

# Final Technical Report

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TITLE OF PROJECT	Promotion of FMSP guidelines for floodplain fisheries management and sluice gate control	
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## 1. Table of Contents

1.	Table of Contents .....	1
2.	Executive Summary .....	2
3.	Background .....	2
4.	Project Purpose.....	4
5.	Outputs .....	4
6.	Research Activities: .....	7
7.	Contribution of Outputs:.....	10
	7.1 Contribution to FMSP's purpose and outputs .....	10
	7.2 Impact of the project.....	10
	7.3 Further work .....	10
8.	Publications and other communications materials .....	11
9.	References cited in FTR Sections 1-7 .....	13
10.	Project Logframe.....	14
11.	Keywords .....	17
12.	Acronyms and Abbreviations .....	17
13.	Annexes .....	18
	<b>Annex 1. Outreach materials produced .....</b>	<b>18</b>
	Annex 1.1 Leaflets .....	18
	Annex 1.2 PowerPoint presentations.....	19
	Annex 1.3 Bill boards .....	21
	Annex 1.4 Posters.....	23
	Annex 1.5 Management Guidelines .....	25
	Annex 1.6 Newsletter Articles etc.....	37
	Annex 1.7 Policy Brief, prepared for DFID in 'id21' format.....	39
	<b>Annex 2. Bangladesh promotional activities.....</b>	<b>46</b>
	Annex 2.1 BCAS/FMSP stall at Bangladesh DOF Fish Fortnight Fair.....	46
	Annex 2.2 FMSP Sponsored Seminar at Bangladesh DOF Fish Fortnight .....	52
	Annex 2.3 Pot song performances .....	63

Annex 2.4 Theatre performances .....	66
<b>Annex 3. Bangladesh project inception workshop .....</b>	<b>74</b>
Inception Workshop Programme .....	75
List of participants .....	77
<b>Annex 4. Project Communications Matrix (as updated at Inception Workshop) .....</b>	<b>79</b>
<b>Annex 5. India dissemination workshop (Activity 2.2).....</b>	<b>84</b>
Workshop programme .....	85
List of Participants .....	86
Impacts on Knowledge and Attitude .....	87
Local follow up by collaborators.....	94
<b>Annex 6. Bangladesh Knowledge, Attitude and Practices (KAP) Report .....</b>	<b>97</b>
1. Introduction .....	97
2. Survey Methodology.....	97
3. Findings .....	98
4. Conclusion .....	112

## 2. Executive Summary

This project promoted FMSP-developed materials guiding the integrated management of floodplain fisheries resources, taking into account key factors such as establishment of sanctuaries, management of sluice gates to benefit both rice and fish, and climate change impacts. The project targeted both local managers in Bangladesh, e.g. sluice gate managers and fisheries officers, and national, regional and international policy makers in the South and South east Asian region (especially West Bengal, India). Many of these stakeholders still see floodplain management in purely sectoral terms although the new Bangladesh fisheries strategy now includes many of the FMSP floodplain fishery management recommendations. New materials produced by the project include leaflets, PowerPoint presentations, posters, bill boards, articles in newspapers and newsletters, a field manager's guide, a DFID policy brief and web pages with key messages and download facilities (especially the project page on the FMSP site). Existing knowledge and these new materials were promoted using a range of different communication channels, as appropriate to different stakeholder groups, including workshops, seminars, presentations at informal meetings, a stall at the Bangladesh Fish Fair, pot songs and street theatre. These materials and activities were developed with the Bangladesh partners, BCAS and CNRS, developing them as regional centers of excellence on FMSP and related DFID knowledge on floodplain fisheries. The project has contributed to the FMSP purpose by developing capacity for improved, integrated knowledge of floodplain river fisheries, enabling downstream benefits for poor people, especially in the target areas of Bangladesh and West Bengal, and the wider Asian region.

## 3. Background

Fisheries contributed about 6% of the GDP for Bangladesh in 2000 and 12% of export earnings, and employs about 9% of the labour force. In 2003, total fish production was 1.78 million tons. Inland fisheries and aquaculture contributed 53% and 24% respectively to the annual fish production totals in Bangladesh in the late 1990s, although the contribution made by culture fisheries has since increased.

Fisheries in Bangladesh include inland open waters, inland closed waters (aquaculture), and marine fisheries. All are an important source of animal protein, income, foreign exchange earnings and employment generation (Alam and Thomson 2001). The importance of

floodplain fisheries is often neglected in development activities. This is despite the fact that much of the population engages in floodplain fishing for livelihood purposes, or for household consumption and good health from animal protein. The Bangladesh Department of Fisheries (DOF, 1990) state that about 73% of households were engaged in subsistence floodplain fishing in 1987-88. Many people are also involved in fisheries related activities such as making fishing gear and fishing crafts, fish marketing, processing and transportation etc. BBS (2000) estimate that over 70% of all animal protein consumed in Bangladesh is from fish, and de Graaf *et al.* (2001) estimate this figure to be 60%.

