Better Options for IFM: Uptake Promotion
NRSP Project R8306

Final Technical Report
Annex E

Report on

Knowledge, Attitude and Practices

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Knowledge, Attitude and Practice (KAP) Survey
Community level at Pilot site:
Charan Beel, Kalihati, Tangail

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1. Introduction

1.1 Background

Floodplains in Bangladesh are robust and diverse, formed by the depositions of three large rivers, the Ganges, Jamuna-Brahmaputra and Meghna, that pass through the country and end up in the Bay of Bengal. Due to the seasonal contraction and expansion of floodplains due to monsoon rains and melting of snows of Himalayan tips, the floodplains are very productive and resource-full, providing opportunities of millions of rural households for their livelihoods. The floodplain fisheries that comprise around 300 fish and shrimps species is one of the richest in the world supporting the livelihoods of around 1 million people. However, much damage has been made to these resourceful floodplains natural resources base largely due to unplanned development interventions. Notable among these are hundreds of flood control, drainage, and irrigation (FCD/I) projects and development of rural road networks. The FCD/I projects and rural roads fragmented the floodplain wetlands, disrupted water flow patterns, increased siltation and thus degraded and reduced the wetland habitats. In addition, increased siltation also affected floodplain wetlands and all these affected the fisheries, making the fishers and rural poor more vulnerable to food and livelihood insecurity.

The need for a holistic management approach for floodplain resources, taking account of the needs of all stakeholders, has prompted the development of an integrated approach to floodplains management. IFM (integrated floodplains management) is used to describe a number of interventions carried out in conjunction with relevant stakeholders towards improving the management of aquatic (floodplain) resources, shifting policy focus towards more pro-poor outcomes and ensuring the sustainability of the goods and services received from floodplain wetlands through balanced use of water for fish, crops, and vegetation, thereby reducing conflicts among various competing users.

CNRS, in conjunction with other partners, has been implementing an uptake promotion project with the aim of promoting IFM (integrated floodplains management) options at all relevant stakeholders, from grass roots practitioners to national level policy makers, with support of DFID/NRSP since 2002. The outputs of a previous NRSP project (R7868) recommended developing and promoting pro-poor methods for implementing IFM, in agreement with the participating communities, and thus piloting the options at field level has been an important activity of the project. To this end, clear understanding of communities' current knowledge of, and responses to, the options was vital for developing the approaches.

This study is an effort to determine the knowledge, attitudes and practices (KAP) of relevant communities on management of floodplain resources, which are multiple resources systems supporting livelihoods of communities of multiple social & occupational groups. The study addressed the issues relevant to the knowledge, attitudes, and practices of the concerned stakeholders on management issues, understanding of concepts, and ways forward in relation to practicing and promoting IFM at the practitioners' level.

"Knowledge is much more than a collection of facts" (Natural Resources Institute, The University of Greenwich), it relates to the whole system of concepts, beliefs, and perceptions that people hold about the world around them. This includes the way people observe and measure what is around them, how they set about solving problems, and how they validate new information. It also includes the process whereby knowledge is generated, stored, applied, and transmitted to others (communication).

Local peoples attitudes play a vital role in natural resource management and development. Understanding local peoples attitudes requires awareness of possible differences and complexities in how people view the settings around them, and in how they interact with their environment.

The potential benefits in utilizing and enhancing local practice and learning processes within the project are significant. A better understanding of what local people already know and the characteristics of local practices and norms can help the management organizations and local people to work together more effectively in implementing IFM, which has developmental impact.

1.2 Objectives

The broad objective of the survey was to improve the methods and approaches in promoting new knowledge practiced at the community-level, based on communities' understanding and attitude towards IFM and current practice relevant to floodplains management. The study is expected to provide valuable information on the following key areas needed for IFM practice and promotion:

- Current knowledge/understanding, attitudes and practices (KAP) of target user communities (fishers and farmers/non-fishers) towards IFM in relation to its use and practice;
- Perceptions of the community members on issues related to recommended IFM options (fishing effort control, cropping pattern management, sluice gate management and land retirement) and to the extent suitable in their local situations;
- Attitudes and practices of key target groups towards proposed IFM solutions/options and interventions;
- Willingness to adopt new practices to improve management of natural resources for joint benefits from floodplains;
- Specific forms of IFM interventions favoured by the communities based on their local environment and resource use pattern;
- Means of communication suitable for promoting IFM options at the practitioner level;
- Extent of communities' communications in relation to current floodplains management and future improvement that the project can take care.

It is expected that these findings will provide valuable inputs to the project team for refining the communication and promotion strategy during the course of the project, as well as for the CBFM-2 project, DoF, and its partners, to take action to influence the policy and practitioners regarding IFM beyond the current NRSP project (R8306).

2. Survey Methodology

2.1 Description of the site

The Charan Beel is located in Kalihati upazila, under Tangail district in central Bangladesh covers an area over 418 hectares in monsoon including 74 ha of perennial water-body (beel) at the lowest bottom. During monsoon the whole area become inundated and people do fishing in flooded lands and some farmers cultivate deep-water amon rice in low inundation depths. While in the dry season, water area reduced and confined to perennial area of 74ha and the entire basin go under irrigated boro rice cultivation. In addition to the professional fishers many people do fishing in the beel at subsistence level. There are six villages around the beel of which three are the main users of land and water resources of the Charan Beel area. The DFID assisted CBFM-2 (Community-based Fisheries Management Project Phase 2) project is under implementation in this site through a partnership of WorldFish Center, the Department of Fisheries (DoF) of Government of Bangladesh and CNRS (Center for Natural Resource Studies) since 2002. This site was selected for piloting the IFM options as a collaborative project with the WFC and DoF and CNRS took the lead role of implementation.

2.2 Survey Villages and Households

The study was designed to assess the KAP of the selected communities of Charan Beel in both the pre- and post- project situation. Two villages in the area, Badda and Ag Charan, were selected for survey, as these are located close to the beel and the villagers there are highly dependant on the beel for their livelihoods. These villages are also targeted by the CBFM-2 project for carrying out fisheries management activities. And, whilst they were initially the practitioners, they also happened to be drivers for further horizontal promotion of IFM in the area.

The KAP survey was done in two rounds; at the outset of the IFM project (R8306) in 2003 as a baseline, and post IFM, in September 2005. It is mentionable that a true baseline was not possible when the IFM project was launched at the field sites, due to the ongoing activities of CBFM-2 in the area (for nearly two years). However, CBFM-2 did not carry out any KAP survey, and the focus of CBFM-2 is largely on fisheries management.

There are different professional groups (fishers, farmers, labourers, traders) live in the villages. Possible differences between household categories, viz. fishers (who fish for consumption or profit or both) and non-fishers, were considered to determine the number of sample households. The household census output, which was previously done under CBFM-2, was used in this regard. The outlined numbers also met the considerations of the average recognized village-level sample size (practiced by CARE- Bangladesh), which is 30-35 samples from each village irrespective of the population. The sampling distribution is presented below:

To determine the size of the sample we have specified the margin of error “d” in the estimated mean x and a level of confidence 1-α (α is the level of significance);
n= 2Z.2P.Q/ 2d

Where,
Z = Abscissa of the standard normal curve that cuts off an area of α/2 on each tail
P = Probability fishers households
Q = 1-P = Probability of non-fisher households
n = Sample size.

d = Margin of error, 20% considered

The distribution of the sample unit, households of two villages under the survey, is as follows:

Number of Sample HHs			
	Badda	Agcharan	Total
Total No. of Households	464	333	797
Total No. of Fishers (Fishing for Eat, Sell, Eat & Sell)	337	178	515
Margin of Error, d, is 20%	0.2	0.2	
% of Fisher Household, P	0.726293	0.53453453	
Q	0.273707	0.46546546	
n = $(2z^2.P.Q)/d^2$ (Considered 10% Level of significance)	26.73347	33.4596145	
Total No. of households	28	33	61

	Badda	Agcharan	
Fisher households	20.34	17.64	
Non-fisher households	7.66	15.36	
Total No. of households	28	33	61

The distribution of fisher and non-fisher based on census data under CBFM-2 project			
Name of villages	Non-fisher	Fisher	Total
	No.	No.	
Badda	127	337	464
Agcharan	155	178	333
Over all	282	515	797

2.3 Survey Instrument

The questionnaire is composed of three interrelated sections, which are Knowledge, Attitude, and Practice relevant to IFM options. Verification of knowledge includes knowledge about floodplain ecosystems, livelihood linkages, pro-poor issues, and management practices. Whereas, the attitude and practice includes the locals own assessments, actions, and responses to any resource degradation, changes in state and behavioural changes in attitudes, communication, and resource management practices, respectively.

The responses were collected on a 5 point scale (strongly agree, agree, disagree, strongly disagree), and in true / false statements to measure attitude. In each section, both positive and negative statements were included to keep the respondents attention throughout the interview. In some places, the same question was placed more than once to check whether the respondents are responding without understanding the questions.

In developing and finalizing the questionnaire, a draft version was field tested at the Charan site (Appendix-1). After field-testing, some questions were changed, which the field staff said the respondents found confusing, and some others which were not relevant to changes due to project activity. The questionnaire was then revised incorporating the feedback from field-testing. The findings are as percentage distributions of responses against each statement.

3. Findings

3.1 Knowledge

3.1.1 Knowledge on fish and floodplain habitats

Soil erosion and the consequent siltation of wetlands is considered a major environmental problem, resulting in various environmental hazards and livelihood constraints. One of the key problems of floodplain resources in Bangladesh is habitat degradation due to raising of wetland beds, which turns perennial wetlands in to season ones and reduces wetland productivity, particularly affecting fisheries and aquatic biodiversity. However, when the respondents were asked to express their understanding as to whether soil erosion contribute to degradation of wetlands, 55% agreed with a statement saying there was no impact on wetlands (Figure 1). This is an area where the villagers need to be sensitised that soil erosion is one the environmental problems that negatively affect natural resources production.

