NATURAL RESOURCES SYSTEMS PROGRAMME

FINAL TECHNICAL REPORT[1]

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R8306

Project Title

Better options for integrated floodplain management – uptake promotion

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NRSP Production System

LWI

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Contents

Abbreviations and Acronyms

AFO : Assistant Fisheries Officer
BARI : Bangladesh Agriculture Research Institute
BELA : Bangladesh Environmental Lawyers Association
BMC : *Beel* Management Committee
BRRI : Bangladesh Rice Research Institute
BS : Banchte Shekha (a national NGO, implementing partner of CBFM 2 project)
BWDB : Bangladesh Water Development Board
CBFM : Community-Based Fisheries Management
CBO : Community-Based Organization
CNAS : Communication Needs Assessment Survey
CPUE : Catch Per Unit Effort
DAE : Department Of Agriculture Extension
DoF: : Department Of Fisheries
FFP : Fourth Fisheries Project of DoF
FFS : Farmers Field School
GOLDA : Greater Option for Local Development through Aquaculture
HYV : High Yielding Variety
IC : Inter Cooperation (an international NGO working in Bangladesh)
IFM : Integrated Floodplain Management
LEAF : Livelihood Empowerment and Agro-Forestry
LGED : Local Government Engineering Department
LGI : Local Government Institution
LLP : Low Lift Pump (Motorized Pump For Surface Water Extraction)
LWI : Land-Water Interface
MACH : Management of Aquatic Resources through Community Husbandry
MoEF : Ministry of Environment and Forest
MoFL : Ministry of Fisheries and Livestock
MoL : Ministry of Land
MoU : Memorandum of Understanding
PAPD : Participatory Action Plan Development
PNGO : Partner/Participating Non-Government Organization
PWD : Public Works Department
SEMP : Sustainable Environment Management Program
SIPP : Social Investment Programme Project

SSWRDP	:	Small Scale Water Resource Development Project
STW	:	Shallow Tube-Well (Motorized Pump For Ground Water Extraction)
TA	:	Target Audience
TI	:	Target Institution
TK/tk/t	:	Taka (Bangladesh currency)
(S)UFO	:	(Senior) Upazila Fisheries Officer
UP	:	Union Parishad (Local Government Body)
WARPO	:	Water Resource Planning Organization
WFC	:	WorldFish Center

Local terms

Aman	:	A variety of rice harvested in November (after recession of floodwater).
Aus	:	Monsoon rice
Beel	:	Deeper portion in a low-lying depression / floodplain - usually retains some water throughout the year.
Ber Jaal	:	Seine net (usually fine mesh sized), harmful fishing gear
Boro	:	A variety of rice harvested in April / May (before inundation of floodwater).
Current *Jaal*	:	Monofilament gill net (harmful but popular fishing gear)
Gher	:	Water-body used mainly for shrimp culture.
Haor	:	Large low-lying natural depression that remains submerged for 6-7 months of the year - may contain several *beels* (term used in the northeast part of the country). Single cropped area suitable for *boro* rice.
Jalmahal	:	A *beel,* river section, *khal,* or other water-body, which is registered for revenue collection purposes as a fishery.
Katha	:	Brush pile constructed to attract fish.
Khal	:	Drainage channel running across a *haor* or floodplain, connecting a *beel* to a river.
Kharif-1	:	Summer crop growing season, *Falgun* (February / March) to *Ashar* (June / July)
Kharif-2	:	Monsoon crop growing season, End of *Ashar* (July) to *Kartik* (October / November)
Kua	:	A ditch or pond dug in a floodplain to concentrate fish as the water level falls.
Rabi	:	Cropping season during winter (peak dry season), suitable for growing a variety of crops including *boro* rice, vegetables, wheat, maize, garlic, onion, oil seeds, and pulses.
Samaj	:	An informal but pervasive local institution – a type of "brotherhood" that exerts power and influence by emphasising social and religious duty.
Samity	:	Association or group (micro credit group)
Upazila	:	An administrative level between the district and union levels containing an average of 7 Union Parishads (council).

1 Executive Summary

Bangladesh Government policies regarding wetland resources still generally ignore sustainability aspects and access for the poor. Conflicts between farmers and fishers (in other words rice vs. fish) relating to the use of dry season water are a common feature in most floodplain basins. The farmers, who are generally wealthier and more influential, often win, whilst the poor and landless, who make a substantial part of their livelihood from floodplain resources, lose. A recently completed NRSP project (R7868) suggested an Integrated Floodplain Management (IFM) approach focused on minimising resource use conflicts between fishers and farmers through integrated management interventions. This could maximise floodplain production whilst simultaneously benefiting the poorer members of the communities. The IFM options were expected to create an opportunity to build consensus among the various users of floodplain resources to protect and enhance the open capture fisheries, upon which the poor are most dependent. Farmers could also potentially gain through adopting alternative crop management practices that are fish friendly.

This project was aimed at testing the computer-based IFM model in a field situation, and at communicating findings to key relevant audiences to promote uptake. The IFM options were tested in two sites: a seasonal floodplain in the Narail district and a perennial beel with a seasonal floodplain in the Tangail district. At both sites, improved fisheries management has been in place under CBFM-2 for several years and thus substantial time-series data and information was available. The link with CBFM-2 was planned, to help uptake promotion and circumvent the development of fisheries institutions. Data was expected to help in testing the models. The focus in piloting was therefore adoption of options that reduced dry season water demand, thereby improving fish survival rates and growth. The indications from 2 years of piloting are that the options (cropping pattern change and fishing effort control) can produce positive changes both in floodplains, and in the communities that use them. In the Charan site, Tangail, three farmers over 3 acres of land tried alternative crops in the first year. By the second year, the number of farmers and land had increased to 85 and 42 acres respectively, with very little project support. At the Narail site, 46 farmers cultivated six alternative *rabi* crops on 26 ha of land, as piloting moved into voluntary adoption. At both sites, participating farmers received very good returns compared to *boro rice,* while fish production and species diversity in both areas increased. Other options addressed included coordination of sluice operation, and perceived water quality problems, through alternative jute retting methods.

A communication strategy and plan were developed based on a communication need assessment survey. Various media have been developed (TV spots, training modules, folk dramas, policy briefs, posters, fact sheets, and billboards) and used to reach stakeholders at micro, meso, and macro levels. As a result TIs have started testing IFM options in a number of areas, the national inland fisheries strategy has incorporated IFM options, BRRI is testing deep water *aman*, BWDB facilitated sluice gate operation, and DAE trained farmers on improved jute retting techniques through partnership arrangements.

Local level institutions were formed under the project with relevant stakeholders. One focus in piloting was to develop learning committees of farmers, and in Narail, creating linkages between various existing local institutions under the umbrella of IFM. A series of workshops and meetings were organized and the learning from piloting was documented. The project introduced participatory process monitoring, and community capacity improved as a result. IFM committees[2] internalized the learning and are moving towards sustainability.

[2] IFM Committee is a CBO that has been set up during R8306.

2 Background

Bangladesh has a population of 140 million and a GNP per capita (1999) of $370. Over 50% of the population are poor (36% are 'extremely poor'). Approximately 25% of the population consume less than 1,800 kcal per person per day[1] (BBS 2003). Agriculture contributes 50% to rural livelihoods, and whilst fishing accounts for a mere 3% of GDP, it contributes to the livelihoods of over 73% of rural floodplain households (Shankar, B. *et al*, 2004). Access to aquatic resources, particularly for the poor, is becoming increasingly difficult. Bangladesh consists of 80% floodplains of the Ganges, the Brahmaputra, and the Meghna (Shankar, B. *et al*, 2004). Wetlands in Bangladesh have traditionally provided food and livelihood security (agriculture, fish and other aquatic resources) for millions of rural people: landed elites, farmers, fishers, landless labourers and poor women. Aquatic products are a major source of essential nutrients in both rural and urban households (Muir, J. (ed.), 2003). However, the landed elite have long dominated control over wetlands, whereas the opinions and livelihoods of poor fishers and the landless are seldom valued in management decisions (CARE Bangladesh, 2005).

Bangladesh government policies on wetlands still generally ignore access for the poor and sustainability. Technical and administrative interventions by the government and private investors primarily focused on irrigation, drainage, and flood control for agriculture (particularly rice). This benefited farmers, and to some extent wage labourers, but drainage, flood control, and irrigation have adversely affected floodplain fisheries, which have been estimated to have fallen by almost 70% in recent years. Participatory assessments indicate that pressure on fisheries and other aquatic resources has grown rapidly, and availability per household has fallen. This affects 1.2 million professional fishers (one of the poorest groups in rural society), and the poor in general, who rely on these resources as a subsistence safety net (Huda, A.T.M.S., 2003).

A recently completed NRSP/LWI research project R7868 undertook modelling exercises, based on which recommendations on IFM strategies were made. However, these were not tested. Many recommendations from R7868, including dry season refuges for fish, closed seasons in the early monsoon, and modified sluice gate operation have previously been identified by communities during participatory action plan development (PAPD) (R7562, CBFM-2, MACH). Indeed, communities under CBFM-1 and CBFM-2, MACH, and SEMP projects are already implementing such measures.

In April 1999, NRSP recognised that research that aims for nearer term developmental uptake and livelihoods impact must give due attention to the integration of uptake promotion into research design with an emphasis on communication planning. Influencing national developmental policy requires targeting those people (rather than institutions) that are in a position to influence policies relating to IFM, and consequently improves the livelihoods of those in floodplain areas. It has been found that policy advocacy should be based on evidence of a need for change, together with sufficient knowledge of current practices, regulations and laws affecting floodplain management and peoples' livelihood options; in short, knowledge that has been generated by LWI partners and other projects (e.g. CBFM). A recently completed NRSP project on institutions, R8195, is particularly relevant as it assessed institutional barriers to uptake of pro-poor management strategies, whilst R8223 investigated communications media for better targeting of key people in these institutions. The evidence

[3] This is the minimum set by the World Food Programme for the purpose of in-country monitoring.

from R7600 is also pertinent as it indicated that insufficient interaction between service providers and farmers, and inadequate information, were the key problems, rather than availability of technologies. R8083 investigated knowledge and information systems that meet the needs of farmers. The experiences from these four projects have been invaluable in defining and implementing a suitable communications strategy.