Results of various studies carried out on inland fish production in relation to flood control, drainage and irrigation projects indicate that fish catches are declining in inland water bodies (Ahmad *et al.* 1997; MPO 1987; FAP-17 1995; de Graaf *et al.* 1999, Halls *et al.* 1999). Hoque (1995) also points out that fish diversity is decreasing. Reasons for this decline in fish biomass and diversity include the construction of flood control projects, pesticide use, industrial pollution and water withdrawal for irrigation (Halls *et al.* 1998; World Bank 1990). In spite of the conclusions of these studies, statistics published by the Department of Fisheries of Bangladesh suggest that in many areas, landings are increasing significantly (Craig *et al.* 2004).

Outputs from the FMSP cluster of floodplain fisheries projects and other research provide suggestions on how to increase inland fish production. Sanctuaries are known to enhance floodplain fish stocks, and improved sluice gate management could also enhance fisheries production in flood control systems. Sluice gates and embankments are known to block fish migration and dispersal routes and reduce wetland areas (Hoggarth *et al.* 1999; Mirza and Ericksen 1996; Sultana and Thompson 1997; Khan *et al.* 1994; Ahmad *et al.* 1997; Nishat 1993; Rahman and Huq 1994). Larval release experiments show that 25% of all hatchlings passing the Jugini regulator in Tangail, died because of this passage (Marttin and de Graaf 2002; de Graaf *et al.* 2001). The DFID FAP 17 project confirmed that fish catches within compartments were mostly small floodplain resident species ('black fish') rather than larger riverine species ('white fish'), which previously constituted most fish catches on unmodified floodplains (Halls *et al.* 1998). Every year, major carp and other white fish migrate upstream to spawn in the early floods. Juveniles and adult fish also migrate passively onto the floodplain with the flooding waters to feed and spawn (Welcomme and Halls 2001; 2004; Hoggarth *et al.* 1999; Halls 2005). Whilst sluice gates provide these passively migrating fish with access to modified floodplains, their operation is often geared to meet the needs of the agricultural sector. Sluice gates are often managed by Sluice Gate Committees. Recent work under FMSP project R8210 suggests that stakeholders are willing to open sluice gates early in the flood season in an attempt to improve fisheries production and biodiversity inside flood control compartments. The project provided guidelines on how to facilitate this.

Improved management of existing sluice gates therefore provides an opportunity to increase floodplain fish stocks at no (or minimal) cost to rice farmers. These farmers may however be farming very marginal (low-cost), flood-prone land. Ensuring these individuals are represented on such a committee is therefore important from a poverty perspective.

As well as negotiating obstacles to their spawning and feeding migrations, fish populations that reside on the floodplain during the dry season in residual water bodies are further threatened by irrigation activities to support the increasing emphasis on dry-season irrigated rice production. NRSP's project R7868 on integrated floodplain management found that beyond some threshold, these irrigation activities have a significant impact on fisheries yield (Shanker *et al.*, in press and 2004, based upon simulations described by Halls *et al.* (2001). These workers propose a strategy of integrated floodplain management to improve production from both the agriculture and fisheries sectors. This includes changes to cropping patterns, diversification of dry season crops, early and ebb flood sluice gate management practices and retirement of marginal low-lying land.

The FMSP floodplain fisheries project cluster has produced a considerable amount of new knowledge concerning such production issues on floodplains. The management strategies and guidelines from the earlier projects have been summarized and widely disseminated to worldwide fisheries stakeholders via FAO Fisheries Technical Report 384 (Hoggarth *et al.* 1999) and other publications (e.g. Halls and Welcomme, 2004; Halls *et al.*, 2000). More recent knowledge from project R8210 has already been taken up by the Bangladesh Water Development Board.

*For references, see Section 9 below*

## **4. Project Purpose**

The project purpose was the '*Promotion of FMSP and other DFID-developed materials to policy makers and field-level resource managers, to improve or sustain the integrated management of floodplain fisheries resources important to the livelihoods of the poor, taking into account key factors such as establishment of sanctuaries, effective sluice gate control and climate change impacts*'.

The project aimed to change management policies and practices for floodplain fishery resources, specifically promoting FMSP knowledge on the integrated management of fisheries, including harvest reserves and fish-friendly management of sluice gates in FCDI schemes. Awareness on the benefit of such management measures is now increasing in Bangladesh, and is included in the new open water capture fisheries strategy, but specific guidance on implementation strategies is still much needed at field levels.

## **5. Outputs**

The project outputs were defined as:

1. Existing knowledge on floodplain river fisheries management from FMSP and other sources packaged and actively promoted to communication stakeholders in Bangladesh according to their identified needs, thereby developing the capacities of BCAS and CNRS as joint centers of excellence on integrated floodplain fisheries management in Bangladesh.
2. Awareness raised about FMSP and other knowledge on integrated floodplain resource management in target Mekong countries and wider Asian region outside project sites.
3. Impacts of project uptake promotion activities documented for a range of communication stakeholders.

