of action and reflection is needed to further develop community action plan as livelihoods and the natural resource base changes.

PAPD needs skilled facilitation and a good understanding of the resource systems, local social and institutional functions.

PAPD takes normally 8 days time with 4 skilled facilitator in a situation dealing with 4 to 6 different primary stakeholder groups (e.g. fishers, farmers, landless, women, sharecropper, leaseholders). The exact length of a PAPD depends on the number of stakeholder groups and facilitators.



### How PAPD Benefits a Community?

Participation in a shared learning process, which is not controlled by vocal or socio-politically influential. It is a pro-poor methodology that actively encourages participation of the poorer members of a community.

Facilitating a community to have greater control over the change process and improvement in their community's management and use of natural resources.

Ensuring the agenda for discussion is internally driven and evolves with time rather than being fixed and imposed by external actors.

To know detailed PAPD methodology contact: CNRS or visit website [www.cnrs-bd.org](http://www.cnrs-bd.org)

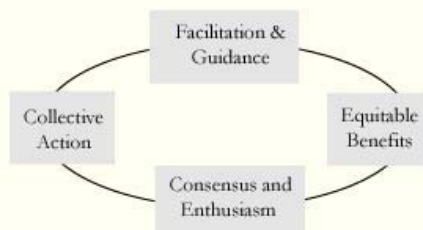


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# Integrated Floodplain Management

## Integrated Floodplain Management: Barriers in Having Better IFM Institutions

Recent Natural Resources Management (NRM) projects have emphasized increased local participation, mainly through Community Based Resource Management Institutions (CB-RMI). Evidence suggests that most of them could not make much progress (have failed) largely on two counts: pro-poor outcomes and sustainability. The process and institutions need to be more inclusive and focus on achieving equitable benefits through collective actions. Read NRSP report on Institution Environment Participatory Method (R8195)



### What are the barriers?

#### Collective Action: Inadequate participation

1. Pre-initiative indifference can be due to lack of clear understanding of project objectives among community members, and through real exclusion of the poor (as in some fisheries projects like 4th Fisheries Project, MACH Project).
2. Post initiative decline in support for institutions can arise if certain stakeholders are disenfranchised or alienated and if the opportunity cost for participation is too high.

#### Facilitation: weak facilitation

1. Declining dialogue and interaction: participation tends to be an early focus (for example as an early stage of the project cycle) but later interaction between primary stakeholders and facilitating/supporting agencies becomes less frequent.
2. Gaps between objectives and understanding: the level of support for new initiatives aimed at benefiting the wider communities for the long term depends on residents clear understanding of project objectives, institutions and activities, but process documentation revealed gaps.
3. Poor linkages and ineffective coordination between government agencies and partner NGOs at national and local levels give rise to conflicts (or confusion) and result in poor participation. Government agencies tend to focus on technical aspects and production, while NGOs are seen as responsible for livelihoods and equity. For example, Local Government has not been formally involved in most project activities, and this is a missed opportunity. MACH experience suggests establishing a strong link with a suitable (or appropriate) local government committee for community-based management of wetland resources produces positive results.
4. Lack of NGO Capacity: poor skills of NGOs and their staff in facilitating local RMIs have failed to maximize participation and develop effective organizations. FFP evidence suggests that smaller NGOs were less effective.

(Continued following fact sheet)



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# Integrated Floodplain Management