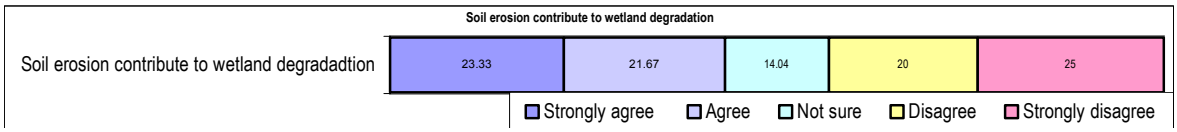


Figure 1: Communities knowledge on soil erosion and its impact on wetland habitats

Availability of large fish is now lower in many floodplain wetlands in the country, due to various reasons of which increased fishing effort and destructive fishing are the major cause for loss of multi year class fish. Most fish are caught before reaching year one, at the end of monsoon and thus many fish, that attain sexually mature in year 2 or year 3, are under serious threat of localized extinction. The respondents were asked whether they noticed large size fish in their area (Charan Beel as before) and the response found is frustrating: 100% said availability of large fish has decreased in their area (Figure 2).

Studies revealed that various development interventions (FCD/I projects and rural road net works) have altered hydrological regimes that disrupted water flow pattern and so the fish migration from river to floodplains. The communities also have similar observation as 85% of the respondents said avenue for fish migration from river to beel has decreased.

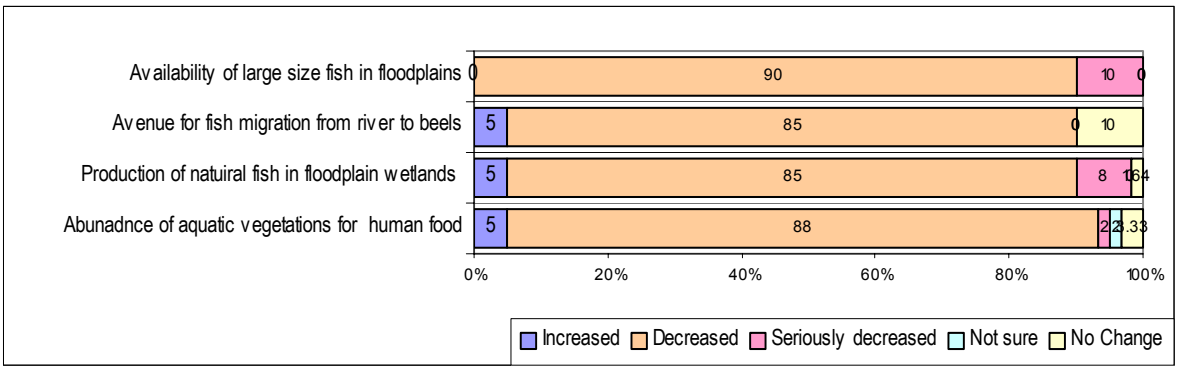


Figure 2: Knowledge on fish, fish migration and production trends

Knowledge on the production of natural fish and abundance of edible aquatic vegetation in floodplains reflected reduction as over 85% respondents supported that both the natural fish and aquatic vegetation have been decreased compared to what existed in the past.

Communities' knowledge on alteration of wetland habitats has been assessed during the pre-survey round. The study findings indicated that over 70% respondents think that it would be harmful if dykes were made around beels (Figure 3). However, 25% said it would be beneficial based on their understanding: that beels protected from floods can be used for fish culture thus production could be increased through stocking.

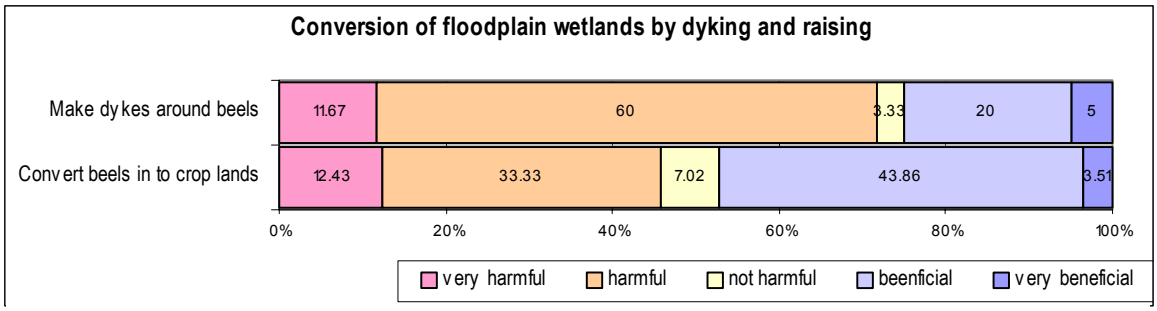
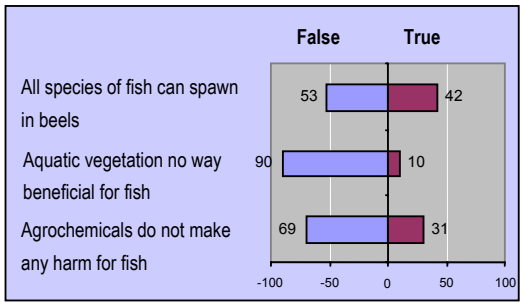


Figure 3: Knowledge on habitat alteration and its impact on fisheries

The communities' knowledge base on fisheries issues was assessed on some relevant statements viz. spawning habitats, aquatic vegetation, and their contribution to fish, and the effect of agrochemicals on fish. The species of fish we get in beels do not all spawn in the stagnant water of beels. The "white fish" (carps, some catfishes) prefer to live in riverine environments for most of their life cycle, while the fish that spend most of their life cycle in beel water and breed there are called "back fish". The "white fish" species that come to floodplain beels in monsoon for grazing and growth do not breed in beels, thus if river water does not enter in to beel we will not get them there. Responding to a statement "all species of fish can spawn in beels", 42% said true meaning their understanding is not correct (Figure 4).

Figure 4: Knowledge on fisheries issues



Communities' knowledge on the beneficial effects of aquatic vegetation on fish life is fairly good. As observed, majority of the respondents recognized the contribution and benefits of aquatic vegetation to fish life (90% gave the correct answer by saying false to the statement "vegetations no way beneficial for fish"). Over two thirds of the respondents expressed their understanding that agrochemicals applied in crop fields affect to fish in open waters.

Popular wisdom is that the local people, especially resources users, by virtue of their long involvement in practice, acquire an ample knowledge base on social and technical aspects of the resource systems with which they interact and subsist on. The KAP survey at community level strove to assess the knowledge and understanding of communities on floodplains management issues in general with regards to their observation and resources use pattern in the Charan Beel area. To this end, some key relevant statements were asked to respondents.

"Wetlands are wastelands" was the prevalent view among policy planners before the advert of flood action plans (FAPs) in early nineties, and the issue of loss of wetlands and the extent of destruction to natural and biological resources due to water control projects, was made more public. Communities, including the poor who largely depend on wetland resources, prefer paddy land to wetlands, given a choice. Although it is evident that wetlands are more valuable than rice paddies, preference of paddy/crop lands over wetlands might be due to insecurity of ownership and constraints in access arrangements to wetlands.

To this end, during pre-survey, respondents were asked to express opinion on the statement "wetlands are wastelands". More than half of the respondents (56%) disagreed with the statement, and thus evaluated wetlands as valuable, whilst 44% agreed with the statement by saying the statement is correct (Figure 5).

In the post survey round the respondents again expressed their understanding of wetlands as valuable even when given a choice that "paddy land is more important resource than wetlands". The feeling of the community on the issue still remain same as it was in the pre-survey round that 44% rated wetlands as important. However, it is important that more than half of the people in Charan Beel area conceptualised that crop lands are valuable but wetlands also provides lots of benefits that cannot be realized from crop lands.

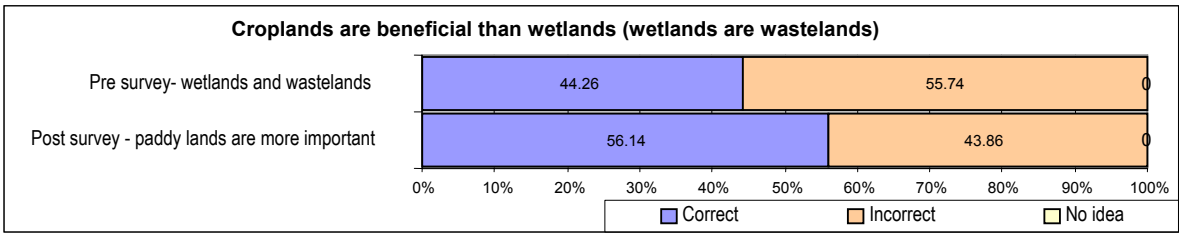


Figure 5: Knowledge on value of wetlands and croplands

3.1.2 Knowledge on resources and beneficiaries

Resources and benefits of wetlands that people use/derive over the seasons are not well documented and reported, thus benefits of wetlands are narrowly understood by all concerned, more so at the policy levels. Therefore, while planning development projects, wetland benefits are undermined.

Common understanding among at the policy and intermediary levels (as well as in communities) is that people only get crops and fish from wetlands, therefore fishers and farmers are the only targets. This understanding, on one hand, ignores the value of wetlands as multiple resource systems, whilst at the same time disregarding the livelihoods of a large section of the communities who are landless and poor, subsisting on various wetlands products. Interventions designed out of this understanding are accelerating the degradation of wetlands and affecting natural productivity, whilst increasing the level of rural poverty.