In Bangladesh (Output 1) FMSP knowledge was packaged in a range of different media (see Annex 1) and promoted using a range of activities, as appropriate to different stakeholders (see Annex 2). Most of the requirements of the project's revised communications plan have now been met, along with some additional activities, as summarized in Table 1 below. The project's Bangladesh collaborators, BCAS and CNRS, have been involved in developing all of the materials produced by the project, and led all of the local promotional activities. They remain as joint centers of excellence on integrated fisheries management in Bangladesh, and now specifically on the knowledge produced by the FMSP floodplains cluster (and related work by NRSP and others).

At the regional level (Output 2), awareness was raised about the FMSP guidelines on floodplain fishery management by a two-day dissemination workshop in West Bengal. This was attended by 25 Indian stakeholders, in addition to an invited participant from the Bangladesh Department of Fisheries (see Annex 5). A letter describing the uptake of the workshop recommendations by the local collaborator, West Bengal Department of Fisheries,

is attached to this report at the end of Annex 5. Towards the raising of awareness in other Asian regions, including the Mekong, project materials have been submitted for uploading on both the STREAM and oneFish websites. It is expected that the availability of such information will be announced on the February 2006 e-newsletters of both these websites.

Regarding Output 3, KAP surveys were conducted in both Bangladesh and India at the start and end of the project activities. Initial impacts (on knowledge and attitudes) arising from the India workshop are reported in Annex 5. The outcome of project activities in Bangladesh is reported in the KAP survey report of Annex 6. In both target locations, the project has had positive impacts on knowledge and attitudes, although many of the programme's recommendations still remain to be operationalised at the field level (see Annexes 5 and 6).

**Table 1. Summary of achievements towards each of the project's planned communication products and activities, as proposed in the project communications matrix (as updated at the project Inception Workshop – see Annexes 3 and 4).**

Communication products	Project achievements
<b>Policy briefs</b> (co-authored where possible by senior ministry staff)	Not done. Project recommendations are largely incorporated already in the new draft fisheries strategy, and further promotion was achieved through face-to-face discussions particularly at the Fish Fortnight seminar (see below and Annex 2.2) attended by several high level policy makers. This was felt to be more effective than a written policy brief.
Provision of <b>PowerPoint presentations</b> for incorporation into existing training programmes	Five presentations produced (see Annex 1.2), made available on FMSP web site, delivered to key DOF reviewers at Bangladesh materials testing workshop and India workshop, and promoted at Fish Fair, in leaflets etc.
Preparation of <b>2-page summaries</b> of FMSP and other Bangladesh projects (also to contribute to FMSP programme level database)	Work in progress but not yet finished. Since this document will include projects of other non-FMSP funding agencies, it was agreed that this activity should be done as an internal BCAS document, not as a project output.
Articles for BCAS 'Bangladesh Environmental News' <b>newsletter</b> and DOF Fish Fortnight souvenir magazine, also submitted for use by other agencies' newsletters	Articles produced for 'BEN' and 'Fish Fortnight Souvenir' magazines (see Annex 1.6), 10,000 copies of latter distributed in Bangladesh and regionally.
Distribution of FMSP guidelines in <b>leaflet</b> form (e.g. based on SUFER formats)	Four-page leaflets produced on three key themes (see Annex 1.1). 1500 copies of each leaflet printed, mostly distributed at Fish Fair and India workshops. Remaining copies held at BCAS and MRAG for further distribution.
Distribution of <b>5-10 page managers guidelines</b> in Bangla	6 page English version produced (see Annex 1.5). Translation into Bangla now being finalized at BCAS/CNRS, then both versions to be posted on FMSP web site.
<b>Newspaper article</b> (based on newsletter material) and promoted to target 'green' newspapers (e.g. 'Bangla Daily')	Short articles published at time of Fish Fortnight in <i>Jugantor</i> and <i>Ittefaq</i> Bangladesh newspapers.
Provision of <b>bill boards and posters</b> for display in project locations to be selected by DOF and project partners; focus on clear simple messages with good artwork	<ul style="list-style-type: none"> <li>Two posters and two bill boards produced on sluice gate and harvest reserve themes (see Annexes 1.3 and 1.4).</li> <li>1000 copies of each poster printed (total 2000), displayed and distributed at Fish Fair, to DOF, NGOs, fisheries projects, local administrators, academics etc (see Annex 2.1).</li> <li>8 bill boards printed (four on each theme), with 6 displayed in Pabna FMSP site, and 2 in Tangail.</li> </ul>
<b>Information briefs</b> prepared around DFID guidelines for policy level audiences	DFID policy brief prepared in requested 'id21' format (see Annex 1.7)