Ideally, advocacy needs a strong 'driver' to sustain development of any given component. Strategic relationships need to be built with those who have the capacity to influence policy. By project design, CBFM-2 and MACH have been working to influence and advocate inland fisheries policy change, and continued promotional activities into 2006; thus, the project used these projects as vehicles for communication.

This research was built on the different strands of floodplain related programmes in Bangladesh, including action research in improved participatory management of inland fisheries (CBFM-2, MACH), policy influence (Wetland Network, MACH, CBFM-2, Fourth Fisheries), and process change in the fisheries sector (sector review).

Policy changes and local initiatives in fisheries and floodplain management take time, and since CBFM-2 has a central role in testing improved inland fisheries management at the local level, as well as in changing policy processes for inland fisheries, it was thought logical to link the complementary aspects of these processes with work carried out under R8306. The recommendations from R7868 are consistent with pro-poor participatory fisheries management. Participatory planning for floodplains was adopted as an entry point, encompassing all aspects of livelihoods.

3 Project Purpose

The purpose of the project was to develop an implementation methodology for wider practice of integrated floodplain management (IFM) options in a diverse range of floodplain environments in Bangladesh, to be achieved through adaptive testing of improved IFM options with the participation of user communities and related stakeholders. In addition, the promotion improved IFM options to key decision makers and organisations that are influential in maximising joint benefits from floodplains, especially those who target the millions of rural poor in Bangladesh, was intended.

A recently completed NRSP LWI project (R7868) developed IFM options aimed at maximising joint benefits (rice and fish) from floodplain resources. R7868 used secondary data from previous LWI research to develop a computer-based model. However, the model demanded adaptive testing to verify the operational suitability and social acceptability of the options at the community, and other stakeholder, levels.

Conflicts between the farmers and fishers (i.e. rice vs. fish) relating to use of dry season water are a common feature in the majority of the 5.5 million hectares of floodplain land (Draft Inland Capture Fishery Strategy, 2004). The preferences of the farmers, who are wealthier and more influential generally prevail, whilst the poor and landless, who receive a substantial part of their livelihood from floodplain resources, lose out. The suggested approach focused effort towards minimising resource use conflicts between fishers and farmers through integrated management interventions. These initiatives could maximise floodplain production whilst at the same time benefiting the poorer members of the communities. It was assumed that in the course of piloting the IFM options, the opportunity would be created to build consensus among the various floodplain resources users to protect and enhance the open capture fisheries, upon which the poor are most dependent. Farmers are also potential beneficiaries if they adopt alternative crop management practices that are fish

friendly. Much research has been carried out in Bangladesh targeting poverty reduction and improved natural resource management in floodplain ecosystems (e.g. FAP studies – FAP 16-Environmental study, FAP 17-Fisheries Study), but the majority of research results are not effectively communicated to the relevant agents and stakeholders. In most cases, research recommendations are presented at an end-of-project workshop to a select group of stakeholders who may not be in a position to act on the recommendations. There are, however, some successes in the uptake and use of some research outputs, possible only due to the commitment of key individuals and partners organisations (for example, the use and promotion of PAPD has extended well beyond the life of the initial research project (NRSP - R6756, R7562, R8223 and NRSP - PD131[4])). It was found that substantial work is needed to ensure the technical viability and social acceptance of an intervention at all user levels (communities, intermediaries, and policy stakeholders) to assure successful implementation.

One of the project aims was to generate information and draw examples from the actual experiences of participants, to illustrate the impact of IFM on user communities (particularly on the poor / very poor). Through this, it was hoped that key policy stakeholders and practitioners could be motivated to changing their views and approaches to floodplain management.

4 Outputs

The project as defined in the logical framework, aimed to achieve the following three outputs:

Output 1:	Improved IFM options successfully piloted in different environments.
Output 2:	Tools for effectively communicating IFM recommendations and methods/options to reach target audiences (including policymakers, intermediaries, and community practitioners) developed.
Output 3:	Institutional learning systems in relation to IFM assessed.

Output 1: Piloting IFM options

This output has been achieved in full through successful piloting of the IFM options in two sites located in two different geographical locations of the country. The Charan *Beel* site, located in Pungli-Bongsi Rivers' floodplains in the north central region is a perennial water-body while the Goakhola-Hatiara floodplain, located in the south-west of the country, is a seasonal water-body with canals which retain water throughout the dry season. The piloting activities, including monitoring and assessment of learning, were initiated in July 2003 and continued up to September 2005 in Goakhaola-Hatiara site. Field activities at Charan *Beel* continued until the harvesting of deepwater *aman* rice (trialled jointly with BRRI) and ended in late November 2005.

The project ensured participation of different stakeholders groups, owner farmers, sharecroppers, fishers and women in piloting and promotion of IFM options (fishing effort control, cropping pattern management, water/sluice gate management) (Text box 1). Besides this, the project also involved a range of secondary stakeholders (DoF, DAE, BADC, BRRI, BWDB and UP, and NGOs) in planning, implementation, and assessment of learning.

[4] R6756-Resource use pattern in floodplain production system, R7562-Consensus Building, R8223-Participatory action plan development.

(Annex-B1 and B2).

The IFM options tested were i). Fishing effort control, ii). Cropping pattern management, iii). Sluice gate management and iv). Land retirement. In the project sites, the ongoing CBFM-2 project managed fishing effort control aspects of IFM, as managed by the BMC[5]s (fisher CBOs formed under CBFM 2 project) of the respective sites. An additional benefit of the projects being implemented at existing CBFM-2 sites was that a vast amount of data (5 years fish catch monitoring) was already available for use and comparative analysis.

IFM options tested in two pilot sites

IFM Options	Tested in
1. Cropping pattern management	Both the sites
2. Fishing effort control	Both the sites
3. Sluice gate management	Goakhola-Hatiara site
4. Land retirement	Farmers are unwilling but indirectly achieved through cropping pattern management at Charan site

Text box 1: Stakeholders participation in IFM promotion work

Stakeholders	Participation and activities
Fishers	Plan and practice fishing effort control and habitat restoration activities; practice cropping pattern as farmers; take part in reflective learning, process monitoring using report card through BMC[2]
Farmers	Plan and practice cropping pattern, water and sluice gate management activities; practice fishing effort control as fishers; support fishing effort control and restoration activities along with others; reflective learning and process monitoring using report card through IFM committees
Sharecroppers	Plan and practice cropping pattern, water/sluice gate management and also fishing effort control as fishers; take part in reflective learning, process monitoring using report card through IFM committee[3]
Women	*General IFM focus*– planning and support BMCs and IFM committees in IFM actions and participation in *rabi* vegetable gardening, jute retting, water pollution and fishing effort control
All primary stakeholders	Through BMCs and IFM committees sharing common issues around IFM and livelihoods *among* them and maintaining linkages with secondary stakeholders including project team
DoF	Support communities on fishing effort control measures, administrative support on various issues, negotiating issues with DAE and BWDB and other upazila and district officials on IFM, training
DAE	Support cropping pattern activities, adopting new technology/varieties, administrative support on various issues, negotiating issues with BWDB, and other upazila and district officials on IFM
BRRI/BARI	Support trial and training on deepwater *aman* rice cultivation as monsoon crop. Supply quality seeds and resource materials
BADC	Supply of quality seeds to the participating farmers
Jute Department	Training on improved jute retting techniques, negotiating issues with BWDB and other upazila and district officials on IFM

[5] BMC is a CBO that CBFM 2 set up.

[6] The BMC (Beel Management Committee) is a CBO set up under the CBFM-2 project in order to manage interventions made through CBFM, with members being drawn from poor fishing communities.

[7] The IFM committee is a CBO set up under R8306 in order to coordinate farmers and as a knowledge sharing / dissemination forum for farmers involved in alternative rabi crop piloting.

Cropping pattern management option

Despite understanding the benefits in theory and observation in practice (year-1 and 2), uptake of alternative *rabi* crops by farmers has been slow. In general, the farmers' primary choice is rice , to ensure food security. Rice is the staple food for Bangladeshi people and farmers are confident in rice cultivation through skills acquired over many years of practice. Although price falls during the harvesting period, local demand for rice is always very high. However, entrepreneurial farmers emerged in both the sites and selected 6 new crops (potato, wheat, maize, garlic, sesame, *ratul* – a water tolerant *aus* rice variety) out of around 20 varieties field-tested in year-1, to pilot in year-2 (Annex A Section 6 and Annexes B1 and B2).

In the Goakhola-Hatiara site, the major change in cropping pattern was a reduction in *boro* cultivation (combining local and HYVs), and more land switched to growing local *aus* after HYV *boro* or *khesari* (Fig. 1). According to the farmers, in the last 20 years, they were never able to harvest *aus* properly and because of this, were reluctant to invest in cultivating monsoon crops. In 2004, the IFM committee planned and excavated a small canal, and built a flap gate sluice with support from the local community and project people, facilitating the cultivation of *aus* paddy.

In 2005, farmers adopted a new short duration paddy for which the project both initiated the idea and helped with the technical assistance and linkages to the DAE. This short duration crop has enabled farmers to grow another early crop such as mustard. However, cultivation of *aman* paddy has reduced drastically in the last three years. The reason is that the variety of *aman* usually cultivated by the local farmers needs almost six months to grow and they do not have enough time to cultivate *boro* paddy after *aman*. Instead of an *aus* paddy variety, '*ratul*', resistant to high water levels, and with a good yield, has been adopted.