The findings of the KAP survey also indicate that the majority of communities have a similar understanding (that people only get fish and crops from wetlands). As shown in the figure below, about 80% of respondents said the statement was true in the pre- survey, whilst in the post- survey the understanding was slightly more clarified as the figure reduced to 54%. However, more than half of the community believe that fish and crops are the only products that people get from wetlands.

The findings, however, showed that people's understanding regarding the target beneficiaries of IFM is clearer, as more than half of the respondents (56%) said the statement that "fishers and landowning farmers are the only beneficiaries of floodplains" was incorrect, recognizing that other social and occupational groups are also stakeholders.

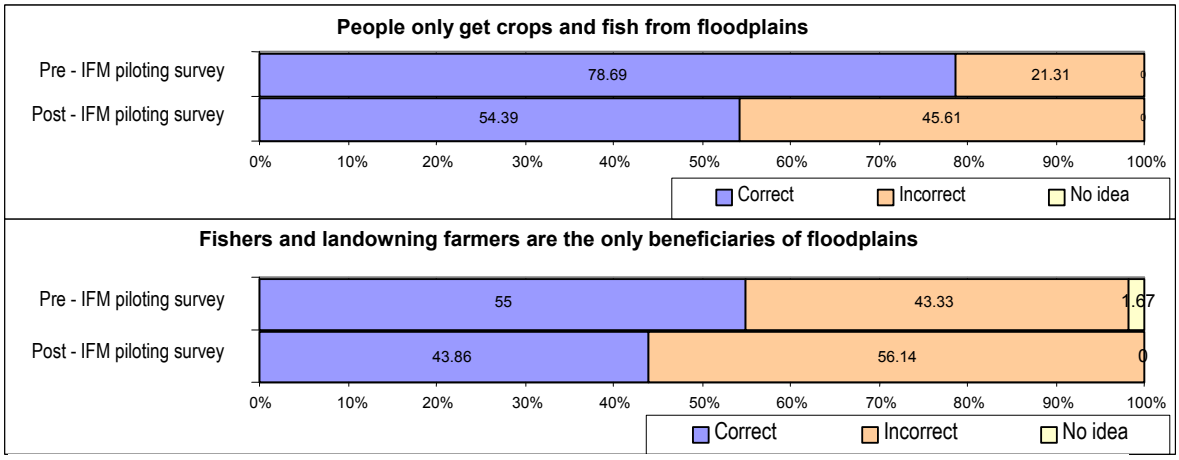


Figure 6: Resources and beneficiaries of floodplains

Responding to a negative statement, "we will get all species of fish in Charan Beel even if the river water does not enter the Beel", analysis of the responses of this statement, both at pre-IFM piloting and post- IFM, shows that the majority of the respondents answer correctly by putting tick in "incorrect" cell. In fact we will not get all species in Beel if river water not does enter (riverine fish will not enter) in to the Beel.

However, some enhancement of knowledge among the respondents was observed during the post-implementation survey on this issue as 86% did the correct answer compared to 77%

during the pre-IFM survey method (Figure 7). It is noted that some awareness of floodplain management issues already exists due to CBFM-2 project that has been running for four years in the area, but as the data implies, there are still 14% of respondent who are unclear as to fish spawning habitats.

Another negative statement, "Carps can breed in Beel water" (stagnant water) was asked. Varied responses were found during pre survey, where only 23% gave the correct answer by saying that the statement is incorrect, whilst in post-IFM survey more respondents gave the correct answer (53%). However, one third of respondents, after 2 year of IFM, are not sure whether carps breed in beel or not (note that carp always breed in flooded rivers- not in beels).

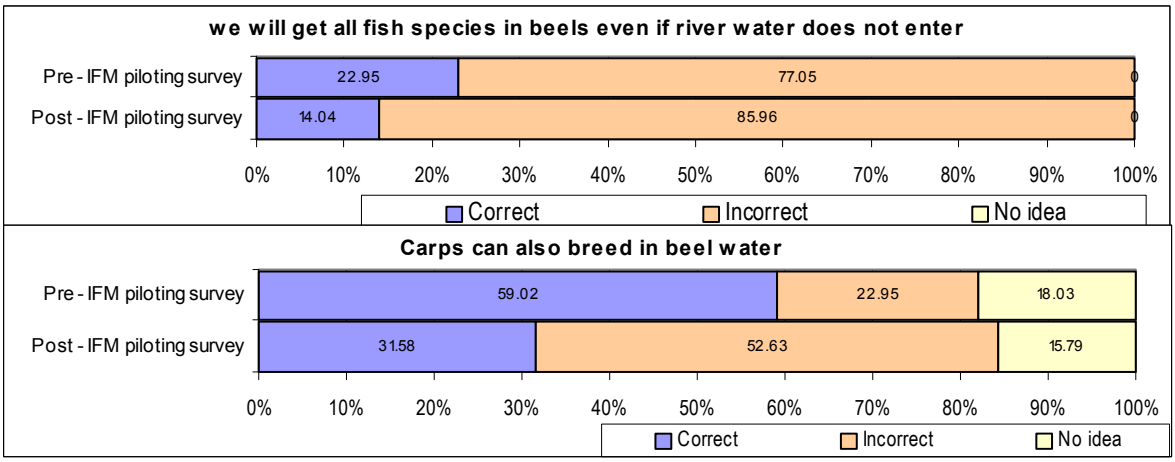


Figure 7: Knowledge on fish spawning habitats in floodplains

There are also some respondents, (16-18%) who have no idea on this issue, both pre- and post- survey. This indicates that training on some key technical fisheries issues (covering more people) may be worthwhile for the people to plan floodplain resources management interventions.

The general scenario all over the country gives the impression that Beel areas or the low-lying land in floodplains is suitable for growing boro rice in rabi season. Charan Beel is no exception. As observed in pre-IFM situation that nearly 100% beel basin in Charan site was under boro rice and this has been the practice for the last few years. Regarding the issues of boro cultivation, understanding of communities has been assessed by a statement that "boro is the only suitable crop for beel areas – as other crops are not possible there". In the pre survey, 59% supported this statement while 33% thought other crops may be possible by saying incorrect. 1.56% said no idea (Figure 8).

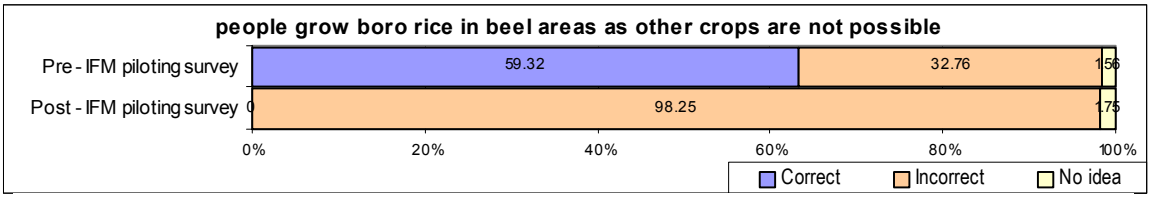


Figure 8: Knowledge on floodplain agriculture in rabi (dry) season

This situation changed dramatically in the post survey round as 98% believed (based on the observation and understanding) that rabi diversification out of boro is possible in Beel areas. This indicates the reflection of rabi diversification in Charan beel under the project and practical understanding of people generated out of piloting cropping pattern change in rabi season.

3.1.3 Knowledge on floodplains management issues

Although there are no longer any sluice gates at the Charan Beel site, people responded to the statement (Figure 9) based on their knowledge from past experience. A negative statement was served “sluice gates can not be operated for benefiting fish as these are built for crop protection only”. In pre-IFM survey, 50% respondents gave incorrect answer by saying agreeing with this statement. No major change is observed in post survey on this statement however as 50% said correct to this statement, although 11% did say they had no clear idea on this issue (Figure 11).

It is important to note that people need to have a clear idea of the issue of sluice gate management so that in future planning on sluice gate by the BWDB, if any, in Charan site, they can better contribute to make arrangements for fish friendly sluice gate operation. A recently completed FMSP study concluded that sluice gates could be used to enhance impact fisheries within modified floodplains.

There was a statement to judge the knowledge on dry season protection of fish to see whether people have good understanding of the issue. As can be seen that during pre survey 89% responded correctly to the statement that protection of fish in the dry season would increase fish in following year (note that during pre survey, although 11% said this is not correct, there was confusion about management timing for fish enhancement among at least a few people). After two year of IFM piloting (along with CBFM-2) 100% respondents at the post survey agreed that the statement was correct (Figure 9).

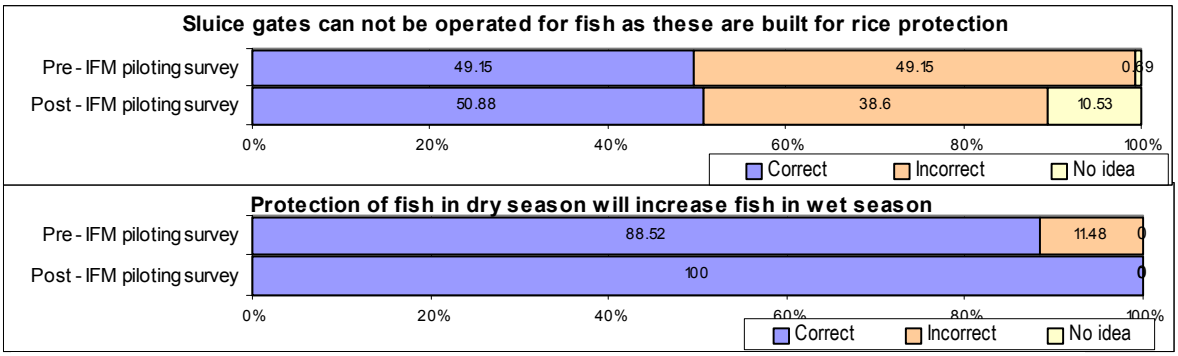


Figure 9: Knowledge on sluice gate and closed season for fisheries enhancement

Establishment of sanctuaries (closed area), whether permanent or seasonal, are said to be effective in enhancing fisheries production, particularly in places where fishing effort is very high. CBFM-2 along with the BMC established a sanctuary in Charan Beel in 2002-03 and people are aware of it. The pre survey was done after the establishment of the sanctuary. People’s assumption was optimistic at the initial stage of sanctuary establishment, with 90% of respondents saying that the “contribution of sanctuary on fish production enhancement would be very high”. In the post IFM survey, after they had observed sanctuary management and its benefits, they responded to the statement differently, with 74% saying impact of sanctuary is very high and 23% saying high (Figure 10).