Continued

## Integrated Floodplain Management: Barriers in Having Better IFM Institution

### Equitable Outcome: inequitable poverty outcomes

- 1. Resource capture by non-targets:** 'resource capture' by elites and the workings of local power structures can result in benefits being channelled (or siphoned) away from the poor. New opportunities that arise from IFM interventions are most readily accessed by the wealthier who can afford investment in time and money. The problem is more acute where interventions, such as fisheries management are based on subsidy (provision of access rights and inputs) without due concern for mechanisms to assure preferential access to (or by?) the poor.
- 2. Unrestricted access to RMIs:** community organizations open to all create an opportunity for the powerful to join committees, influence decision-making and take control of resources. Approaches that limit elite capture, while including some elites who can help influence opinion positively need to be found.
- 3. Limited understanding of constitutional arrangements:** constitutional arrangements (voting rights, eligibility for different posts, etc.) governing the operation of the RMIs need to be established early or there is space for elite dominance and lack of transparency.
- 4. Influence of pre-existing power structures:** often the distribution of benefits is influenced by pre-existing power structures (e.g. UP Chairman, mosque committee, samaj).
- 5. Unwillingness to challenge local elites:** NGO skills and commitment to helping the rights of poor people, challenge local elites and overcome conflicts cannot be assumed. In general, most projects lack focus (lack of provision) on grass roots advocacy aspect and thus cannot be assumed the RMIs are weak in systematically raising their voices to challenges local elites and other anomalies.
- 6. Fuzzy property rights regimes:** this problem arises when the local reality does not correspond with pre-defined IFM objectives. In some cases this can be incorporated for the benefit of sustainable and equitable IFM, for example local access arrangements are sometimes found to operate on behalf of a broad range of stakeholders which may be equitable by giving seasonal open access to local poor in beels and encourage agreement on and compliance with conservation measures.
- 7. A sectoral focus to IFM** can introduce conflict and polarize the positions of different user groups, for example in some CBFM sites only fishers have been supported when there are multiple stakeholders. Participatory Action Plan Development (PAPD) has been successfully used to develop mutual awareness and consensus between farmers, fishers and other interest groups.
- 8. A structured orientation to NRM:** should move away from a focus on technical service provisions. So far IFM has not empowered the beneficiaries on awareness of rights and entitlements, which would enable them to counteract 'exploitation' or 'exclusion' by powerful interests. Several projects use production increases as their success indicator but the poor may be excluded in the process of raising production.

### Consensus: Lack of Widespread Support

- 1. Intervention induced conflict:** IFM interventions have tended in several cases to alienate some groups, widen differences in interests and create conflicts. This probably relates to the difficulty in achieving collective benefits available to a wide range of stakeholders. Conflict has been less in some sites where PAPD was used.
- 2. Lack of strategic communication and policy influencing:** lesson learning and policy influence have been ad-hoc and unstructured. There was no uptake of research findings and lessons learnt from projects to create widespread support or scale up IFM neither in the policy arena nor for transferring this for new programmes.



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## Challenges In Having Better IFM Institutions

### Collective Action

1. The purpose of IFM institutions must be clearly explained before interventions, and project messages must be easy to understand.
2. Activities and objectives should impact a range of groups in a range of ways so that all stakeholder groups can realize benefits.
3. Cost-effectiveness for participants must be ensured, and the wider community and members of RMI should expect transparency and accountability from their representatives.

### Facilitation

4. Project staff should maintain dialogue and disseminate the project's messages throughout its life span.
5. Cooperation among government agencies and NGOs is crucial. Forging links between RMIs, local government and the local administration is critical for sustainability of RMIs.
6. The experience of involved staff (in GoB and NGOs) to develop and support RMIs should be assessed carefully. Training needs should be assessed at the beginning.
7. Local NGOs should be backed up by close support and mentoring from experienced field based technical assistance staff, or a more experienced NGO team.

### Equitable Outcomes

8. Ensure early inclusive planning and increase staff awareness of power issues.
9. Avoid strongly subsidized inputs for production and access rights; instead start with low cost smaller actions.
10. Formalizing (registration with social services or cooperative) RMIs can help improve the prospects of sustainability but is not sufficient to ensure appropriate institutions.
11. The needs and proper representation of fishers/resource users should be incorporated in all IFM projects.
12. A full understanding of the role of the key informal institutions should be achieved prior to any intervention.
13. Inclusive and participatory decision making (PAPD) can provide a role for the elite in supporting IFM initiatives.
14. Facilitators need to adapt to existing local access arrangements and fully understand them in relation to the livelihoods of the poor, particularly the opportunities they provide at certain times of the year.
15. Some form of social reconnaissance should attempt to map informal NRM mechanisms.
16. By adopting a more integrated approach including different livelihoods groups, new IFM can build relationships and linkage among those groups.
17. Project design should incorporate elements of empowerment and awareness of rights and entitlements.

### Consensus

18. A process approach can build capacity through flexibility and adaptability of project activities.
19. Implementing agencies should be aware of the bottlenecks that tend to appear and of strategies to avoid them.
20. Dispute or conflict resolution should be seen as an integral part of RMIs.
21. The capacity of each project to consider these issues is limited. National policies are starting to stress cross-sectoral links, with calls for integration at ministerial level.
22. A structured approach to communication for policy influence should be incorporated in new IFM initiatives.
23. Because floodplain management performance (outcomes and impacts) relate very closely to approach and objective, IFM agencies should carefully consider their future role and approach in the light of lessons learnt from past experience.



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