

Node: Suite Summary^{1,2}

Bangladesh: Integrated floodplain management

Context

Floodplains are complex resource systems that provide diverse products and services that have been utilised by rural communities for generations. In the floodplains of Bangladesh, systems of embankments and sluice gates have been erected in an attempt to control the floods. These hydrological modifications have impacted on natural resources including fish, and upon livelihood strategies adapted to the flood cycle. The recent ability to manage water movement through sluice gates has resulted in conflicting demands on water use for agriculture and for fisheries, and questions over the equity of distribution of benefits.

Floodplain systems have particularly complex bio-physical, socio-economic, institutional, cultural and political dimensions, but development interventions have frequently failed to account for this complexity. An understanding of the interactions of these dimensions was needed in order to adopt a systems based and integrated approach to improving the management of multiple-use floodplain resources.

This Suite of projects sought to address this need by: understanding floodplain related livelihoods and water management strategies; exploring and testing integrated approaches to optimising use of water for fisheries and agriculture; and exploring the institutional arrangements necessary to support pro-poor 'integrated floodplain management' (IFM) that can deliver benefits equitably. It targeted diverse stakeholders from the policy level through intermediary organisations to the community level. The work resulted in the findings from projects conducted under the NRSP 'Land Water Interface' and 'High Potential Systems' production systems being amalgamated with those from projects of the Fisheries Management Science Programme (FMSP). A collective approach to uptake promotion of these findings was adopted.

Research Topics

- What are the impacts of competing production systems in modified floodplains on livelihoods based on fisheries, agriculture and other floodplain resources? What are the environmental impacts?
- What optimum use strategies for IFM can be defined that will result in equitable distribution of benefits, including to the poor?
- What are the institutional arrangements that can support poverty-focused IFM?

Projects

Project R6756 (see project links below) sought to address the knowledge gap in understanding the complexity of floodplain based livelihoods, the competing demands for water between agriculture and fisheries and the livelihood strategies, particularly of the poor,

¹ This document summarises NRSP's work in one of its Uptake Promotion Node: suites. For further details and links to project and project documents see <http://www.nrsp.org.uk/6.aspx>

² This document presents research funded by the UK Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID.

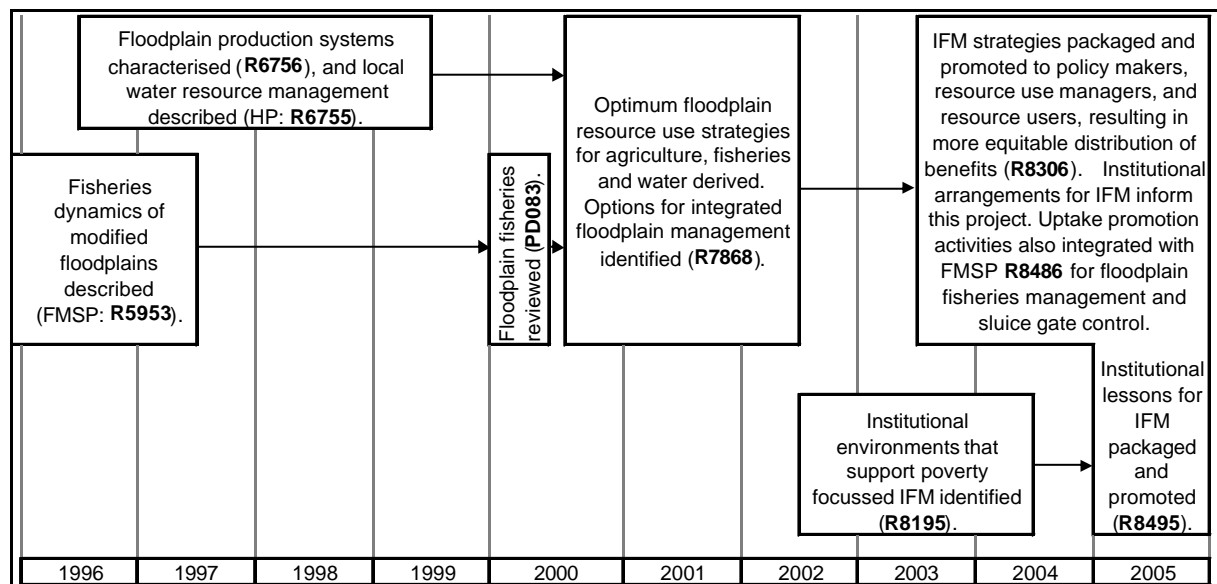
that have developed around the flood cycle: while R6755 looked specifically at water management issues. Complementary work conducted through the FMSP (R5953) looked at particular issues related to fisheries, and the use of sluice gate management controls to benefit both fisheries and agriculture. PD083 provided a review of floodplain fisheries.