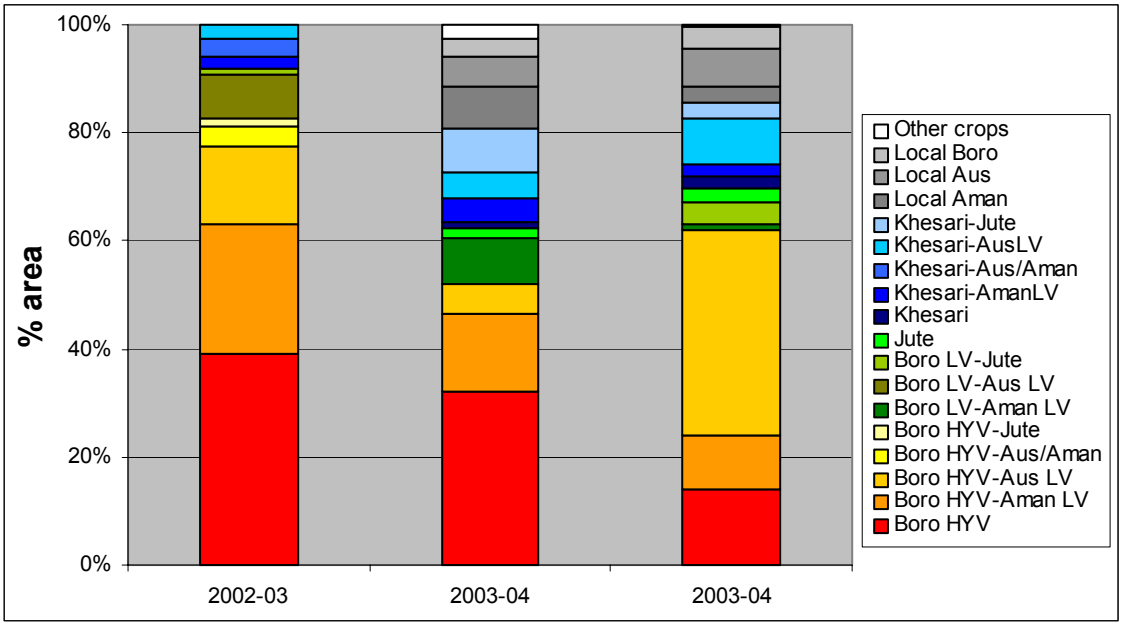


Figure 1: IFM Cropping Pattern Changes in Goakhola-Hatiara

Although there appears to be little change in the cropping pattern in Charan, this is most likely due to slow uptake of alternative cropping patterns. Farmers in the Charan *Beel* area are only able to plant one rice crop per year (for the most part) and are thus proportionally more dependants on dry season *boro* rice than farmers in other parts of the country (and indeed in Goakhola-Hatiara). However, that is not to undermine the changes that have taken

place. The 5% uptake in alternative *rabi* crops represents a starting point from which others, seeing its success, may be inclined to start production (Figure 2). Indeed, between years 1 and 2 there was a significant increase in uptake and discussion with farmers has indicated that they wish to increase production next year.

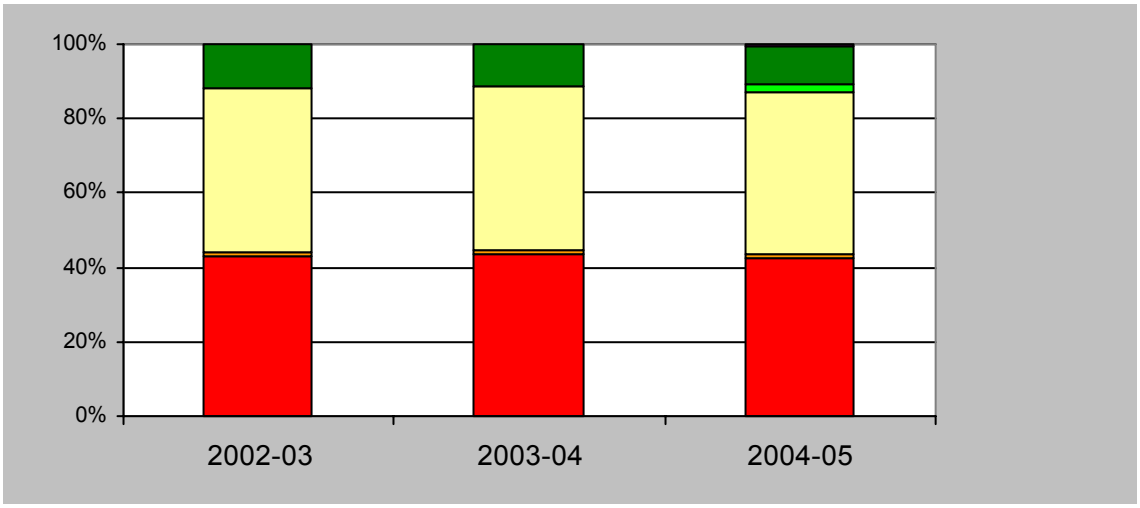


Figure 2: Cropping Changes in Charan Beel

As mentioned, farming patterns at both the sites have long been rice dominated. The farmers, sharecroppers, landowners, and irrigation machine operators are habituated with rice cultivation. Many farmers (employers of poor) and sharecroppers (mostly poor and self employed as well as employers of poor) are convinced that they could experience higher returns and other benefits from alternative *rabi* cropping and showed interests in continuation of crop diversification in the coming seasons. However, some irrigation machine owners are still confused as to the extent that they may benefit from watering. For this reason, this section of society, although they are very few in number (only 8 LLP owners in Charan *Beel* site compared to over 600 farmers), is not in full agreement/support of cultivating alternative *rabi* crops on their land or within their command area. Although some machine owners and landowner were motivated during the project period, there is still room for further work to motivate them.

Comparing the cost and returns of all *rabi* crops, the results from potato was found encouraging with an average net profit of Tk.43,573/ha, against an investment of Tk. 53,045/ha (82% return over investment) (Figure 3 and 4). Thus, one has to invest relatively more money to cultivate potato than rice, which is difficult for poor farmers. However, micro credit from NGOs may help marginal/small farmers to continue potato cultivation.

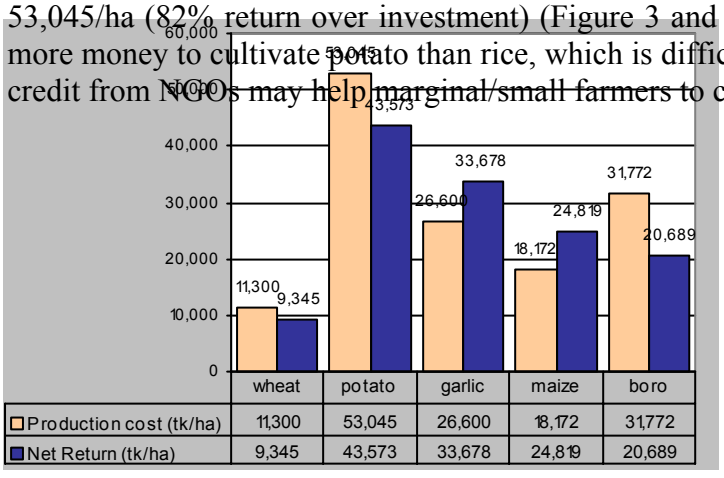


Figure 3: Cost and return from *rabi* crops

After potato, garlic produced the second highest return, Tk. 33,678/ha with a return over investment of 127% and a production cost (Tk. 26,600/ha) lower than *boro* (Tk. 31,772.ha) (Figure 4). Maize was found to be the most suitable alternative of *boro* rice, based on its cost and return compared to *boro* rice and other crops (at 137% maize

(Figure 4). Maize was found to be the most suitable alternative of *boro* rice, based on its cost and return compared to *boro* rice and other crops (at 137% maize produced the highest return over investment). Wheat can also be a low cost alternative with higher returns (78% over investment) than *boro* (65%).

Based on the production performance and analysis of cost-benefits of different *rabi* crops, it can be concluded that all four *rabi* crops piloted are suitable alternatives to *boro* rice, at least in areas with similar hydrology to the Charan floodplains. Therefore, depending on land elevation and soil quality, farmers can continue cultivation of these *rabi* crops profitably alongside *boro* rice at lower elevations, where other *rabi* crops are not suitable.

The farmers in Goakhola-Hatiara site, through CBFM-2 or with the assistance of the DAE, may continue to test alternative *rabi* crops (potato, garlic, maize, or wheat) in the future to find suitable alternatives to *boro* rice (Figure 5).

However, farmers can readily adopt *khesari*, potato, and short duration and water tolerant *aus* rice (*ratul*) as these have proved successful in piloting. It was observed in both the IFM sites that HYV *boro* cultivation has been gradually reducing whilst cultivation of other *rabi* varieties has been increasing.