In conclusion, the understanding of communities on the impact of sanctuary on fisheries enhancement is quite reasonable post-IFM. It confirms that benefits of sanctuaries are substantial as people’s understanding developed through observation of the real situation.

Regarding the understanding of the effects or contribution of effort control in enhancing the fisheries production, people's expectation was high. As observed during pre-IFM KAP survey that 90% of those who responded said the impact of effort control would be very high. This assumption was based on the notion that if there was total closure of gear operation for certain period (as planned CBFM-2 by the BMC), it would contribute to greater fish production. However, over the course fisheries management, effort control measures were enforced (are being enforced) but total closure (for all gear stopped) was not possible due to social and management constraints. Total closure may not be practical in a situation where many poor people fish at a subsistence level.

Therefore, it is quite logical that the people reflected the issue and in post KAP survey; 30% of respondents said the impact of effort control on fish enhancement is very high (as opposed to 90% in pre-KAP survey) while 51% said high at 19% said medium. People has varied observation on the effort control measures, however, all supported effort control as effective, and to an certain extent, enforceable means, beneficial to sustainable fisheries.

Observation and understanding of communities on rabi crop diversification (cropping pattern management option) has been found positive both in the pre-IFM survey as well as in post survey. However, post-IFM survey results reflected greater understanding on the issue. In pre survey, 32% said there would be no contribution of rabi diversification to floodplain fisheries enhancement while in post survey none supported that, rather all said there would be fisheries benefit if rabi crop diversification is in place due to saving of water (Figure 10). The survey findings show that 28% of respondents understanding were in favour of very high impact compared to none that said very high in pre survey.

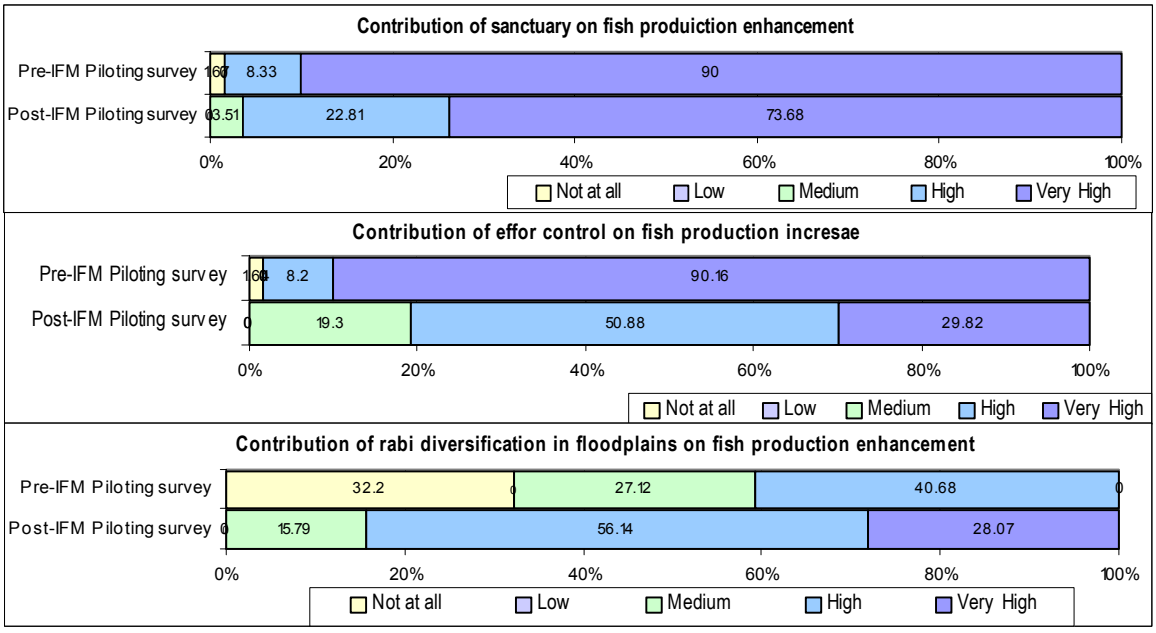


Figure 10: Knowledge on effort control and cropping pattern management

On the issue of disconnecting the floodplain beels from rivers (isolation of beels from rivers) and its impact on fish production, the majority was in favour of negative impact on natural fish production, to varying degrees, both at pre and post IFM survey rounds. In both the rounds, at least a few people said there would be no impact of losing connectivity (or flooding of beels) on

fish production (12% in pre survey and 4% in post survey). However, post survey, more than half of the respondents (54%) said that the impact on fish would be very high while only 23% in the pre survey said as such (Figure 11).

The issue of maintaining a brood stock of fish in floodplain/beels in the dry season is being increasingly recognized as an effective way of increasing the sustainability of fisheries; the IFM options emphasising the concept. However, there is different understanding on the issue among the communities, as some believe that fish are the gift of god and that they will get fish in floodplains anyway. Thus, some people differ with the idea of protecting fish in the dry season refuge so that the parent stock could repopulate the wetlands in next monsoon - rather their belief is that fish/eggs/fry come from rivers to floodplains anyway. However, apart from some respondents whose understanding did not support the statement that "harvesting all fish in the dry season will affect production next year" (18% in pre survey and 14% in post survey), over three quarters of the respondents said that the impact would be very high in the post-survey as opposed to 26% in pre survey.

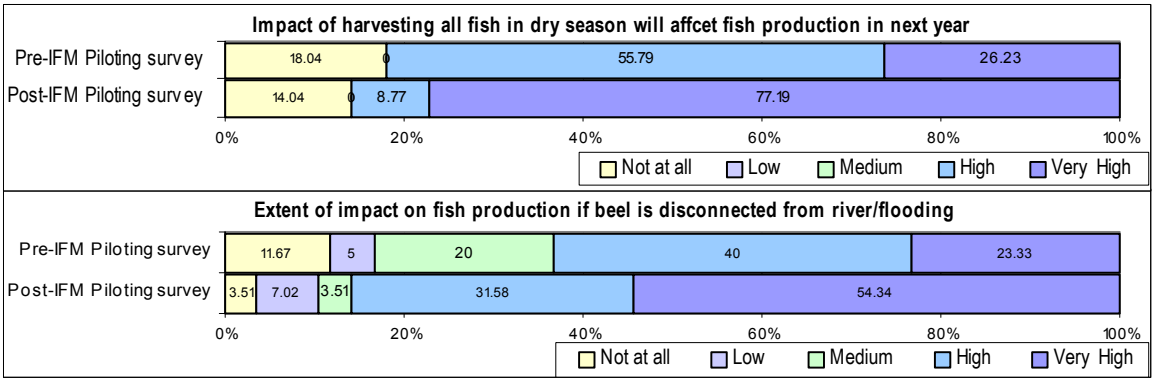


Figure 11: Knowledge on interventions on fish production

3.1.4 Knowledge on pro-poor issues in floodplains management

Regarding the issue of gender in floodplain management as a way of creating an enabling community environment, in favour of women's role in resource management, the present situation is favourable. Although, women's direct involvement in floodplain management is yet to gain momentum, the understanding of Charan Beel communities was found to be satisfactory. In the post survey round, 12% respondents felt women could no way contribute in IFM as opposed to 25% reflected in the pre survey round (Figure 12).

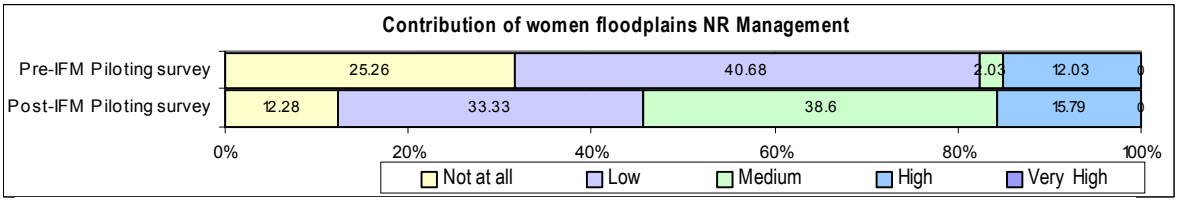


Figure 12: Knowledge on women involvement in floodplains management

None of the respondent said women's role is very high however, 39% post survey said that women contribution to IFM could be 'medium' as opposed to only 2% that said medium in the pre survey. This gives us some indications that understanding of communities around women's role and contribution in IFM is changing positively.

Understanding of communities on the extent of dependence of poor households on floodplain resource was in line with expectations. All recognized that the poor have greater reliance on floodplain resources for their livelihood and reflected their opinion in both pre and post survey rounds. However, in post survey 56% expressed their opinion that the poor dependence on floodplains is very high while only 13% said very high in pre survey round (Figure 13).

Various campaigns and awareness meetings with communities about linkage between the poor, and natural resources, were highlighted, and IFM options visibly supported the pro-poor options, contributing to the enhancement of community understanding on the issue. This understanding will help the poor gain greater access to resources as well as help designing pro-poor management interventions, if CBFM-2 project can carry out its program in line of people's present understanding of pro-poor issues.