<b>Communication activities</b>	
<b>Policy dialogue</b> with key influential stakeholders in one-to-one meetings and small multi-stakeholder workshops	<ul style="list-style-type: none"> <li>Discussions held with senior DOF staff at May Inception workshop and July materials testing workshop.</li> <li>Further high-level policy dialogue awaiting production of Bangladesh policy brief document.</li> </ul>
Sponsorship of <b>Fish Fortnight seminar</b> with DOF about floodplains management	Organised jointly with DOF, held on 8 August, and attended by 188 'signed in' delegates, including the three key government ministers and over 200 professionals and media. Results of DFID funded projects on floodplain fisheries were presented. This was the first time the official government Fish Fortnight had highlighted the importance of floodplain capture fisheries (see Annex 2.2).
Hosting of <b>FMSP/BCAS stall</b> at DOF Fish Fortnight Fair (activity added to communication strategy to enhance promotion opportunities)	Stall hosted for duration of Fish Fair, 9-17 August, attended by 634 registered visitors, including senior government officials, plus many others (estimated as over 4,000 in total, see Annex 2.1). National TV coverage included the visit of the Minister's entourage to the stall.
Inclusion of key FMSP points in draft ' <b>Parliamentary Policy Paper</b> on Fish Sanctuaries'	Revisions to DOF's draft 'Proposed Amendments to the Protection and conservation of Fish Act, 1950 to incorporate provisions on Fish Sanctuary' submitted June 2005. Inputs were considered by the Parliamentary Standing Committee but the final outcome not yet known.
Development of <b>BCAS and CNRS web sites</b> to provide access to e-docs and directions to hard copy grey literature in library	BCAS site developed to add link to FMSP project web page (see <a href="http://www.bcas.net/">http://www.bcas.net/</a> ). Links not yet developed on CNRS web site. BCAS and CNRS provided with copies of early FMSP reports for their libraries at Inception Workshop.
Powerpoint presentations at <b>senior managers monthly meetings</b> , with hard copy handouts of management guidelines, leaflets and policy briefs etc	No specific presentations yet, but largely covered by dissemination of materials and displays at Fish Fortnight Fair.
<b>Briefings at upazilla monthly meetings</b> in 2-3 locations to be selected by DOF	<ul style="list-style-type: none"> <li>BCAS project staff participated in upazilla level coordination meeting to improve sluice gate operation, already in Pabna.</li> <li>Suitable opportunities still awaited for Tangail activities, where no gate management committee yet exists.</li> </ul>
<b>Focus groups / training</b> at FMSP sites in Tangail / Pabna, to coincide with start of flood	<ul style="list-style-type: none"> <li>Focus group discussions held in Pabna at start of flood (June 2005).</li> <li>Awaiting opportunities for Tangail as above.</li> </ul>
<b>Street theatre + pot songs</b> - up to 10 locations/performances at selected sites, during Fish Fortnight, with invitations to TV media to film and distribute nationally	Street theatre play and related pot songs performed at Fish Fortnight on 11 August 2005, and at nine locations in four field districts (Pabna, Tangail, Magura and Gopalganj), 17-27 September to audiences of approximately 500-1500 on each performance (see Annexes 2.3 and 2.4). No TV coverage reported.
<b>India workshop</b> in Calcutta for water planners/managers, to present Bangladesh policy briefs, training materials, other guidelines etc, as relevant to India	New PowerPoint presentations given at India dissemination workshop on 5-6 August, along with invited presentations from local experts, and uptake promoted. Leaflets issued. Workshop attended by 34 participants, and positive changes in knowledge and attitude reported (see Annex 5).
<b>Postal dissemination of hard copy materials</b> and electronic dissemination on <b>web sites</b> (esp. STREAM, WorldFish) or via e-groups	<ul style="list-style-type: none"> <li>Postal dissemination to all targeted stakeholder in Bangladesh.</li> <li>New outreach materials and existing key documents posted for free download with introductory guidance on FMSP project web page.</li> <li>Materials submitted for uploading on both the STREAM and oneFish websites, providing introductory guidance and download links for all project e-materials. Availability of project materials to be announced in February 2006 newsletters of both these websites.</li> </ul>

## 6. Research Activities:

This project was commissioned to synthesize the key messages arising from the FMSP cluster of floodplain fisheries projects and to promote these to policy makers and implementing agencies in Bangladesh and the South and Southeast Asian regions. The project also aimed to provide guidance on climate change issues and other existing knowledge from previous or current NRSP LWI and DFID Water KAR projects including R4778J, R6756, R7868, R6744, R7793, R8195 and R8306.

The project began in April 2005 with the listing and summarization of existing knowledge on floodplain fisheries management, derived from FMSP and other DFID projects. This was written up as a 59 page internal report (Halls et al, 2005, see publications list) that formed the basis of discussions at the project's May Inception Workshop (see Annex 3). The Inception Workshop confirmed the identities of communication stakeholders in Bangladesh and elsewhere in Asia, and planned communication products and activities for their promotion (see updated communications plan in Annex 4). A detailed Inception Workshop Report was submitted with the first Quarterly Report in June.

Participants were invited to the Inception Workshop from relevant government, NGO and regional bodies and development projects from Bangladesh, India and the Mekong region (Cambodia, Lao PDR and Vietnam). The workshop was well attended by Bangladeshi stakeholders, with 38 and 25 local participants on days 1 and 2 respectively, not including the members of the project team. These included senior staff of both the key target agencies in the fisheries, agricultural extension and water resources sectors (see Annex 3).