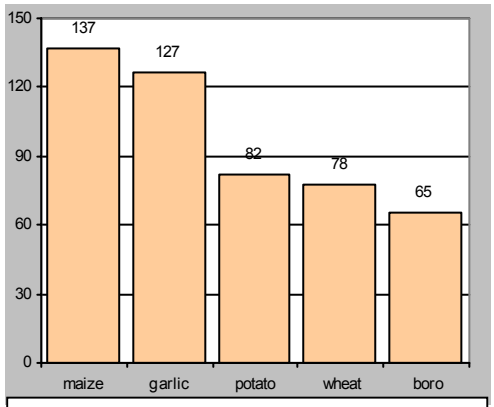
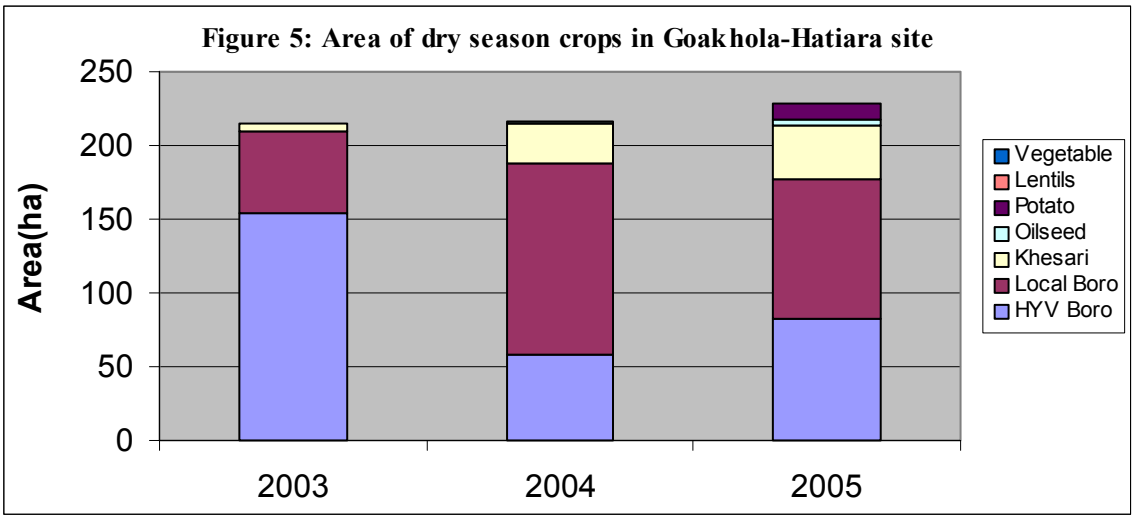


Figure 4: Return over investment (%) for different *rabi* crops

Figure 5: Area of dry season crops in Goakhola-Hatiara site



Fishing effort control

Beels and rivers are the primary sources of floodplain fish stocks; fish over winter in perennial *beels* and rivers in the dry season play a key role in maintaining production levels through reproduction in monsoon (WARPO/EGIS, 1997). Therefore protecting the dry season stock of fish is important to maintain sustainable fisheries production in floodplains. The DFID assisted CBFM-2 project introduced, with the cooperation of BMCs, the following fishing effort control measures in both pilot sites:

- Closed area: fish sanctuaries established to reduce over fishing.
- Closed period: 3 months fishing closures in the early monsoon (mid-April to mid-July) to protect brood to spawn in floodplains.
- Ban/reduction in use of harmful gears (e.g., *moshari Jal* (mosquito net)*, current Jal*)
- Complete ban on dewatering and barriers that block migration routes

In addition to fishing effort control measures, alternative *rabi* cropping also contributed to increased water levels in the *beels* during the dry season, aiding fish growth, and secured refuge have also contributed to enhance fish production and higher species diversity in pilot sites, as observed over the two years. Figure 6 shows that fish production increased in the pilot sites and there is strong relationship between fish production and water volume in the *beel*s.

Data revealed that estimated fish catch was 72.5 MT during the first year (1999-2000) of monitoring and declined gradually until the fourth project year (2002 - 2003) to 45.89 MT (Figure 6). Catch increased following CBFM-2 interventions from the fifth year of monitoring (2003 - 2004) and reached 111.12 MT in the sixth year (2004-05). As per expectations, fish catch was highest in October/November and lowest during the dry season (Annex B 1, Chapter 6). It was also found that species richness was decreasing until the fourth year of monitoring (from 70 to 49) and increased thereafter, to 71 by the 6th year, indicating revival of species richness, most probably due to the combined effects of fishing effort control (sanctuary, closed season, restricted use of harmful gears) and water saving through *rabi* cultivation.

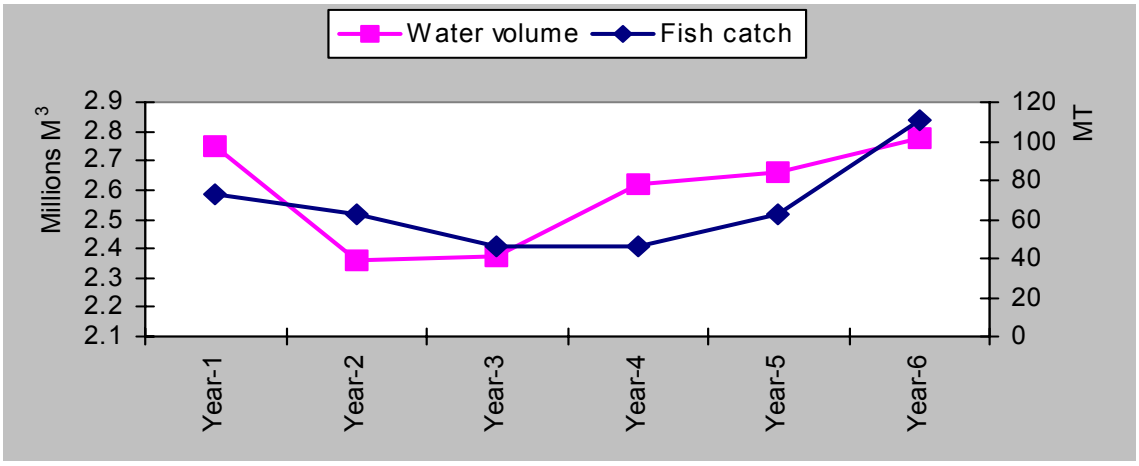


Figure 6: Fish catch and water volume in Charan *Beel* pilot site

Data also support the positive correlation between water volume and fish catch. The findings clearly show the volume of standing water in the previous year is correlated with the subsequent year's fish yield. The correlation coefficient of 6 years water volume and fish catch is 0.62. Positive correlation between water extent and fish catch was also observed in Goakhola-Hatiara site (Annex B 2, Chapter 7).

New issues from piloting IFM

Increased in fish mortality in the late monsoon as a consequence of water pollution due to jute retting was raised by the communities (BMC and IFM committee) in Goakhla-Hatiara. Facilitated by the project, the DAE and Jute Department, in conjunction with the IFM committee, conducted training on improved jute retting techniques (ribbon retting), creating interest among farmers, which will hopefully lead to practice on a wider scale.

Twenty IFM farmers in the Charan *Beel* site cultivated an extra crop (jute - 16 farmers and vegetables - 4 farmers) after harvesting alternative *rabi* crops, making higher profits, and creating interest among farmers; it is expected that more farmers will grow double crops in the future.

Output 2: Communication tools and methods

The second output has also been achieved in full, through fulfilment of each of the five OVIs. A comprehensive communications strategy was developed at the outset of the project, based on the findings of the communications need assessment survey conducted during the project development phase (PD124). During the course of the development of the communication strategy, as well as while it was in use, senior levels officials from various relevant institutions/projects contributed in enriching it and giving a practical nature to the strategy and development plan. The institutions, involved in developing and improving the communications strategy included the DoF, DAE, IUCN (SEMP), FFP, WFC, Caritas, Proshika, BRAC, BELA, MACH project, SIPP (Annex D, Communication strategy plan).

Communication products and tools developed

Communication products/tools	Number
1. Folk drama	2 scripts
2. TV spots	2
3. PowerPoint Presentations	4
4. Advertisements in special issues	2
5. Motivational/exchange visits	13
6. Presentation at national level workshop on the occasion of fish fortnight	1
7. Workshops/discussion meetings/site visit: • National level DOF and DAE HQ • Mid level DOF, DAE and NGOs	7 2 5
8. Fact sheets	22
9. Posters	6 in English, 8 in Bangla
10. Policy briefs	4
11. Training module	1
12. Bill boards	7
13. Conducting training sessions	281 staff and about 100 farmers directly

The project developed and tested two media types soon after developing the communications strategy. A poster on IFM was drafted and finalized, incorporating feedback from field-testing. Later, based on recommendations from the different stakeholders (trainees of DoF-CBFM-2, communities, NGO staff), four more posters, on the importance and processes of IFM practice, were developed and distributed to target institutions for wider dissemination (Annex H, Resource Pack).

Folk drama performances and their impact in raising mass awareness are well established in Bangladesh from different development projects (GOLDA, CBFM, MACH, FFP, SEMP). CNRS and BS developed local talent to perform folk dramas in their respective communities with the support of CBFM-2. In both the pilot sites, with assistance of project staff, drama scripts on IFM (some additions and changes to CBFM script – that was more fisheries focused) were developed and staged drama shows were held in key project villages during year-1 - planning period (Goakhola-Hatiara and Charan sites) and year-2 - experience sharing (Goakhola-Hatiara).

In addition, a billboard was designed, tested, and mounted at the project sites. The messages highlighted dry season water use and the benefits of *rabi* crop diversification. Initially this was not planned; however, based on the recommendations of communities, government and NGOs officials that paid visits to the pilot sites, the project team designed and mounted the billboards in public places (Annex H, Resource Pack).

Four policy briefs were developed based on the recommendations of intermediaries and policy level stakeholders. Initially, one brief on IFM was developed in 2003 incorporating all relevant IFM messages and finalized incorporating comments and suggestions from stakeholders (including NRSP). Later, three more briefings were developed (on fishing effort control, cropping pattern management, and sluice gate management) and distributed among the senior officials of intermediaries, and policy stakeholders (Annex H, Resource Pack).