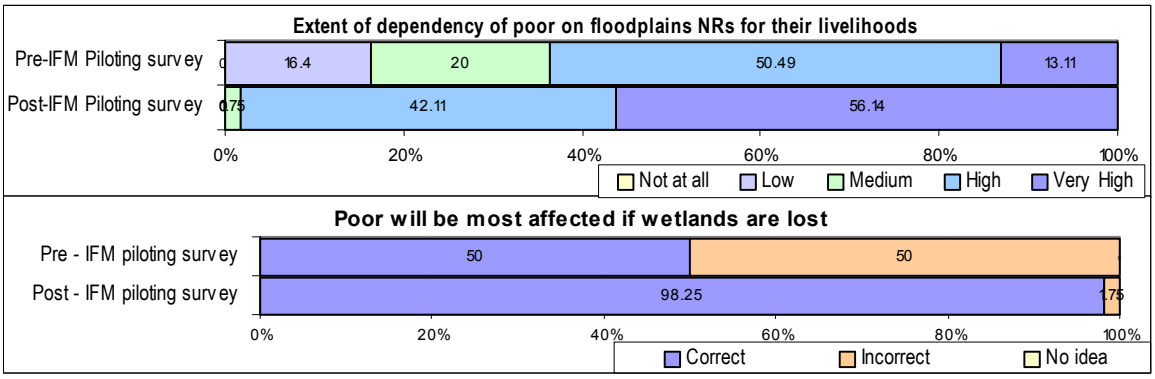


Figure 13: Knowledge on involvement of poor in floodplains

Floodplains as multiple resource systems provide wider opportunities for a range of people from various social and occupational categories to make their livelihoods through use and harvest of various resources. Historically, the poorer communities shape their livelihood strategies over the

season according to the availability of various resources in the floodplains, that also vary by seasons.

Though restricted in many cases, the poor, under various access arrangements, still managed to make avenues for them to get benefits from floodplains. For example, poor households in Charan Beel area have free access to fishing with small gears for subsistence almost all year round, while others, using larger gears have to pay a toll to the BMC.

To this end, the respondents were asked to express their opinion on the extent to which the poor will be affected if the wetlands are lost or degraded. Half of the respondents in the pre survey said that the poor would be most affected if wetlands were lost while in the post survey, 98% said the poor would be most affected considering their free access to livelihood dependence in the lean period when other jobs are scarce in the locality.

3.2 Attitudes

In the efforts of sustainable natural resource management, use of local knowledge and practices has been recognized as a key element for success. However, it is often observed that most developmental projects seldom consider the value of local knowledge and practices – it is more often the case that passive participation of communities in projects is considered 'community participation' and thereby, it is claimed that local knowledge has been given due consideration in development planning. The community, however, often emphasises the real problems and needs, but with the expectation that the project can take care of every problem. Thus, community expectation can be something beyond what is in practice, based on the problems and needs of current practices. To this end, a negative agreement/disagreement statement was surveyed and participants were asked to respond. The issue was importance of local knowledge and practice in IFM planning, and the majority of respondents supported the idea in both pre- and post- KAP survey rounds. However, pre survey 67% supported the idea, whilst post survey, 75% supported the idea of incorporation of local knowledge and practice in IFM practices (Figure 14). A few remained confused on the issue.

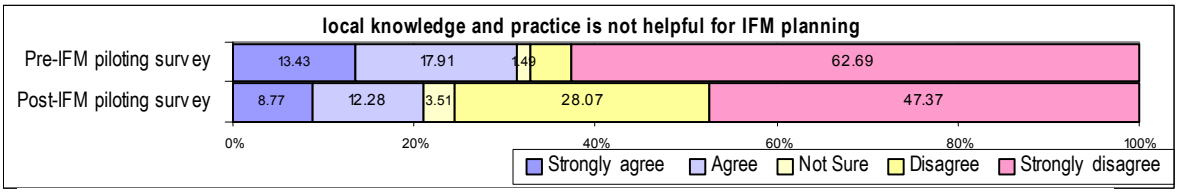


Figure 14: Attitude towards local knowledge on floodplain NRM

The idea of rabi crop diversification to minimize competing use of dry season water for boro rice and fish got more support from the community after the piloting of IFM in the site. The survey findings revealed that 95% of respondents' attitudes were positive towards balanced use of water for fish and crops and they agreed with a statement in support low irrigation demanded alternative rabi crops so that more water can be made available in beels. A positive attitude was also shown during pre survey when 72% agreed with the issue. However, this was more based on theory whereas the post survey response was based on experience in their locality.

On the issue of water management for the fish and crops, most of the respondents emphasized that water management is crucial in dry season when water level falls to its minimum, and at the same time, irrigation demand for boro rice is very high. The whole farming community tries, at any cost, to meet the irrigation requirement to ensure returns from rice.

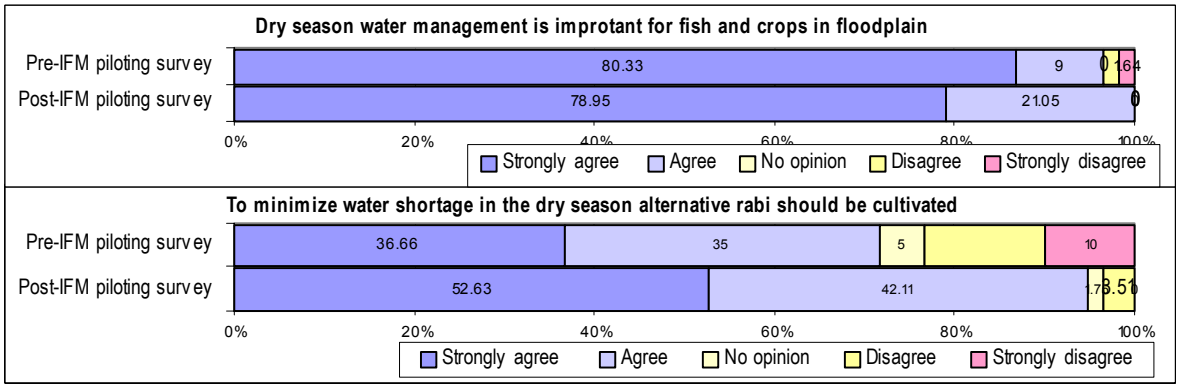


Figure 15: Attitude towards dry season water management in floodplains

Thus, fish become more vulnerable at that time when both the fishing mortality (due to low water level) and natural mortality are very high. In both survey rounds, most of the respondents supported balanced water management in the dry season as can be seen in Figure 15. Although a few (10%) disagreed or were confused with the issue in pre survey round, 100% agreed post survey (Figure 15).

Fish and crops are the main production commodities in the floodplains, on which the communities largely subsist. Fishing and farming are therefore, the major livelihood strategies of the people living around the floodplains. However, being owners of land and being placed at the upper social hierarchies, the farmers dominate the ways and means of use of floodplains as a whole where farming gets the priority and fishing is ignored. The conflicts among the users (fishermen and farmers) are a common social issue that can be seen widely.

IFM intends to focus on the issue and options recommended to minimize the conflict targeted to maximise joint benefits from fisheries and farming through integrated planning and management practice. To this end, attitudinal change among a range of resource areas is important.

A statement in support of giving equal importance to fish and crops under IFM was asked to assess attitudes. In pre survey, 50% showed a negative attitude to giving equal importance to fish and crop, while post survey, over 95% agreed with the issue. They reflected their attitudinal change positively favour of IFM and joint benefit through joint planning (Figure 16).

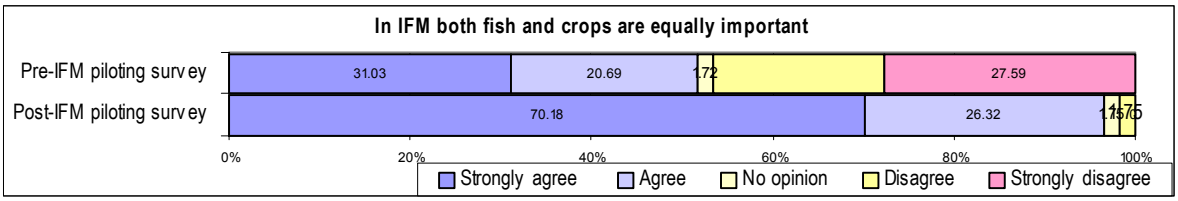


Figure: 16 Attitude towards priority in fish and crops in IFM

Boro rice cultivation is widespread in the locality in low laying basins (beel basin) of floodplain in rabi season. Being “water hungry”, to meet the irrigation demands, people abstract water from beels (also underground water by STWs), thus fish become vulnerable in the dry season. Keeping in mind the importance of fish and crops in floodplain production and in livelihood, income and nutrition, balanced water management is emphasised in IFM options.

Given the statement that “beel would be dewatered for boro cultivation”, respondents was asked their views, in light of the fact that this is the traditional use of beel water. In both the survey rounds, the attitude of majority was against dewatering beels for irrigation. To this end, compared to pre survey round, positive attitude of more people was observed on the issue as 75% in post survey showed disagreement to widespread beel dewatering compared to 61% pre survey (Figure 17). Thus can be assumed that peoples attitude after IFM piloting in the area, is changing towards rational use of scarce dry season water that support IFM concept.