The workshop was less well attended by the regional community, with only one person, Mr Kamphet Roger representing Lao PDR and the Mekong region. The staff of India's West Bengal Department of Fisheries were unable to attend as insufficient time was available to obtain state government permission for such international travel. Inputs from these Indian collaborators were instead obtained at meetings in India in the following week (9-13 May) while on related FMSP project R8468. Invitees of both MRC and STREAM were unavailable to attend due to prior engagements.

Twenty copies of the 1999 FMSP summary guidelines on Asian river fisheries, as published by FAO<sup>1</sup> were distributed at the workshop. Copies of the Final Technical Reports and related papers from early projects R4791 and R5953 were taken for local libraries of BCAS and CNRS and Dhaka University Fisheries Department. The latter papers are available only in hard copy, with the original documents not including the graphics.

The finalization of the communication plan involved no significant changes to the logical framework. Activity OVI 1.3c was however amended to allow for the intended timing of communication events to coincide with the Department of Fisheries 'Fish Fortnight' (see Annex 2.1), and the timing of the 2005 Bangladesh flood.

Key outputs from the FMSP, NRSP LWI and other DFID projects were identified at the Inception Workshop and agreed with communication stakeholders. These included scientific knowledge, management guidelines and assessment methodologies as summarized in Table 2 below.

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<sup>1</sup> Hoggarth et al, 1999. Management Guidelines for Asian River Fisheries. FAO Fish. Tech. Paper 384. Parts 1 and 2. (Download: <http://www.fao.org/DOCREP/006/X1357E/X1357E00.HTM>)

**Table 2. Key outputs from the FMSP, NRSP LWI and other DFID projects**

	From project/s
<b>Knowledge</b>	
Impact of FCDIs (Bangladesh)	R5953 - Fisheries dynamics of modified floodplains in Southern Asia
Impact of reserves / sanctuaries - (Bangladesh – modeling) - (Indonesia – empirical studies)	R5953 - Fisheries dynamics of modified floodplains in Southern Asia R7043 - Selection criteria and co-management guidelines for harvest reserves for tropical fisheries
<b>Management guidelines</b>	
Fish stocking	R6494 - Evaluation of the biological and socioeconomic benefits of enhancement of floodplain fisheries
Framework for floodplain fishery management	FAO Paper 384 (programme)
Sanctuaries (harvest reserves) - selection criteria and management	R7043 - Selection criteria and co-management guidelines for harvest reserves for tropical fisheries
Self-recruiting species in aquaculture	R7917 - Self recruiting species in aquaculture – their role in rural livelihoods
Operation of sluice gates	R5953 - Fisheries dynamics of modified floodplains in S. Asia, R8210 - the use of sluice gates for stock enhancement and diversification of livelihoods, (R7868 - Maximization of joint benefits from multiple resource use in Bangladesh floodplains, R7793 – Managing impacts of irrigation development on fisheries) <sup>2</sup>
<b>Assessment methods</b>	
Area-based predictive models	R5030 - Synthesis of simple predictive models for fish river yields in major tropical rivers, (R7834 - Interdisciplinary multivariate analysis for adaptive co-management)
Population dynamics models including hydrology	R5953 - Fisheries dynamics if modified flood plains in S. Asia, (R7868 - Maximization of joint benefits from multiple resource use in Bangladesh floodplains)
Multi-species, multi-gear modeling of management options	(R4791 - Poverty, equity and sustainability in the management of inland capture fisheries of south and south east Asia)

Based on the current knowledge, attitude and practices of key stakeholders, the inception workshop confirmed the current validity and need for this knowledge by different stakeholders in Bangladesh, India and Lao PDR (see communications matrix, Annex 4).

Following the Inception Workshop, to develop the communication products, the project partners (including ITDG-Bangladesh for project R7917) summarized the FMSP knowledge from the above projects in the following five key themes:

- Fish sanctuaries for floodplain fishery benefits
- Management of FCDI sluice gates and water levels for integrated benefits of agriculture and fisheries
- Self-recruiting species in aquaculture and rural livelihoods
- Fish stocking
- Floodplain fishery modeling and assessment methods

For each of these themes, 'key messages' documents were produced giving 2-6 key one-line messages for use by the Bangladesh partners in the development of leaflets, summary guidelines, posters, street theatre and pot-songs etc. Each main point was supported by

<sup>2</sup> Brackets indicate related but non-FMSP cluster 9 projects



summary information on the scientific background for the recommendation along with any evidence of the expected benefits and/or implementation details. References were also provided along with locations for internet downloads etc.

The key messages on these themes were then tested with Bangladesh communication stakeholders at the second project workshop in Dhaka on 5<sup>th</sup> July. In those discussions, the key messages on self recruiting species were seen to be in conflict with current DOF guidelines (and are already being promoted by project R7917), while those on fish stocking were found to be largely already adopted by DOF. The project thus agreed to focus on producing communication materials promoting the general guidelines for integrated floodplain management (summarized in FAO Fish. Tech. Paper 384/1), and the specific key messages on harvest reserves / fish sanctuaries and the management of sluice gates (see project leaflets in Annex 1.1 for details of the identified key messages on these three themes).