The project reached over one hundred of officials in both government agencies and NGOs who are in the decision-making hierarchy (policy level stakeholders). Dissemination and sharing workshops, and meetings with DoF headquarters (including the DG-DoF), DAE headquarters, DoF-FFP senior staff, and PNGOs, BWDB, CBFM-2, LGED-CBRMP, IUCN, ITDG, and government district level officials, were well communicated through workshops and field visits (Annex A Table 7.2). Selected officials from these institutions also contributed in developing the policy briefs and IFM resource materials including posters, billboards and fact sheets.

The awareness raising events at both sites reached over 2,000 community members, on IFM issues and experiences of piloting results, by the project end. These communities included participating farmers, fishers, non-participating farmers, and fishers around pilot sites, as well as those from other areas, or involved in other projects. The communities visited the sites and interacted with piloting farmers/fishers from IC-LEAF project in Sunamgonj, SEMP in Sunamgonj and Moulvibazar districts in the north-east, MACH project CBOs from Sherpur and Kaliakoir, CBOs from CBFM-2 project from Magura, Kishoregonj, and FFP CBOs from Magura (Annex A, Section 7).

As defined in the project logframe OVIs, a comprehensive resource pack has been developed on IFM. The contents are designed in four forms; fact sheets, posters, billboards, and policy briefs. The contents of the resource pack have been designed based on initial recommendations received from selected stakeholders and the experiences of the team gained from interactive sessions with different stakeholders. The resource pack includes fact sheets on IFM related topics to give the user a clearer understanding of the issues and processes. Note that the pack includes messages from related NRSP projects such as IFM - promotion (R8306), IFM - consensus building (R8223) and IFM - institutions (R8195 and 8495). Relevant messages from an FMSP project on sluice gate management (R8486) have also been incorporated in the resource pack and policy briefs.

Output 3: Institutional learning around IFM

Although, regrettably, the project was unable to achieve this output in full due to significant institutional barriers, considerable progress was made towards completion of this output. Success factors for the promotion of IFM at government, NGO, and community levels have been identified through reflective learning sessions, Focus Group Discussions (FGDs) and workshops (Annex A, Section 7.2). Success factors for further uptake and promotion of IFM by their institutions were discussed at length. CBOs and intermediaries emphasized the following success factor for further promotion of IFM:

Collective action – The focus should be on floodplain communities as a whole (not just fishers or farmers) and entire resource user communities (fishers, farmers, sharecroppers, LLP

operators, other resource collectors/users) should be targeted and involved in resource management planning and implementation.

Attitudinal change in defining food – There is need for change in understanding of the definition of food. Floodplain development planning is heavily biased towards rice production under the "grow more food" slogan. However, it is emphasized in the promotion of IFM that "grow more food" does not necessarily mean "grow more rice".

Micro level planning – There are variations in land elevation, flooding regimes, and local ecosystems, and thus IFM promotion requires attention at the micro level (basin level planning) rather than regional planning (indeed there is remarkable variations within floodplains)

Water management first – water is the key determinant of floodplain production systems and thus the issue of water management should be given priority in IFM planning. Balanced use of water for fish and crops should be ensured, and more importantly should be conceptualised by policy stakeholders and intermediaries.

Systems focus – IFM is a holistic management approach for floodplain resources. It addresses fish and crop production system whilst recognizing water is the key factor that influence floodplain production systems. Therefore, it is emphasized that the IFM promotion should consider the systems approach as opposed to sectoral approaches that manage either fish or crops.

Outputs related to OVI 3.2 and 3.3 are described under the uptake promotion section of this front end.

Although the BMCs formed by the CBFM-2 are functional, they primarily deal with fisheries management issues. The project felt it necessary to target farmers involved in IFM separately, to ensure holistic resource management in coordination with BMCs. The farmers were thus organized into IFM committees in both the pilot sites, with specific management targets of cropping pattern, and water/sluice gate, management activities.

The BMCs were formed with fishers of different categories; the IFM committee was formed with farmers, thus it was felt that cooperation and interaction between the committees might raise some problems. However, not only was it found that there were some common members, but that moreover, being from the same community, they have regular informal discussion about their activities, and further, formally agreed to have joint issue-based meetings and actions for improved IFM.

These two CBOs, formed at the outset of the project have been instrumental in the accomplishment of all activities associated with piloting options. At end of the project (August and September 2005) these two groups undertook reflective learning sessions on IFM events, activities and related experience gained over the last two years at both the sites (Annex B1 and B2).

Strengths and weaknesses of IFM piloting were assessed in Charan site and are as follows:

Strengths of IFM Piloting

- Communication from grassroots levels with the farmers to the policy levels was carried out satisfactorily. Through other farmers' visits to the pilot site, it was possible to disseminate information about the approaches and options to many farmers from different parts of the country.
- Initiatives to improve local level communications, ensuring relevant local government official's support, were successful.

- Farmers organized under the IFM committee, shared experiences and ideas, and support in coping with new situations. They are also interested in giving an institutional form to their IFM committee through registration with the government.
- The idea of working as a team is developing among the farmers.
- As a CBO, the capacity to reach the local government offices has increased; in addition officials are showing an interest in visiting the pioneering farmers.

Weaknesses of IFM Piloting

- There is still much that could be done to popularise IFM at the policy level, to see real and relevant policy changes, initialising new projects and activities, to make the floodplain resource management sustainable throughout the country.
- The achievement of new arrangements with the LLP owners and landowners are among the challenges, though dialogue is ongoing towards an amicable positive arrangement between the concerned parties.
- Organizational strengthening and institutionalisation (registration, formal linkages with the other local institutions like UP) of the IFM committee is still to be achieved.

Stakeholders' (seven groups comprised of fishers-BMC and non-BMC, farmers -IFM and non-IFM, women fishers and farmers, LLP operators, male and female groups) evaluation on ten issues/activities that included IFM committee, BMC-CBFM, cross/exposure visits, trainings, communication and linkages, *rabi* diversification, farmers and LLP owners, share croppers and landowners, marketing of new crops and supply of quality seeds as the key factors for sustainable IFM at local level.

Social analysis in Narail site found that all stakeholders thought IFM very relevant and largely attributed benefits and changes in the last two years to the project. All local community participants felt they had been strongly involved in decision-making but to some extent government officials felt left out of this process. The IFM experience was also seen as empowering by all stakeholder groups, although trust and harmony were not thought to have improved tangibly .

5 Research Activities

The project team carried out a range of activities to attainment the desired outputs, and thus achieve the project objectives (Box 1). In order to detect changes and assess impact, a comprehensive data recording systems was in place, covering both the qualitative and quantitative aspects (details in Annex A section 3.2). A summary of data collected by sites is presented below:

Quantitative

- Household (farm) baseline and impact survey, covering all plots – land characteristics, crops grown, inputs and outputs
- Census on LLP and STW locations, mapped, monitored for water use (by crop) and operations 2003 - 2004 and 2004 - 2005 in both pilot sites
- Data on sluice gate opening and closing recorded from 2004 - 2005 onwards in Goakhola-Hatiara site
- Water level data recorded from BWDB and water gauge monitoring from pilot sites
- Crop production, costs and benefits from the pilot plots in both the sites for years -1 and -2.
- Fishing effort and Fish catch data from CBFM-2 project (monthly catch survey data)

- Water area mapping and volume determination, water flow system, characterization, and DEM (digital elevation model) carried out once in both sites during monsoon.
- Deep water *aman* variety trial with BRRI in Charan site in years -1 and -2

Qualitative

- RRA and FGDs with communities and stakeholders at both sites, district, and at head quarters
- PAPD at field sites with major focus on crop, water, and sluice gate management
- KAP survey on IFM related knowledge, attitudes, and practices both pre- and post- project
- Process diary on IFM piloting and relevant changes, report cards on institutional sustainability by CBOs
- Reflective learning on IFM and livelihoods impacts using FGDs

Box 1: Research activities and methods

Activities and methods
Output 1: Improved IFM options successfully piloted in different environments
▪ *Pilot site selection:* Selected two CBFM-2 project sites based on biophysical and socio-economic features needed for piloting IFM options. Site characterization was done through RRA, resource mapping, crop survey and analyses of hydrology and fish data ▪ *Community mobilization and consensus:* Through various sensitisation events (viz. group meetings, folk drama, courtyard meetings) and PAPD focusing IFM and monitoring of results. Following PAPD, IFM committees formed for carrying out IFM piloting activities ▪ *Capacity and skills:* Training, exposure visits (cropping pattern, water management and institution were the focus), strengthening linkages between communities and local service providers. Piloting options: ▪ Crop diversification: In year-1 (2003 - 2004) participatory crop selection trials with various *rabi* crops and in year-2 (2004 - 2005), piloting in more areas with selected crops as per farmers choice in cooperation with local DAE ▪ Fishing effort control: Closed area and closed seasons through CBFM-2 – data used from CBFM-2 and BMC monitoring ▪ Sluice gate management – IFM committee negotiated with BWDB and operated the sluice gate in a fish friendly manner in year-2 (2004 - 2005) ▪ Water pollution: DAE and Jute Department trained communities and staff on improved jute retting techniques
Output 2: Tools for effectively communicating IFM recommendations and methods/options to reach target audiences (including policymakers, intermediaries, and community practitioners) developed
▪ Communication strategy and plan developed based on need assessment findings and revised in year-2, KAP (knowledge, attitude and practice) survey (pre and post) to assess current status of stakeholders around IFM ▪ Communication tools developed included posters, handouts, billboards, folk-drama scripts (for community), message on IFM, fact sheets, training module, power point presentation, (for intermediaries) and policy briefs (policy stakeholders) and TV spots for all ▪ Communication methods included court yard meetings, knowledge sharing sessions, exposure visits (*rabi* areas, CBOs), PAPD, training, (for communities), training, power point presentation, visiting pilot sites, workshops, organizational/project planning meetings, (for intermediaries) and briefing/national workshops, exposure visits (policy stakeholders) and broadcasting TV spots for all
Output 3: Institutional learning systems in relation to IFM assessed.
▪ Process monitoring carried out using process diary maintained by the project team at site level, CBOs' capacity monitoring using report cards (developed jointly) ▪ Reflective learning and revising plan of action annually at pilot site with communities and stakeholders ▪ Learning from IFM promotion through reflective learning sessions with stakeholders

6 Environmental assessment

6.1 What significant environmental impacts resulted from the research activities (both positive and negative)?

Floodplains do not exist in isolation, but as part of a much larger system. The potential yield of a floodplain fishery depends on environmental factors in both the local floodplain area and throughout the delta (FAO Fisheries Technical Paper 384/2, 1999). Productivity, structure, and functions of floodplain ecosystems require supplies of water and regular inundation.