NRSP project R7868 built on this work, using modelling to examine alternative IFM strategies. Social, economic and livelihood impacts of the strategies were assessed in order to explore the distribution of benefits amongst farmers, fishers and landless poor who depend on the floodplains.

Many formal and informal management institutions exist that may impact on IFM. To better understand their institutional dynamics and to explore the best way to promote improved IFM, project R8195 studied the institutional factors underlying successful poverty focussed implementation of IFM plans and initiatives.

Using the findings of R7868 and R8195, uptake promotion projects R8306 and R8495 aimed to test the adoption of improved IFM strategies and the institutional arrangements that support them and to promote relevant messages to stakeholders at all levels through a collective uptake promotion and communications strategy. The focus of R8306 was on adoption of options at two field sites (a seasonal floodplain in Narail district and a perennial *beel* [permanent water body] with seasonal floodplain in Tangail district) that reduced dry season water demand and thereby improved fish survival and growth. Project R8495 promoted recommendations on appropriate institutional arrangements that support poverty-focused IFM interventions.

Project links within Caribbean Suite 3: 1996 - 2005



Outputs

Findings

Management of water levels was the most commonly perceived problem at floodplain sites (R6755). The goals of water management varied between socio-economic and occupational groups, requiring an integrated approach to management and assessment of altered flooding

regimes and their ecological and social impacts. A focus on agricultural production was found to have significant negative impacts on fisheries production, upon which the poor depend.

R7868 developed six alternative IFM strategies, and indicated that limiting the rabi (dry-season) rice area in low and very low lying land was the key to improved IFM at the study location. Significant livelihood benefits could be achieved from relatively small sacrifices and modifications to water management protocols. For example, in a 6773 hectare site, reducing the amount of land planted to rabi rice by 16 hectares resulted in a 20% higher fish catch that benefited the entire spectrum of floodplain poor. Gains from fish catches exceeded agricultural losses 34-fold.

Adaptive testing of IFM strategies (R8306) highlighted some of the socio-political complexities of implementing improved management. Sluice gate management was important in deciding strategies for dry season rice and alternative crops, but those who decided crop selection (and influenced water management regimes) were often absent landowners rather than poor sharecroppers. Other influential stakeholders were operators of low lift pumps and shallow tube wells who were confused as to the extent they may benefit from watering and so were resistant to change. Market prices for alternative crops also affected crop selection (and thus water management protocols). These factors influencing change must be addressed if the poorest sectors of society are to benefit. However, this research demonstrated that this is feasible, and has generated significant interest in IFM approaches beyond the project sites. A collective participatory approach is required, sharing common issues amongst the different groups involved, both formally and informally, to achieve IFM success.

The two years of piloting indicated that the alternative IFM options used could produce measurable positive change in floodplains and the communities that use them. In Tangail, testing of alternative crops increased from three farmers and 3 acres in the first year, to 85 farmers and 42 acres in the second year, with very little project support. In Narail, 46 farmers cultivated six alternative rabi crops on 26 ha through voluntary adoption. At both sites, participating farmers received substantially improved returns compared to boro (a variety of rice harvested in April) and fish production and species diversity increased. Environmental pollution was decreased through the introduction of alternative jute retting techniques.

Influencing the floodplain management policy process in Bangladesh requires powerful and sustained effort. Experience from R8306 indicated that creating change may be easier by working at the community level, developing and organising a local IFM committee and testing a new IFM technology with the whole community. The communities at the pilot sites became pro-active and the positive results convinced field level officials of government line agencies (e.g. Department of Fisheries (DoF), Bangladesh Rice Research Institute (BRRI), Department of Agriculture Extension (DAE)) to assist in creating an enabling situation for IFM strategies.

R8306 identified success factors for further promotion of IFM including:

- Focusing on whole communities, not only fishers or farmers.
- Creating awareness of the variety of food crops that are alternatives to rice production.
- Micro level planning to cater for variations in land elevation, flooding regimes and thus IFM strategies.

- Recognising that water management is central and adopting a holistic systems approach that focuses on balanced use of water for fish and crops.

R8195 identified institutional barriers to improved and integrated IFM, and institutional arrangements that support it:

- Key players for national scaling-up of pro-poor IFM operate at the meso- to local- but not macro-level.
 - The NGO sector is likely to continue its important activities at grass roots level but there is a need for increased vertical linkages and partnerships with government and the private sector in order to strengthen the institutional arrangements required for improved IFM, as established in projects.
 - For community based Resource Management Organisations (e.g. IFM Committees) to play an effective role in fisheries management, careful and early planning of their capacity development is essential with wide stakeholder involvement.
- Currently, NGO support to communities tends to be withdrawn together with project staff post-project. Government of Bangladesh agencies have a poor record and few resources with which to continue technical and capacity building support to the communities and their organisations.
- National Bangladesh government structures and the civil service have been slow to change (e.g. in support of devolution of power). In order to develop capacity for responsive interventions, local government institutions are likely to require additional authority and fiscal responsibility.