Following the testing workshop, a range of communication products were then produced by the project partners ready for promotion at and around the Bangladesh DOF's 2005 'Fish Fortnight' in August. The Fish Fortnight is the premier annual fisheries event in Bangladesh, when fisheries officials, the public and the media focus extensively on the country's aquatic resources. The Fortnight includes a series of seminars, workshops, round table discussion meetings etc, on a wide range of fisheries issues. In 2005, it included a 'Fish Fair' from 9<sup>th</sup> to 17<sup>th</sup> August, held at Shilpakala Academy, adjacent to the Department of Fisheries (Matshya Bhavan, Dhaka). To take advantage of this opportunity, the project reserved a stall at the Fish Fair for the promotion of the FMSP knowledge (see Annex 2.1). It also organized a special seminar on floodplain fisheries resources, which was attended by three ministers and many staff of relevant government and NGO bodies (see Annex 2.2). FMSP knowledge was promoted at the Fish Fair and the seminar, and elsewhere around Bangladesh using the projects leaflets, PowerPoint presentations, pot songs, theatre productions etc as described in Table 1 above, and in Annexes 1 and 2 below.

Towards **Output 2**, in India, FMSP floodplains cluster knowledge was disseminated at a two-day workshop held at Kolkata's, Great Eastern Hotel, on 5-6 August 2005. This was conducted in collaboration with the West Bengal Department of Fisheries. As with the Bangladesh activities, the presentations focused on the four main themes – general management, harvest reserves, sluice gates and floodplain fishery modeling (see Annex 1). Time was also included for the presentation of local experience on floodplain fishery management, both Indian and Bangladeshi, and for brief descriptions of the NRSP floodplains projects. The presentation by Bangladesh DOF participant, Masood Siddique, was of particular interest to the Indian participants. This described the new Bangladesh DOF strategy for management of the open water capture fisheries, which includes many of the recommendations promoted by the FMSP floodplains cluster projects. Electronic copies of the various guidelines, leaflets and presentations etc were provided to the workshop participants on CD.

For promotion of knowledge into the Mekong region, electronic materials and introductory notes have been submitted for uploading on to the 'Other Organisations' page of the STREAM website (<http://www.streaminitiative.org/Library/organizations/index.html>), as also used by other FMSP projects. Text for a publicity announcement has also been submitted for inclusion in the next STREAM newsletter. It is understood that the numbers of hits on the STREAM web pages are analysed and published on the site on a monthly basis. Similar materials and links have also been uploaded to the FAO/SIFAR oneFish website providing links to the FMSP site for downloads.

A policy document in the 'id21' format requested by DFID and the FMSP programme managers has also been prepared (see Annex 1.7). This has not yet been submitted to the relevant communication stakeholder (DFID policy makers), but it is understood that it will be

included as one of the ten-part series being prepared for submission at the FMSP programme level.

## **7. Contribution of Outputs:**

### **7.1 Contribution to FMSP's purpose and outputs**

The project was designed to promote the uptake of existing FMSP (and other DFID) knowledge on floodplain fisheries via a range of communication channels. At the FMSP output level, the project contributes specifically to the floodplain-related requirements of Output OVI 5:

5. *Pro-poor capture fisheries management strategies actively promoted into at least four target institutions (including the DFID bilateral country programmes) in two target countries and widely promoted (nationally and internationally) by 31 March 2006.*

The project's communications products have been actively promoted in two of the key DFID geographic focus areas of Bangladesh and West Bengal, India. It is hoped that further outreach within the region will be achieved by the uploading of project materials on to the STREAM website.

On application of the outputs, the project will contribute to the FMSP's Purpose OVIs 1, 2 and 3 for *capture* fisheries, and especially to OVI 1: *Less variable capture fisheries production, and yield stabilised at sustainable level to support sustainable livelihoods*. Effective implementation of both harvest reserves and sluice gate management will sustain fisheries production inside the many impounded floodplains in both Bangladesh and West Bengal. Successful implementation will also contribute to OVI 2, at least in the sense of good management sustaining fisheries employment, compared to the alternative likely trajectory of declining yields and livelihoods. Regarding OVI 3, the range of communications channels and media used by the project will have delivered FMSP knowledge to an equally wide range of fisheries stakeholders including poor resource users.

### **7.2 Impact of the project**

Progress towards the project's Purpose level OVIs will take some years to achieve, following the successful application of knowledge at the policy and field levels. The project has achieved positive initial impacts in terms of changes in knowledge and attitude, as measured by the KAP surveys conducted in Bangladesh at the start and end of the project (see Annex 6). Attitudes clearly still vary between different communication stakeholders and many recommendations are still more commonly implemented in development projects than as routine practice of government agencies. Many of the FMSP recommendations on floodplain fisheries management (including the use of reserves and management of sluice gates), however, have now been incorporated into the new Bangladesh open-water capture fisheries strategy produced by the Bangladesh DOF and the Fourth Fisheries Project. The real impact of the programme, therefore, may best be assessed by comparing the current very positive strategies now in place in Bangladesh (emphasizing adaptive co-management with strong local involvement in planning, monitoring and enforcement), with the largely technical measures (especially stocking) that were being used at the start of the FMSP activities in the early and mid-1990s. The new guidelines and training products provided by the project will significantly help with the implementation of the new Bangladesh fisheries strategy. The current policy environment will provide a healthy climate for uptake of the FMSP knowledge.