IFM options recommended in R7868 support supply of water and regular inundation of floodplain for a longer time. The expectations in piloting IFM banked on validation of approaches that support productive and sustainable natural resources and the evidence in supports this – as enhanced prolonged water retention (spatial and temporal), enhanced fisheries productivity, higher biodiversity, balanced use of surface water. Less use of agrochemicals in alternative *rabi* crops and habitat effect of deep-water *aman* rice in monsoon are all have positive impact on environment There was no negative impact of research activities detected.

6.2 What will be the potentially significant environmental impacts (both positive and negative) of widespread dissemination and application of research findings?

Widespread dissemination and application of research findings will potentially contribute to reducing and ultimately reversing the trend of degradation of floodplain environments, thereby ensuring wider benefits and greater livelihood security for the communities that use the resources.

6.3 Has there been evidence during the project's life of what is described in Section 6.2 and how were these impacts detected and monitored?

There was clear evidence found during the project's life that fish catch and species diversity have increased, water and soil quality have improved, and that the dry season water area has increased. The effects were revealed through 6-7 years of fish catch and hydrology monitoring (under CBFM and IFM projects). There should be positive effects on soil quality (yet to be monitored). It has already been found that people who cultivated jute after potato experienced better crop growth and required less fertilizer. The technology for soil testing is low cost and DAE has agreed to assist farmers in this regard. Water quality deterioration and subsequent increases in fish mortality are expected to decline in the future, provided that there is strong uptake of improved retting techniques - something that can be monitored locally through observation and water testing.

6.4 What follow up action, if any, is recommended?

In the context of environmental impact, no follow up action is required. It is recommended that research findings be made available to a wider audience.

7 Contribution of Outputs

7.1 NRSP Purpose and Production System Output

The outputs produced by the project are in line with the NRSP purpose and production systems outputs of *"improved resource use strategies in floodplain production systems developed and promoted"* from the following standpoints:

The piloting results proved that the IFM options, based on computer modelling exercises, worked well at the field level from a technical, social and institutional standpoint (except the land retirement option[8]). The findings of piloting indicated that the options were applicable and acceptable at the field level and produced positive results in terms of increased production and income from both fisheries and cropland (Annex B1, B2 and Annex C, process monitoring).

New approaches to integrated floodplain management that explicitly benefit the poor were tested and validated by 2005. The 3 IFM options - cropping pattern management, fishing effort control, and sluice gate management were successfully piloted, with positive results for both farmers and fishers. The participating farmers and fishers, project staff, visiting farmers-fishers, and officials of different GOB departments and NGOs validated the options. The fourth IFM option, land retirement, was found difficult to implement in the context of Bangladesh, as it is a land hungry country, where population density is very high.

At the same time, incorporation of these new approaches started at different levels and strategies. The options are already incorporated in DoF's the draft open water fisheries strategy; it is expected that there will be implications in the formulation of new projects and activities of DoF. Similarly, DAE also showed interests in alternative *rabi* crops in *beel* areas and there exist opportunities for incorporation in their existing crop diversification activities. Additionally, both the departments agreed to incorporate IFM in their respective training curricula. Many DoF staff have already received training on IFM through the CBFM-2 and Fourth Fisheries project.

The participating communities (fishers, farmers, sharecroppers, women, LLP operators), organized into BMCs and IFM committees (CBOs), evaluated all the activities undertaken in their respective sites and assessed various livelihood capital gains and organizational learning areas, in reflective learning sessions. The participants also identified the strengths and weaknesses of IFM piloting and promotional efforts (Annex B1 and B2).

The most important learning outcome from the project is that the integration of various floodplain resources under a holistic management programme can be successful, in terms of integrating different occupational groups (primarily the fishers and farmers) to plan and resolve problems relating to the management of CPRs, and utilizing knowledge and skills gained from the project interventions (enhanced human capital). The culture of mutual interactions, discussions, and sharing of common issues amongst different groups, both formally and informally, has been instrumental in furthering IFM , even beyond the project areas (social capital). The participating farmers came up with the idea of growing an additional crop after harvesting *rabi* (instead of remaining fallow) and this reflects enhanced human and social capital applied towards better utilization of scarce floodplain resources (natural capital) under IFM.

CBOs organized under the project contacting BWDB, DoF, and Jute Department for sluice gate and water quality issues, again reflecting the gains in human and social capital. Increased production of *rabi* crops and fish (including higher species diversity) and higher income (financial capital) are proof of better management of natural capital upon which communities' livelihoods are heavily dependent (a gain in natural capital).

[8] *Of the four IFM options, land retirement was found difficult to implement or may not be practical in a context in which people tend to use whatever land is available for cultivation in floodplains. Farmers showed strong reluctance to this option even though they supported it in theory (Annex F, KAP survey report).*

Communities and stakeholders' assessment reflected IFM application and piloting results, a win-win situation (among the key floodplain users -farmers and fishers) or a win-neutral (farmers-LLP operators and sharecroppers-land owners). There exists potential and evidence of horizontal expansion of IFM around pilot sites.

The communication tools and methods developed have proved successful in reaching target audiences at all levels, from the grassroots practitioners to intermediaries and policy stakeholders, regarding IFM options and the benefits of application and promotion.

Considering the findings and achievements, it can be concluded that successful field level application of IFM options (fishing effort control measures in a situation where over-fishing was being the practice, alternative *rabi* crop diversification in a rice dominated culture, fish-friendly sluice gate operation in an area where rice is the only consideration) proves that communities and stakeholders responses to IFM have been positive, and thus, that the project has successfully contribute to achieving the NRSP's purpose and production system (LWI) outputs. As the project is more focussed on uptake promotion, all these achievements and contribution have been made possible due to the communication tools and methods applied over the entire project life.

7.2 Impact of outputs

The project was initiated with the purpose of developing and promoting methods for the implementation of management opportunities relevant to the poor, including community participation in integrated sustainable management of terrestrial and aquatic floodplain resources. To this end, the purpose level project OVI's (not including uptake promotion) were:

- By September 2005, improved IFM recommendations validated in two locations and at least two communities use recommendations that balance crop and fish production
- At least two organisations test and report on IFM strategies in their own programmes by September 2005
- Attitude of target audiences towards the need for IFM strategies which deliver livelihood benefits to poor farmers and fishers are positively/favourably changed

The project-generated outputs have had marked effects on floodplain production systems, in maintaining ecosystem functions and integrity, as well as approaches for maximising joint benefits from land and water based production systems. They thereby improve the livelihood outcomes of the people, especially the poor households, who subsist largely on a range of floodplain resources over all seasons.

The fishing effort control measures resulted in increased fish production and species diversity in both the sites, which will allow the poor and fishers to catch more fish in floodplains where they still enjoy access under different arrangements. In the case of CBFM and other development projects, water-bodies are leased to communities (BMCs) for longer terms (10 years - renewable if they continue better management), thus the benefit of fishing effort control has the potential to be sustained and used by the DoF and communities/CBOs in other areas. BMCs, as local fisher organizations, are better able to implement the fishing effort control option by themselves, and have strong potential for sustainability beyond the project life (although they may need further facilitation support).

The cropping pattern option, though it was assumed that it would be difficult to bring changes in attitude of farmers, proved acceptable and resulted in higher benefits to farmers compared to *boro* rice. This has been possible due to the project approach of; inclusiveness

of all, facilitation, training, and technical backstopping; exposure visits to good crop growing areas; and ensured supply of quality seeds. Findings show that all the four *rabi* crops produced higher benefits and the possibility of double cropping (*rabi* followed by jute or vegetables before flooding in place of single *boro* rice that often damaged by early floods)

Poor households potentially benefit through crop diversification, as it was observed that wheat is harvested earlier (by mid-March) when people in the Charan area suffer from food-crisis due non-availability of jobs (as *boro* harvesting starts from late April/early May). Poor households/farmers can earn money and food harvesting wheat (alternative *rabi* crop), thus mitigating the crisis before the *boro* crop comes in. Jute, not a *rabi* crop but possible if alternative *rabi* is grown, also provided employment locally for the landless poor, as jute is harvested later – after *boro* harvesting is over, thus creating jobs for men (not possible without IFM condition) in sowing, harvesting, retting, separating fibres and washing, and for poor women and children in separating fibres (they get either cash or jute sticks instead – jute sticks are used as fuel and fencing and are otherwise costly).

Sluice gate operation to facilitate entry of river water early in the season was possible through negotiations between the IFM committee, gate manager, and BWDB in Narail, resulting in the gate being opened in May. In addition, a pipe sluice, made by the communities under the project, had an immediate effect by bringing around 27 ha of additional land under *aus* production. Although the immediate impact of the extra pipe sluice on crops is apparent, the overall impact of that structure and of changes in sluice operation in 2005 will not be revealed until fish catch data from the last three months of 2005 is available. However, it is expected that there will be positive impact on fish catch and species diversity due to the additional sluice gate and fish friendly (open gates in early monsoon) operation of existing sluice gate.