Research messages

- A multi-disciplinary and integrated approach to the assessment of floodplain dependent livelihoods is required in order to produce practical advice on integrated management approaches and alternative flooding regimes.
- Limiting the rabi rice area in low and very low lying land is the key to improved IFM in Bangladesh. Significant pro-poor livelihood benefits can be achieved by small area reductions and modified water management.
- IFM is more complex than models suggest. To enable increased benefits to the poor, stakeholders who influence the cropping pattern and watering arrangements must be encouraged to change their practices, through community planning with all stakeholders, including the elite.
- An holistic systems approach to IFM is achievable using an effective communication strategy that engages relevant stakeholders in a participatory process of sharing issues. This can deliver measurable environmental and livelihood benefits to farmers and fishers (outlined above), including the poor.
- Community based organisations (CBO) can be the drivers of change for IFM, but not alone. Institutional and policy arrangements at all levels need to be understood and addressed in order to achieve sustainable IFM.
- Social changes must be instigated to strengthen local institutions for IFM. The changes include participatory approaches generating consensus and enthusiasm within the community for adoption of IFM; autonomous management; and mechanisms for equitable distribution of benefits.

Key research products

- Final Technical Report for R6756 including agro-ecosystem maps and a GIS database describing resource use patterns at two floodplain sites in Bangladesh and a conceptual model of floodplain production systems.
- A problem census and systems based workshop process, subsequently developed into Participatory Action Plan Development (PAPD Suite 1: Final Technical Reports R7562 and R8223).
- Maximisation of joint benefits from multiple resource use in Bangladeshi floodplains - a final project report detailing alternative floodplain management strategies.
- A communication resource pack comprising 'IFM', 'CBO' and 'Institutional arrangements' products. These include training materials, policy briefs, videos, methods for participatory monitoring, and other communication materials.

Impacts

Local project level:

- Use of alternative IFM options led to poor fishers and farmers deriving more benefits from use of floodplain resources.
- Fish production, size and diversity increased at study sites.
- Better water management resulted in improved habitats for fish and other aquatic flora and fauna.
- Introduction of improved jute retting techniques increased water quality and reduced pollution.
- Farmers adopted IFM options, e.g. Eighty-five farmers at Narail site and 87 at Charan Beel increased the area given to production of rabi crops by 25-fold over two years, resulting in increased household incomes.
- Fisher and farmer committees were formed through the project to address the water management issues raised.
- Increased co-ordination among local institutions was reported in project monitoring, and IFM committees are in the process of registering as a legal entity.

National level:

- The Department of Agricultural Extension, Bangladesh Rice Research Institute (BRRI) and Bangladesh Agriculture Research Institute (BARI) agreed to further test and develop IFM options.
- Lessons from IFM were incorporated in a draft Bangladesh national open water fisheries management strategy.
- The Department of Fisheries (DoF) included IFM in its training modules and, as of March 2006 281 DoF and partner NGO field staff had been trained in improved IFM strategies.
- DoF recognised institutional barriers to IFM and agreed to address them in future projects. High-level DoF-organised workshops included presentation and discussion of IFM options. At the time of writing (March 2006), DoF was planning to support new IFM institutions throughout the country for five years, including fisheries Management Committees formed under the fourth fisheries Project.

Non-project sites:

- Livelihood empowerment and agro-forestry (LEAF), Management of Aquatic Resources through Community Husbandry (MACH) and CBFM2 projects have all implemented IFM options and conducted field trials.
- Visiting farmers and CBOs from non-study sites adopted IFM options such as cropping pattern changes.
- Bangladesh Water Development Board (BWDB) incorporated IFM options into their activities.

Further work

IFM requires coherent policies that cross cut established sectors (such as agriculture, water management, fisheries) and integrated actions amongst stakeholders at all levels. NRSP research has created positive attitudes to IFM but in order to maintain the momentum and achieve widespread benefits, support is needed to mainstream IFM with particular emphasis on programme and policy levels. Linked to this is a need for improved coordination and joint action by the Department of Fisheries, other government departments and non-governmental organisations in order to enhance IFM practice nationally. Constraints for joint action by these agencies need to be researched and addressed.

The development of targeted training materials and programmes is a further requirement for improved IFM practice. In particular, work is needed to strengthen communications skills amongst implementing target institutions for more effective uptake promotion of research findings.

Cropping pattern change is an important and effective option for IFM but additional work is needed to promote this option nationally through testing at different scales (e.g. micro catchment to eco-regions).