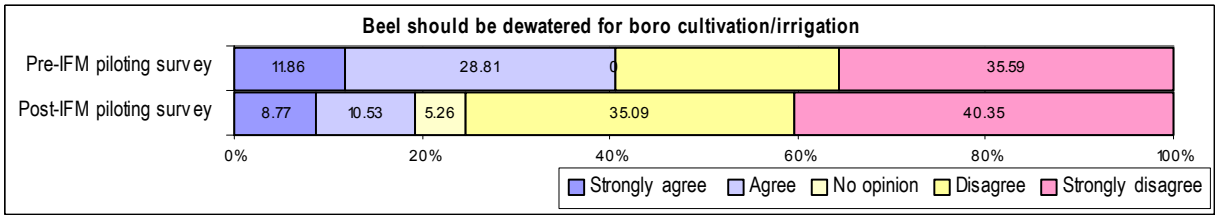
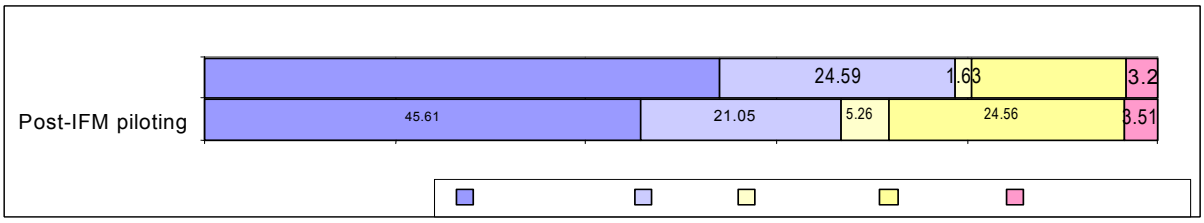


Figure 17: Attitude towards beel dewatering for boro cultivation

During the course of IFM piloting and promotion, a general reluctance was observed among the communities, as well as secondary stakeholders, on land retirement option. People tend to cultivate crops on all land available under any circumstances; even the land is highly susceptible to flooding. Therefore, IFM piloting could not make any progress on land retirement. However, in theory, people support the idea, but said that the government should enforce laws or set conditions with the leaseholders and farmers. This would be a complex way of doing this and may not be achievable at all locations.

The KAP survey revealed interesting feedback, in that, theoretically, the majority of the respondents showed positive attitude to this option (79% in pre survey and 67% in post survey) although it was not workable during the IFM piloting (Figure 18). That more people agreed in the survey might be due to the fact the project is doing survey for the sake of data collection rather than implementation. The other reason is that who do not cultivate (or do not have land in very low lands- good for retirement) supported the options.



In assessing the attitude of respondents regarding stakeholder involvement it was found that majority of the respondents (55%) in the pre survey disagree and 3% did not give any opinion. While in the post survey, nearly all respondents (97%) showed positive attitude towards access to resources by all concerned groups for management and use of floodplain natural resources (Figure 19).

The respondents also showed very positive attitude towards reaching the poor through IFM, with the majority of respondents in both the pre and post survey agreeing that the IFM policy should target the poor. Thus 85% and 93% disagreed with the statement that IFM policy should target the rich as they own most of the land in floodplains (Figure 19). Through this attitude, it can be said that they recognized that floodplains are common pool resources (CPRs) being used by multiple stakeholders and their role in planning, management and use should be maintained.

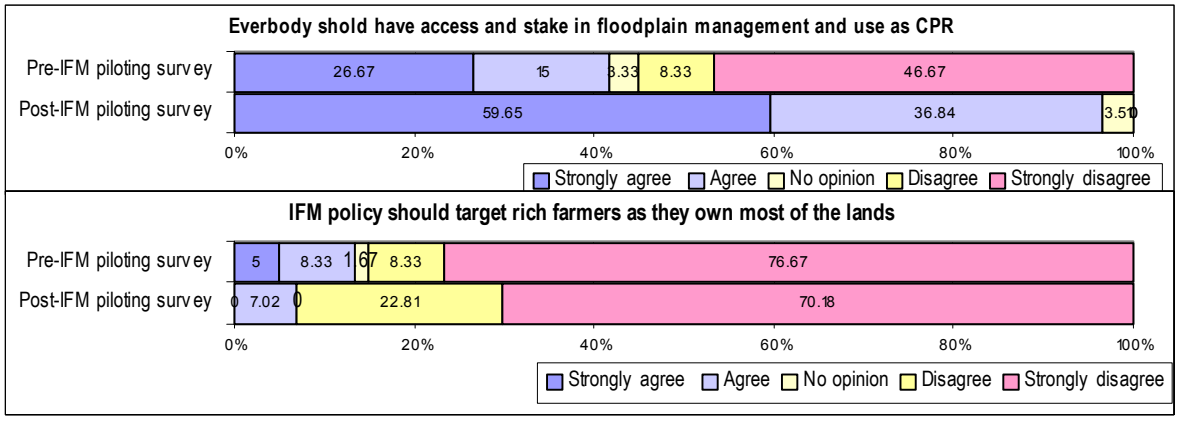


Figure 19: Attitude towards access to floodplains by the poor and rich

Floodplain fisheries management is largely considered a male focussed intervention, mainly because the nature of management involves harvesting of resources and women's roles are traditionally subsidiary (net making, repairing and so forth). Women participating in floodplains (fisheries) management are generally treated negatively, in light of prevailing socio-cultural norms & systems.

The IFM, however, is not only meant for the fisheries management but also to emphasise other components of floodplains, with a key focus on water management, which supports the whole production system. IFM adequately consider the seasonality dimensions of the floodplains and changing resource use patterns, based on land and water use over the dry and wet seasons, and with different user groups. There are opportunities in IFM for wider and greater participation of women in planning, implementation, and monitoring of IFM options, particularly in the dry season, when cropping pattern and beel water usage are crucial issues.

The stakeholders' knowledge assessment part of this report reflected the feeling that women's contribution and involvement in IFM is much lower than men's. However, some positive changes in knowledge and attitudes have been visible among the communities regarding the increased role of women in IFM. This might be due to regular interaction with both the male and females members at various events over the course of IFM piloting (as well as due to CBFM-2 activities).

The positive changes in attitude regarding women's role in IFM can seen in the responses of the communities on a negative statement that said "women have no stake in floodplains management and use as CPR" base. In the pre-survey round, 20% showed positive attitude disagreeing (disagree/strongly disagree) with the statement, however, the majority did not recognize (or did not feel comfortable with) the issue of women's role in IFM. In the post survey, after about two years, more than half the respondents (58%) showed a positive attitude to the issue (Figure 20).

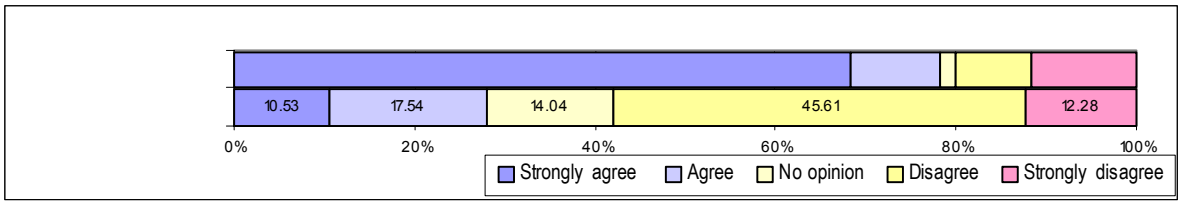


Figure 20: Attitude towards women involvement in floodplain management and use

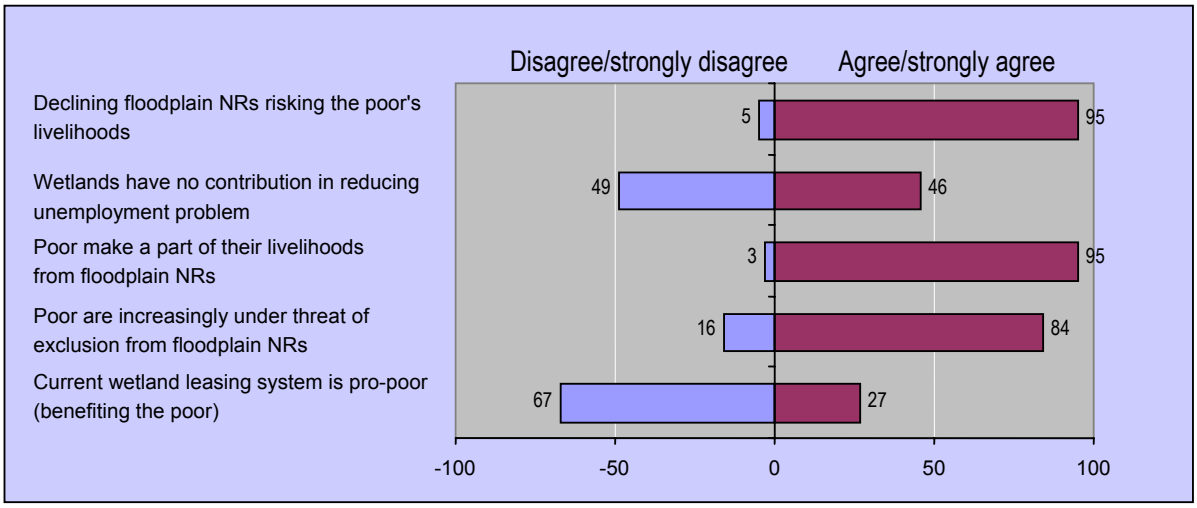
The integrated management nature of IFM dealing with fish, crops, water and thus addressing the overall livelihoods issue (as opposed to traditional fish or crop issue) created opportunities for interaction between the various occupational groups as well as male and female members from within the communities.