### **7.3 Further work**

Most of the project's intended communication products (e.g. PowerPoint presentations, leaflets, posters, etc) have now been transferred to the intended target groups. A few final tasks are now under way to ensure that all materials are available on the FMSP and STREAM websites, and suitable links made on the partners' sites (BCAS, CNRS).

Recognising that specific guidance on implementation strategies is still much needed at field levels in Bangladesh, it is recommended that further training and communications-related work could usefully be undertaken at the level of field resource managers. To extend beyond existing FMSP field sites, this could include a radio-based campaign raising issues and promoting public debate about floodplain fisheries management.

In the wider region, and especially the Mekong, uptake could be promoted by translations of materials into local languages. The STREAM contacts particularly recommended this as a worthwhile exercise for their local stakeholders, and have offered to facilitate such an exercise (at cost).

Finally, noting the wide diversity of communications products and channels used in the project, some systematic research could be undertaken into the specific impacts of the different approaches that were adopted. This was not a focus of this project, but such research would take advantage of this valuable opportunity to fully understand the effects, over time, of different materials in raising awareness and changing management practices.

## **8. Publications and other communications materials**

### **(a) Peer-reviewed publications (published);**

Hoggarth, D.D., S. Koeshendrajana, M. Aeron-Thomas, C. Garaway, A.S. Halls, Z. Nasution, Samuel, and A. Sarnita. 2004. An integrated assessment of Indonesian river fishery reserves; Part 1 – Introduction and study design; Part 2 – Institutional analyses; Part 3 – Biological studies; Part 4 – Socio-economic studies and the distribution of fisheries costs and benefits. *Indonesian Fisheries Research Journal*. Vol. 9, No.1: 1-26.

The above paper was published by Project R7043 collaborators, CRIFI, in their own in-house journal, the Indonesian Fisheries Research Journal. This is widely read in Indonesia, but is not currently available on-line. Internet access to this important summary paper has therefore now been made available on the FMSP R7043 project page, with the permission of the CRIFI publishers.

### **(b) Peer-reviewed publications (in press or submitted)**

None

### **(c) Non peer-reviewed publications and reports and communications materials**

#### **Leaflets (see Annex 1.1)**

*Management guidelines for Asian floodplain river fisheries – helping to ensure sustainable rural livelihoods.*

*Using Harvest reserves or fish sanctuaries in floodplain river fisheries – helping to ensure sustainable rural livelihoods.*

*Improving fish catches inside flood control schemes*

#### **PowerPoint presentations (see Annex 1.2)**

Hoggarth, D.D., 2005. *Management guidelines for Asian Floodplain river fisheries.*  
([www.fmmsp.co.uk](http://www.fmmsp.co.uk))

Hoggarth, D.D., 2005. *Harvest reserves in floodplain river fisheries - Protecting fish to*

increase catches. Key messages for selection and management. ([www.fmisp.co.uk](http://www.fmisp.co.uk))  
 Hoggarth, D.D., 2005. *Harvest reserves in floodplain river fisheries - Protecting fish to increase catches. Training Workshop Materials.* ([www.fmisp.co.uk](http://www.fmisp.co.uk))  
 Halls, A.S., 2005. Flood Control Impacts on Fisheries: Guidelines for Mitigation. ([www.fmisp.co.uk](http://www.fmisp.co.uk))  
 Halls, A.S. and D.D. Hoggarth, 2005. *Modelling floodplain river fisheries – an introduction. Training workshop materials.* ([www.fmisp.co.uk](http://www.fmisp.co.uk))

### **Billboards (see Annex 1.3)**

1. Promoting the use of harvest reserves / fish sanctuaries.
2. Promoting the fish-friendly management of sluice gates in FCDI schemes.

### **Posters (see Annex 1.4)**

1. Promoting the use of harvest reserves / fish sanctuaries.
2. Promoting the fish-friendly management of sluice gates in FCDI schemes.

### **Management guidelines (see Annex 1.5)**

Halls, A.S., 2005. Floodplain River Fisheries: A Managers Guide. Aquae Sulis Ltd. 6pp. (English version)  
 Halls, A.S., 2005. Floodplain River Fisheries: A Managers Guide. Aquae Sulis Ltd. 6pp. (Bangla version)

### **Newsletter articles etc (see Annex 1.6)**

BCAS, 2005. Use of Sluice Gates for Rice and Fish Production in Modified Floodplains. *In: Bangladesh Fish Fortnight 2005 Souvenir Magazine.* Bangladesh Dept of Fisheries. 5pp. (Main text in Bangla, abstract in English)  
 BCAS, 2005. Outreach programme of DFID-FMSP for Management Floodplain Fisheries. P2 *In: Bangladesh Environment Newsletter.* Volume 16, No. 1, June 2005. BCAS. 8pp.  
 Two newspaper articles published in *Jugantor* and *Ittefaq* Bangladesh newspapers, August 2005, coinciding with Fish Fortnight activities.