During the course of the project, interest in IFM among the stakeholders/TIs has been visible. There is evidence of incorporation of IFM options and processes by different target institutions/projects (Text Box 2). It is however noted that the promotion of IFM at institutional level and on a wider scale will be slow. The major reason is that the institutions and their projects have pre-defined objectives and activities and as such, adopting IFM options will require time.

Text Box 2: Target Institutions/projects incorporating/testing IFM – evidence of uptake of research products

- DoF incorporated IFM recommendations (fishing effort control and sluice gate management) in the national inland fisheries strategy (draft approved by the government in December 2005)
- DoF is keen on cropping pattern management option for benefiting the floodplain fisheries and facilitated dissemination of findings through the national fish fortnight-2005 in August and arranged presentation on the topic by CNRS in workshops
- DoF already incorporated IFM module in their central training programme of CBFM2 project and trained 280 staff (DoF and NGOs)
- DoF CBFM2 project supported training of 100 farmers on cropping pattern options in Kalihati areas (around Charan Beel pilot sites) for 2005-06 cropping year (beyond the project)
- USAID assisted MACH project already started cropping pattern option at one of the three project sites after visiting the pilot site and discussion with participating communities and staff. The project team also helped them collecting good quality seed for their farmers.
- The CBFM-2 project of the DoF making plans to disseminate the option in other sites in the next year. However, other CBOs of CBFM Kalihati area started testing cropping pattern option in 2005-06 *rabi* season, dissemination from Charan pilot site.
- LEAF (Livelihood Empowerment and Agro-Forestry) project of IC started testing cropping pattern in this year (2005-06) option after paying visits and promotional efforts of the project in the North-eastern *haor* area. It is noted that IC along with BRRI and CNRS already had a field trial on short duration *boro* rice in the *haor* area in 2004-05.

The overall effect of the interventions on knowledge was positive, and more importantly, retained by the villagers (Annex E – KAP Survey Report). Although in some cases, peoples expectations of the benefits of certain interventions was reduced, this indicates realism regarding the project interventions – recognising the positive effect of IFM, but not under the impression that wetland resources would be regenerated instantaneously. In terms of attitude adjustment, it was seen that whereas in some areas, pre-project, people were unaware or against certain aspects of IFM, by the end of the project, their attitudes had changed. A prime example is a statement in the KAP suggesting that fish and crops were of equal importance in floodplain management. In the pre-IFM survey, 50% showed a negative attitude to giving equal importance to fish and crop (disagree / strongly disagree), while post survey, over 95% agreed with the statement. This reflects positive attitudinal change, in favour of IFM and joint benefits through joint planning. Indeed, even in the case of land retirement, which proved unworkable in practice, there was a shift in attitude, recognising the need for intervention.

7.3 Uptake Promotion

The policy influencing process in Bangladesh is lengthy and ad hoc, and to some extent needs a big push and continuous effort. In contrast, based on experience, it has been found easier to pilot or test any new technology at field level with participating communities. Such a case is IFM promotion where communities at pilot sites have taken a pro-active role in adopting IFM, under the project's facilitation. Moreover, the field level officials of the government's relevant line agencies (DoF, DAE, BWDB, BRRI, and BARI) also expressed a positive attitude and played a positive role in creating an enabling environment for piloting/testing IFM.

DoF and DAE headquarter level officials showed a positive attitude towards IFM after the IFM messages and piloting results were communicated through workshops, and expressed interests in paying visits to pilot sites to see for themselves how the options are applied in a field situation, and community's responses. After visiting the pilot site DAE headquarters officials instantly instructed their respective field officials to extend all support needed by the project and communities at the field level. DAE suggested communicating the IFM messages to the parliamentary standing committee on agriculture and accordingly the brief is developed and handed over to DAE for action.

The DoF headquarter officials after site visits asked the project team to make a presentation at the DoF headquarters, indicating their interests in IFM. The DG, DoF, and senior policy level officials of DoF attended the workshop and emphasized the importance of inter-departmental coordination for successful IFM promotion. The positive attitude of the DoF on IFM was also reflected as they selected a paper on IFM ('benefit of cropping pattern change on floodplain fisheries') for presentation in the national workshop on the occasion of the annual fish fortnight in August 2005.

Although DoF incorporated the IFM partially (fishing effort control and sluice gate options) their interests expressed in cropping pattern change during field visits and workshops should be taken forward through specific actions and the push should be continued beyond the project. Currently on going CBFM-2 and MACH projects can be a good vehicle for achieving this. CNRS being partners of these projects could play the key role.

The communities (non-participants) in and around pilot sites as well as in distant places (north-east *haor* basins in the Sunamgonj and Sherpur districts) have started piloting cropping pattern change options under CBFM-2, SEMP, MACH and IC-LEAF projects (in

2005-06, beyond project the project's end date). Changes need to be monitored and assisted as necessary.

Community-based resource management project (CBRMP) of LGED/IFAD in Sunamgonj showed interests in IFM but has yet to start. There is potential that further communication and technical support can ensure adoption of IFM through LGED. It is expected that better dissemination can be made possible through LGED as their current project (CBRMP) covers all the upazilas of Sunamgonj district in phases.

It is also to be noted that incorporation of IFM in the DoF training manual (CBFM-2) is not enough. Training of Trainers (ToT) on IFM for the DoF training staff should be a target to develop future capacity and skills in facilitating IFM in wider areas. The draft training module and resource pack developed under the project will need further updating and improvement to target a wider audience. There is inadequate focus on sluice gate and cropping pattern management issues in the current resource pack, and the training module developed that need to be enriched.

The agreement signed between CNRS and the DAE, BRRI and BARI for promotion of IFM needs continuation beyond the project in order to widen uptake and use of IFM. DAE has agreed to take forward the IFM options at national level, and there is need for further work and push with the policy briefing notes that were submitted to DAE to influence the parliamentary standing committee. Current working relations with DAE, BRRI, and BARI around IFM can be used as a communication pathway to reach the policy stakeholders.

Work with the BRRI on deep-water *aman* variety trial should be continued for at least another year in Charan *beel* to work with the varieties that performed well in 2005 in the research plots. Now participatory variety selection trial is needed where the farmers (participants and non-participants) can select their varieties based on field performance of varieties at the farmers' level. CNRS and BBRI have already agreed to conduct farmers' variety selection trial next year (2006).

There is potential for further achievement in this area with SHOUHARDO project of CARE and MACH project to incorporate IFM training in their project-training module and, being technical and implementation partners of both the projects, CNRS would be willing to take the initiative beyond the project.

Sluice gate operations for balanced water use for crop and fish could be a complex task as the opening and closing decisions are restricted to the rich and influential farmers. BMC or IFM committee may find it difficult to convince local gate managers/care takers (or even BWDB) to ensure fish friendly operations of gates at the project end. BWDB officials need to be aware and sensitised of the issue, at least at the local (upazila and district) level for future application. However, FMSP project (R8486) on Promotion of FMSP Guidelines targeted the local, district and national BWDB officials on sluice gate management issues for benefiting fisheries and farming within modified floodplains. It is imperative that further intensive work is required to make the recommended sluice gate management options operational at local level.

The communities (participating and non-participating farmers) and secondary stakeholders at local level improved their skills and achieved behavioural change. Land ownership and farming decisions, markets, quality seeds, compliant LLP operators, water availability, and water quality are critical factors for the sustainability and promotion of IFM. Further strengthening, support and facilitation may increase the possibility of sustainable fish and crop management in floodplains. Steps to be undertaken include coordination of IFM issues among the floodplain actors mainly between DoF, DAE, and LGED, aiming to influence

them to incorporate IFM in their extension programmes and projects.

Presentation of papers on the IFM piloting and promotion at national and international levels would be a suitable pathway for wider uptake promotion of IFM. The project team are planning to present two oral papers on IFM in the up coming biennial conference of the "Bangladesh fisheries research forum (BFRR)" to be held in 18-19 January 2006. This would contribute to wider dissemination of IFM options and communication issues

Based on the previous experience relevant to PAPD promotion in Bangladesh and beyond, CNRS (project leader) is optimistic about the future promotion of IFM in Bangladesh in wider scale but it will take time and promotional efforts.

8 Publications and other communication materials

8.1 Books and book chapters

None

8.2 Journal articles

8.2.1 Peer reviewed and published

None

8.2.2 Pending publication (in press)

None

8.2.3 Drafted

None

8.3 Institutional Report Series

None

8.4 Symposium, conference and workshop papers and posters

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8.5 Newsletter articles

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8.6 Academic theses

None

8.7 Extension leaflets, brochures, policy briefs and posters

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8.8 Manuals and guidelines

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BTV-national TV media in Bangladesh. **2005.** *Introducing sustainable cropping pattern instead of boro cultivation and practice of sanctuary, sluice gate and land retirement management* 15 minutes TV spot telecasted on 16 March 2005 at 7.30 pm under a very popular program "*Mati O Manush*" (soil and people)

BTV-national TV media in Bangladesh. 2005. 12 minutes TV spot on IFM Charan site experience telecasted on 14 May 2005 at 8.40 pm under the program "*Safalya Gantha*" (Success stories).