In order to assess the attitude of Charan Beel communities on pro-poor outcomes they were asked to respond to some relevant statements. Being recognised the fact that poor are more dependent on natural resources whilst the natural resource bases are increasingly under threat resulting rapid depletion of resources making the livelihood of poor more insecure. The respondents also support the present trend, and agree that declining natural resources putting the poor livelihood in risks and uncertainty: as observed 95 of respondents agreed with the statement (Figure 21). Although people recognize the value of floodplain wetlands as means of pro-poor livelihoods out comes, however, a good number still failed to realize the fact that wetlands offer a wide range of opportunities for the poor and unemployed to subsist on various

resources over the seasons. It is largely due to the way they look on to it, fishing and collecting resources to supplement family income is often considered as wage less engagement in employment and thus 46% respondents agreed that wetland have no contribution in reducing unemployment problem. However, 49% disagreed to the statement and supported that the wetland is creating job opportunities for the unemployed. It is seen in the figure that 95% respondent agreed to the statement that poor make a part of their livelihoods from wide range of natural resources from floodplains.

The issue of access to floodplain resources by the poor is at risk. In many areas of the country, access to fishing and use of resources are constrained due to formal leasing system (in case of *khas* lands) as well as in private floodplains. Local influential people (non-fishers and farmers) are increasingly enforcing various conditions on the poor to gain access to resources, thus the poor are at risk of being excluded. Majority of the respondents (84%) agreed with this, that poor are under the risk of being excluded from their traditional and customary rights of access to natural resources.

Figure 21: Attitude of communities relevant to floodplains and pro-poor outcomes



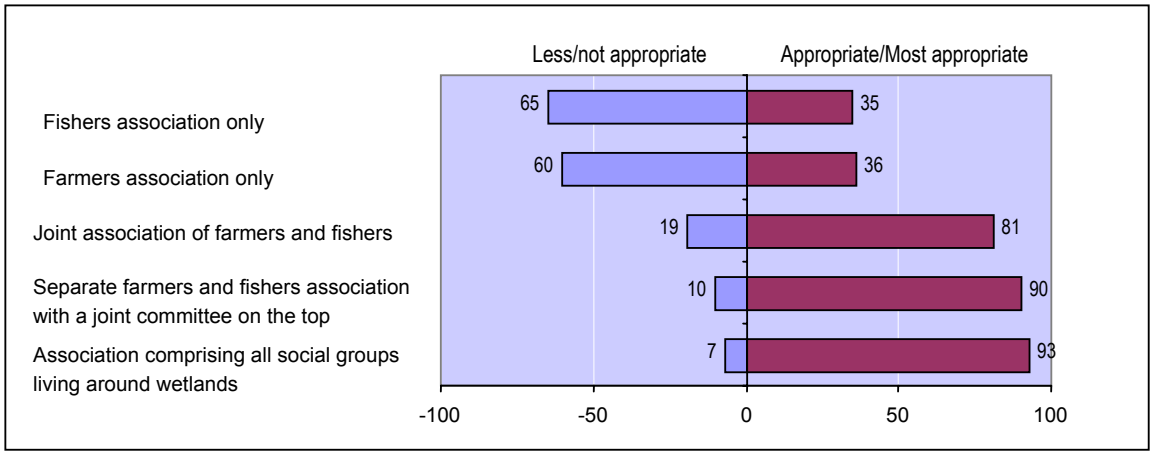
The formal leasing of *khas* wetlands (*jalmohals*) is said to be pro-poor as the system, in theory, emphasised that poor fishers associations would get priority in leasing the *jalmohals.* In practice, it is the non-poor and rich who managed to get the leases of lucrative and productive *jalmohals*, and the fishing management of Charan Beel was even under the control of local influential non-fishers before CBFM-2 was initiated. The majority of the respondents thus disagreed with the statement that the current leasing policy is pro-poor based on their observation in the locality (Figure 21).

It is important and essential that the IFM practices should be management, governed, and coordinated, through an institutional set-up and arrangements at the local level. To this end, CBFM2 project organized fishers in to beel management committees (BMCs) comprising of representatives of fisher households within the area of floodplain management unit. The BMC is basically a fishers association and their activities are largely or exclusively deal with fisheries management issues. Cropping pattern and water management, which has a strong link with the fisheries management, is thus remaining partially ignored. The issue was raised by the farming communities at the out set of IFM piloting at the site level and the project team facilitated the

farmers in forming an IFM committee to take care of crop and water management in close coordination with the already existing and functioning BMC.

However, during the pre-survey round respondents were asked to express their opinion on the type of local organization that could best manage IFM, and ensure its sustainability after the project is over. Of the various options for local institutions upon which their opinion was sought, the most preferred option was the formation of a local institution, taking representatives from all social groups in the community using floodplains resources: as can be seen 93% preferred this institutional option of the sustainable IFM options in practice (Figure 22). The next most preferred option (90% preferred) was separate fishers and farmers association but it was opined that there should be a joint executive committee to administer the day-to-day activities of IFM at the field. Having a joint association of fishers and farmers was the third most preferred option for IFM institution at grass roots level. Exclusive institutions, comprising of either the fishers or the farmers, were the least preferred option as per the responses of the majority of respondents on the issue.

Figure 22: Attitude of communities on appropriateness of IFM institutional forms



Currently there are two separate associations are in existence for management of Charan Beel resources. The BMC is formed under the CBFM-2 project and it is the fishers association managing the fisheries issues and the IFM committee formed under the IFM promotion project (R8306) dealing with more with cropping pattern and water management issues. Now it is important that a joint top-level coordination committee be formed, taking representatives from BMC and IFM committee for taking up the whole management issues of the site under their joint action programme. This option is suggested by 90% of the respondents during the survey (Figure 22).

3.3 Practice

Practice of any technology or option, and related social and institutional functions and processes, can be best assessed when these are observed at the field level. For example, whether, and to what extent, the communities are practicing IFM options at the floodplain level can be better judged through observing relevant activities and results in the area of operation.

Being a CBFM-2 site with CNRS as the implementing agency, the activities at the site-level under the project are known. CBFM-2 activities cover the fisheries management part of the IFM and thus "practices" relevant to fisheries management (effort control) were already in place (and are ongoing). The BMC (Beel Management Committee) organized by the project enforced fishing effort control measures (closed area and closed season), which most of the community members, as well as secondary stakeholders, are well aware of. Other IFM options such as cropping pattern management, land retirement were not within the scope of the CBFM project, and there were no such activities initiated by the community. Therefore, the KAP survey's emphasis was more on current practice on communities' communications at the local level with different stakeholders in relation to floodplains management rather the extent to which IFM options are in practice there.

To this end, some statements were given on sharing ideas, problems, and issues with range of stakeholders, as to the extent or frequency of interactions in the form of "not at all, irregular, not known, regular, and very regular". The findings revealed that communities, to some extent, maintain communications among diverse stakeholders relevant to fisheries and agricultural issues (Figure 23).

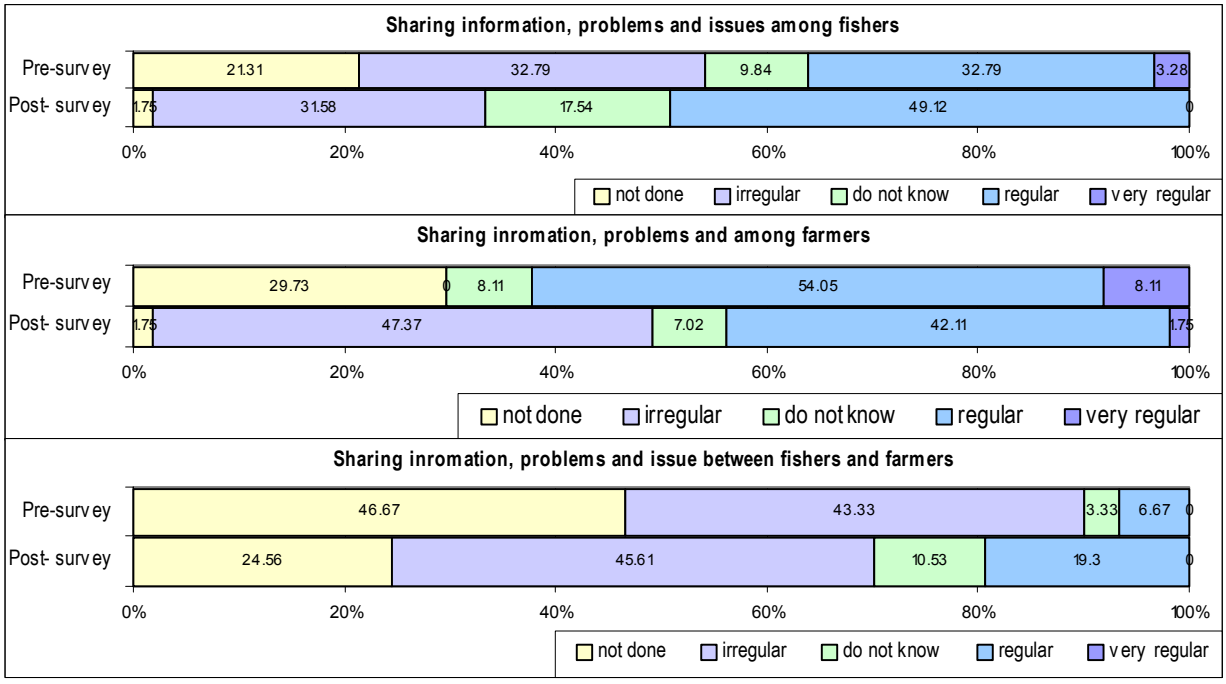


Figure 23: Commonalities communication among fishers and farmers

The graph below shows that in the pre-IFM situation, communication between fishers on their common issues was in place, whether regular or irregular. However, 21% respondents said there was no communication among fishers on common issues, which reduced to 2% in the

post survey, indicating that there have been more interactions among the fishers after IFM project in place (although 18% said they are not aware of such communication).

Similarly, communications among farmers were also in practice in the pre-IFM situation. However, the extent of interactions increased substantially in post IFM, and as can be seen, only 2% said that communication did not take place post survey compared to 30% before IFM was implemented at the field level (Figure 23).