8.10 Reports and data records

8.10.1 Project technical reports including project internal workshop papers and proceedings

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8.10.2 Literature reviews

None

8.10.3 Scoping studies

None

8.10.4 Datasets

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8.10.5 Project web site, and/or other project related web addresses

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10 Project logframe

NRSP PROJECT LOGICAL FRAMEWORK (REVISED 16 FEBRUARY 2005)

Revisions since post-MTR logframe 29 Oct are in yellow blaze. **Insertions and deletions can be viewed in Track Changes Show Insertions and Deletions**

R8306	**PS ref: LW/2.3.3 (a)**

Narrative summary	**Objectively verifiable indicators**	**Means of verification**	**Important assumptions**
Goal			
NRSP-LW Output 2: Improved resource-use strategies in floodplain production systems developed and promoted	By 2003, new approaches to integrated natural resource management which explicitly benefit the poor validated in two targeted areas By 2005, these new approaches incorporated into strategies for the management of floodplain resources, including common pool resources, in one target country	Reviews by Programme Manager Reports of research team and collaborating/target institutions Appropriate dissemination products Local national and international statistical data Data collected and collated by programme manager	Target beneficiaries adopt and use strategies Enabling environment exists Budgets and programmes of target institutions are sufficient and well managed
Purpose			
Methods for implementation of management opportunities relevant to the poor, including community participation in integrated sustainable management of terrestrial and aquatic floodplain resources, developed and promoted.	By September 2005, improved IFM recommendations validated in two locations and promoted to key policy actors and meso-level stakeholders to achieve attitudinal change. By project end at least two communities use recommendations that balance crop and fish production Attitude of target audiences towards the need for IFM strategies which deliver livelihood benefits to poor farmers, fishers are positively/favourably changed: At least 10 key decision makers illustrate a positive change in understanding towards IFM by September 2005. At least two organisations test and report on IFM strategies in their own programmes by September 2005.	IFM testing reports Attitudinal change surveys below Reports of community surveys Report on attitudinal assessment of key decision makers done by the project Organisational planning reports and strategy documents Meeting minutes, training plan and training manual of target organisations	Piloting of IFM options is successful.
Outputs			
1. Improved IFM options successfully piloted in different environments.	1.1 At least 2 IFM piloting activities established by November 2003.	Project report	The pilot and pre-testing years are average ones (at least in 1 sites)

	1.2 At least 4 categories of primary stakeholders plus secondary stakeholders successfully engaged and participating in piloting activities by end of 2004.	Lists of participating groups and other stakeholders	Consensus raised (built) *among* participant communities
	1.3 Adequate data collected to assess the IFM options and their acceptability to participants by end of project.	Analytical reports done by project team and participating communities	Willingness of stakeholders in learning the improved IFM options and related livelihood benefits of the poor
	1.4 By Jul 2005, pro-poor impacts detected (for both men and women) as a result of implementation of pilot improved IFM.	Reports on stakeholders' assessments of options	
2. Tools for effectively communicating IFM recommendations and methods/options to reach target audiences (including policymakers, intermediaries, and community practitioners) developed.	2.1 At least 10 key decision makers from different institutions participate in developing the communications strategy by end of 2003.	Communications strategy and list of participants	Communication strategy rightly incorporates views and needs of different audiences
	2.2 At least 2 different media types identified and tested for awareness raising in IFM by end of 2003.	Two media types of communication product on IFM	Target institutions and communities co-operate in the assessment and share limitations and constraints
	2.3 At least 50 decision makers from different types of institutions reached by IFM awareness raising events/ materials by end of project.	Awareness event report and list of participants. Evaluation report compiled from participants' evaluations of events & materials	Communication messages and tools/media types are suitable for concerned audiences
	2.4 At least 600 community practitioners reached by IFM awareness raising events by end of project.	Awareness raising materials/scripts, photographs of audiences	
	2.5 A draft resource pack for IFM planning is available by September 2005.	Resource pack of improved IFM	
3. Institutional learning systems in relation to IFM assessed.	3.1 By end of project, success factors in the project's promotion of IFM to secondary stakeholders at district (government) and programme (NGO) levels are identified.	Evaluation report, comparisons of attitudes pre and post	Relevant stakeholders maintained and made available all reports and information
		Agreements with TIs	

	3.2 By end of project, at least 2 target institutions have started testing IFM monitoring.	Agreements with TIs, first set of monitoring records (e.g. report cards &/or significant change summaries)	
	3.3 By end of project, at least 1 target institution has appropriate training related to IFM in place.	Institutions' training reports and adoption of modules	
	3.4 At least two community groups undertake reflective learning activities in relation to IFM, by end of project.	Outputs of reflective workshops, community group diaries and record books	
	3.5 By end of project, at least one third of participants in groups formed around the operation of IFM give indications, in their reflective learning discourse, of some institutional and livelihood capitals gains (particularly social and human)10.	Outputs of reflective workshops and focus groups, community group diaries and record books	
Activities	**Milestones and Budget**		
Output 1 - Improved IFM options successfully piloted in different environments			
1.1. Review models and make usable for application through (a) piloting/testing the model in a form for participant organisations, (b) investigating site specific factors that affect use of the model/ IFM options	MS 1.a Two workable versions of the model are reviewed and tested in two different sites by August'03.		**Budget**: £164,999 (UK pounds)
1.2. Develop IFM methodology for testing/piloting IFM options	MS 1.b A methodology is developed and tested for IFM piloting in 2 sites by September'03.		
1.3. Identify partner institutions/projects for piloting IFM options and make institutional arrangements keeping provision of during and beyond project period	MS 1.c. Modalities for institutional arrangements for piloting IFM during and beyond project period made by October'03. MS 1.d MOU signed between CNRS and partners/TIs to test and adopt IFM options by end of June 2004.		
1.4. Inform concerned communities about the IFM options and consensus raised (through consensus building workshops viz. participatory action plan development-PAPD) for pilot testing	MS 1.e. Training on IFM for fisher/farmer evaluated by March '03. MS 1.f. Agreed community action plan is ready by October '03. MS 1.g Agreement signed with 20 farmers for demonstration of alternative crops by end of June 2004.		

..5. Enhance skills of men and women community level groups in alternative practices in farming and fishing supporting IFM	MS 1.h. First training sessions in IFM evaluated at two sites by December'03.	
..6. Through CBFM 2 (community based fisheries management) project support and partner communities undertake changes in floodplain management	MS 1.i Project results disseminated through workshop with CBFM-2 partners and 6 other NGOs, and an action plan developed to adopt and practice IFM in future with the support from CBFM-2 by end of June 2005.	
..7. IFM piloting thoroughly monitored/assessed using a participatory monitoring tool and participatory assessment (IFM changes and local institutional performance in adopting IFM)	MS 1.j. Participatory monitoring tool tested and interim monitoring results validated at workshops in June 2005. MS 1.k. Results of first round monitoring disseminated by end of August 2005.	
..8. Preliminary analysis of monitoring results with communities and local institutions	MS 1.l. Methodology for analysis of monitoring data developed by end of September 2004.	
Output 2 - Tools for effectively communicating IFM recommendations and methods/options to reach target audiences (policymakers and intermediaries & practitioners) developed		
2.1. Plan communications media to raise awareness about IFM for all levels (decision makers through to communities), including linkages to relevant networks (e.g. Bangladesh Wetland Network)	MS 2.a. Final communications plan is agreed by end of March 2005.	
2.2. Draft and test initial communication media	MS 2.b. Draft media types developed on IFM by end of September 2004.	
2.3. Undertake awareness raising activities (e.g. exchange visits, mass communication) with primary stakeholders	MS 2.c. Two tested awareness raising activities on IFM conducted in two pilot sites by December'03. MS 2.d. Two awareness-raising activities tested and completed by March'04. MS 2.e. Exchange visits and training of farmers on alternative *rabi* crops taken place by March 2005.	
2.4. Produce and distribute communication media	MS 2.f. Draft IFM resource pack tested by March'04. MS 2.g. Printed awareness materials distributed *amon*g the target audiences by end of March 2005. MS 2.h. Video documentary on IFM as a promotional material tested and developed by end of June 2005.	
2.5. Monitor distribution of communication media, including resource pack	MS 2.i. Tested monitoring system for communications materials in place by end of November 03. MS 2.k. Results of effectiveness of communication materials distributed in place by August 2005.	

2.6. Revise the communication strategy based on continued experience with promoting IFM (initial communication strategy developed under PD phase)		
2.7. Assess use & relevance of communications media	MS 2.j. Revision of communication strategy and relevance of communication media assessed in workshops by July 2005.	
Output 3 - Institutional learning systems in relation to IFM assessed and promoted.		
3.1 Undertake a review of the communication processes used by the project to promote IFM to identify strategies, media and change agents which have been key to success (linked to activity 2.7, which monitors use, relevance and spread of communications media)		Communities are willing to undertake self-monitoring activities
3.2 With participating institutions develop a method for monitoring and evaluating progress of integrating IFM into their organisations' activities	MS 3.a. Draft monitoring protocol developed and adopted by December 2004.	
3.3 Make a review of participating institutions' current training activities related to IFM. This will include analysing higher level and vocational training programmes related to IFM.	MS 3.b. Several sets of relevant training modules/manuals/ handouts from participating/key organizations collected by end of September 2004.	
3.4 Identify tools and methods for enhancing community participation in monitoring their practices with IFM options.	MS 3.c. Community led monitoring tools tested by March'04. MS 3.g. Report on process documentation of participatory monitoring in place by August 2005.	
3.5 Hold workshops or other experience sharing forum at all levels to review and learn from community practices and experiences with IFM.	MS 3.d. Local reflective workshops held after 2004 and 2005 dry seasons by June 2005 in both pilot sites with key primary stakeholders and local intermediaries MS 3.e Project end workshop taken place to share experiences of project partners and results assessed by September 2005.	
3.6 Project team makes assessment of attitudinal change in stakeholders including the indicators that support the detection of this change	MS 3.f. Baseline status of key decision makers established by end of June 2004.	
	Pre-condition	Linkages with projects and locations for adaptive testing and learning. Availability of data for these sites

11 Keywords

Integrated floodplain management, IFM options, rice, fish, closed season, fishing effort control, land retirement, cropping pattern management, sluice gate management, up take promotion, policy stakeholders, target institutions, community, better options, communication strategy, participatory monitoring, poor, fisher, women, wetland, dry season water sharing, Bangladesh, Fisher-Farmer conflict.