Interaction between the fishers and farmers on floodplains management issues was poor in the pre IFM situation. Data shows that 47% of the respondents said that, to their knowledge, no activity for sharing common issues between fishers and farmers took place, and that whatever interaction was held, was irregular. However, the situation improved at IFM period when the number of responses saying, “not done” reduced by 50% compared to that of pre survey period.

Relation and interactions between the DAE Block Supervisors and communities (especially farmers) was always better than ‘farmer to farmer’ and ‘farmers to fishers’ interactions. This relation and interactions improved a bit during the IFM period as seen below. As reported, communities’ relationship and interaction with the Upazila Fisheries Officer (UFO) of the DoF has improved. 35% during the pre survey said no interaction took place, while only 14% said so in the post survey round (Figure 24). This may be because the project facilitated the process of interactions between the communities and local government officials on various occasions and issues (training, awareness, planning, visits, conflict management, trial) relevant to IFM piloting.

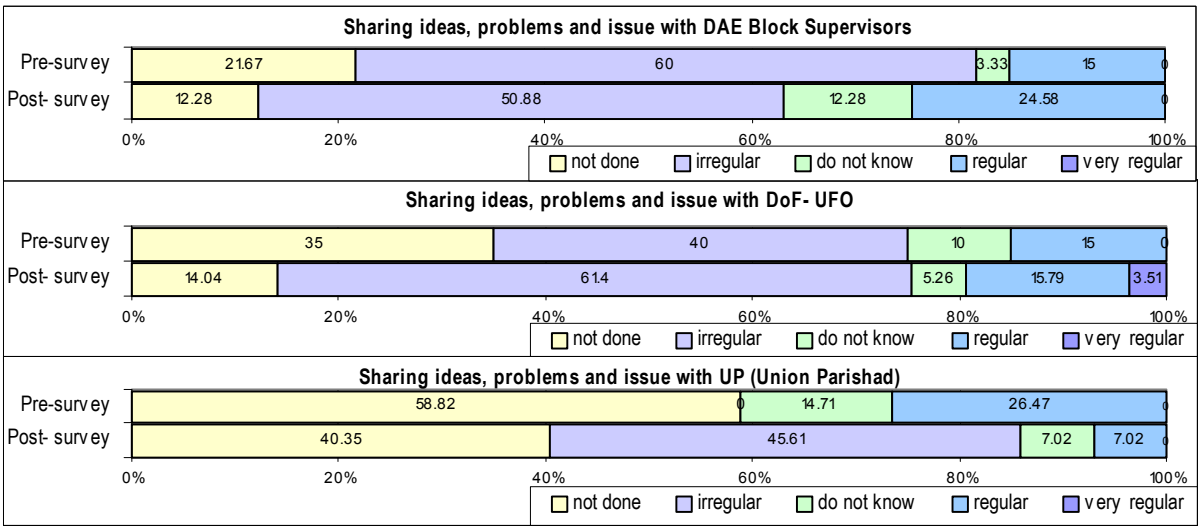


Figure 24: Communities communication with secondary stakeholders

Although local government bodies (UPs – Union Parishads) are very important, as they are the only grass roots elected bodies for local development, UPs involvement in development activities is mostly focused on infrastructure and conflict resolution. The communities’ needs in fisheries and crop management are thus low priority. However, there are issues in fisheries and crop management where UPs can better facilitate, and thus maintaining communication with them is necessary, at least at some regular intervals. Although the post IFM situation showed improved interaction with Ups (Figure 24), it is emphasized that there is need for further improvement in this area as, if they are convinced, could play a very vital role in facilitating wider promotion of new technology that is suitable for the area.

3.4 The Charan Beel Experience

The communities recognised that alternative rabi crops are more profitable than boro rice, when comparing the ratio of profit to investment. Based on the piloting experience of rabi diversification in Charan Beel in 2004-05 the respondents were asked to express their opinion. Their responses show that the majority (86%) said that alternative rabi crops (potato, maize, wheat) are more profitable than boro rice. The respondents also recognized that farmers could make even more profit if they grow another crop after harvesting alternative rabi crops (after harvesting potato by early April they have enough time to grow jute or vegetables before flooding starts in July).

Under the CBFM-2 project, the BMC, along with communities, set out some fishing effort control measures including: closed season in early monsoon from mid-April to mid-July, restricted use of mono-filament gill nets (current jal), and maintaining a year round sanctuary in the perennial part of the beel. These measures have been put in place over the last three years, starting in 2002-03.

The local people, who fish in the beel are aware of these effort control measures. In order to get feedback from the communities, based on their observation and perceptions of the effects of these measures, two statements were made in the post survey round. Regarding the extent of benefits they observed from the closed season, all the respondents said that the measures produced benefits in terms of increased fish production. Data shows that 28% of the respondents said that the benefit due to effort control was very high, 53% said high and the rest said medium to low (Figure 25). Regarding the establishing a fish sanctuary in the beel, respondents also showed positive observation as nearly 50% said impact of sanctuary is very high, 39% rated the benefit as high, whilst the rest said medium.

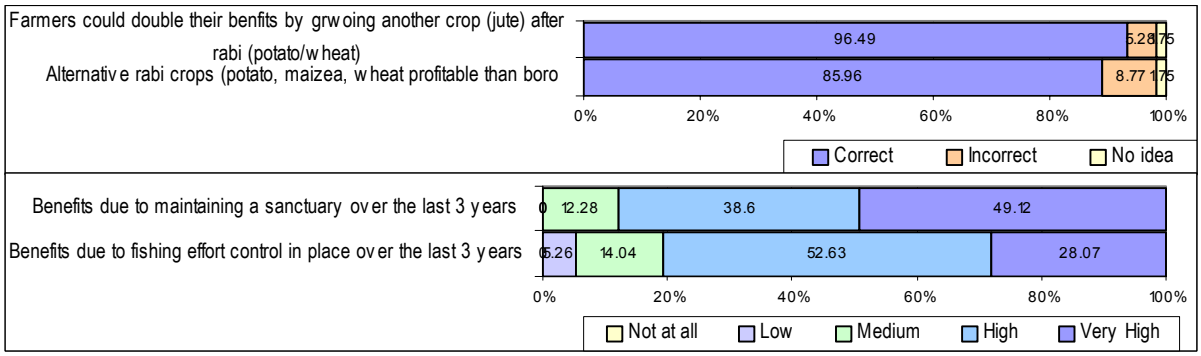


Figure 25: Perception on benefits due to cropping pattern change in Charan Beel under IFM

Figure 26 shows that communities feeling of ownership and understanding of practicing IFM options is stronger. Through their own association (IFM committee and BMC) by taking collective responsibility and self driven initiative to ensure joint benefits of fish and crops ensuring better utilization of land and water resources is crucial for the sustainability of the technology (here it is IFM options).

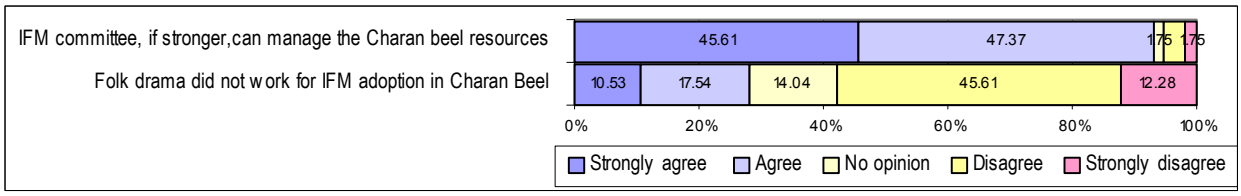


Figure 26: Perception on IFM committee and effectiveness of folk drama on IFM

4. Conclusions

It is now increasingly emphasised from all quarters that all relevant stakeholders should participate in planning, designing, implementing and monitoring of natural resources management programs or projects so that a “win-win” situation prevails, ensured through equitable distribution of benefits and protection of any group from exclusion. This is however, often very difficult to achieve and more complex in multiple resources systems where multiple stakeholder groups at different social & occupational hierarchies are involved as in the case of floodplains in Bangladesh. Because of this, educating the populous about natural resource management and making positive changes in their attitudes is vital.

It is clear that through IFM, the way the community views their resource base has changed for the better. They are now aware of, and keen to prevent degradation of habitats, and sustain the beel environment. However, whilst the IFM process has created a foundation on which the community can build, to realise the full extent of benefits, further facilitation may be necessary, in the form of technical support and to create linkages (with seed suppliers for example).

The overall effect of the interventions on knowledge has been positive, and more importantly, retained by the villagers. 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. Although on the many issues, the findings were surprisingly positive, it should be kept in mind that there is always going to be some gap between knowledge and practice, especially regarding cropping pattern management. The increased awareness of the role and needs of disadvantaged sectors of society is a positive indication for pro-poor NRM.

In terms of attitude adjustment, it can be 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. Even in the case of land retirement, unworkable in practice, it can be seen that there was a shift in attitude, recognising the need for intervention. The shift in attitudes to recognise the importance of fisheries ecosystems is vital to the sustainability of this resource base, and ultimately, attitudinal adjustment and community consensus are vital to the success of IFM, especially due to the limited timeframe in which NGOs tend to operate in a given project area.

For the benefit of the communities involved, however, it is important to sustain the momentum and pressure for changes in wetland usage. Although the focus of the KAP is the primary stakeholders, there are a number of permanent local-level institutions, whose involvement could ensure the continuing success and wider uptake (both horizontal and vertical) of IFM. Ultimately, it is these local and government institutions that will need to act as the engine for change in the use and conservation of natural resources, providing technical and social support, for the wider dissemination, and continuing success, of IFM.