### **DFID Policy Brief (see Annex 1.7)**

Hoggarth, D.D., 2005. *Management Guidelines for Asian Floodplain River Fisheries.* FMSP Policy Series. No XX. 7pp.

### **Project summaries report (submitted with May 2005 Inception Report)**

Halls, A.S., Hoggarth, D.D., Huq, S., Rahman, M., Reid, H. and Alam, S.S. Summaries of FMSP Floodplains Projects and Related DFID Research. FMSP Project R8486. Promotion of FMSP guidelines for floodplain fisheries management and sluice gate control. 59pp.

### **(d) Verbal presentations & project dissemination and other workshops**

Project Inception Workshop, held at BRAC Inn, Dhaka, 3-4 May 2005. (See May 2005 Inception Report submitted with First Quarterly Report, and Annex 3).  
 Project materials testing workshop, held at BCAS, 5 July 2005, attended by 12-15 key representatives of DOF and fisheries NGOs and projects.  
 Hosting of BCAS/FMSP stall at Bangladesh DOF Fish Fortnight Fair, 9-17<sup>th</sup> August 2005 (see Annex 2.1)  
 FMSP Sponsored seminar at Bangladesh DOF Fish Fortnight, 8 August 2005 (see Annex 2.2)  
 Performances of pot songs and theatrical dramas, incorporating the key messages on use of sluice gate and harvest reserves on 11 August 2005 at the National Fish Fortnight and at

four other locations in Pabna, Tangail, Magura and Gopalganj, between 17 and 27 September 2005 (see Annexes 2.3 and 2.4).  
 India Dissemination Workshop, held in Kolkata, West Bengal, 5-6 August 2005, in collaboration with the West Bengal Department of Fisheries (see Annex 5).

#### (e) Other types of project output (eg literature reviews, databases, software etc)

##### Websites

- Key documents, leaflets, presentations have been made available on the R8486 project page of the FMSP website, for free download and use. The page also includes introductory notes on the available materials, and links to relevant FMSP and NRSP project pages.
- Summary introductory materials submitted for uploading to the STREAM and oneFish websites providing links to download sites for all electronic materials.
- Links to the FMSP floodplain fisheries web page have also been provided on the BCAS web site (see <http://www.bcas.net/>).

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## 10. Project Logframe

Narrative summary	Objectively verifiable indicators	Means of verification	Important assumptions
Goal			
Existing FMSP research outputs relating to: the contribution of <u>capture</u> and <u>enhancement</u> fisheries to the livelihoods of the poor; fisheries management tools and strategies that could benefit the poor; and, the means to realise improved management, further developed, disseminated and promoted to relevant stakeholders at all levels	5. Pro-poor <u>capture</u> fisheries management strategies actively promoted into at least four target institutions (including the DFID bilateral country programmes) in two target countries and widely promoted (nationally and internationally) by 31 March 2006.	<ul style="list-style-type: none"> <li>• Programme Management review</li> <li>• Project FTRs</li> <li>• Programme highlights</li> <li>• Publications and other communications materials</li> <li>• Teaching materials</li> <li>• Fisheries management tools</li> <li>• Quarterly and annual reports</li> <li>• FMSP project database</li> <li>• FMSP Website</li> <li>• Requests for manuals and guidelines received</li> <li>• Uptake of research products by target institutions monitored and reported in Annual Report</li> <li>• National statistics and publications</li> <li>• International networks, databases</li> </ul>	<ul style="list-style-type: none"> <li>• Policy makers remain receptive to information on fisheries management</li> <li>• Government policies continue to support co-management</li> <li>• Government policies continue to support pro-poor approaches</li> <li>• Target beneficiaries remain receptive to management approaches proposed.</li> <li>• Stock enhancement process cost effective and socially</li> </ul>



		and publications	appropriate. • Target beneficiaries adopt and use strategies
<b>Purpose</b>			
5.3 FMSP guidelines for floodplain fisheries management and sluice gate control actively promoted to relevant target institutions including DFID bilateral country projects (e.g. Bangladesh, 4th Fisheries Project).	<ol style="list-style-type: none"> <li>By 21 October 2005, FMSP guidelines relating to integrated floodplain resource management adopted/endorsed in Bangladesh, both at policy level and for practical field use by government offices and development projects.</li> <li>By 21 October 2005, awareness about FMSP outputs raised among target stakeholders in at least three Mekong countries, West Bengal state in India, and promoted around the Asian region.</li> <li>By 31 October, initial and potential impacts of project uptake promotion activities documented.</li> </ol>	<ol style="list-style-type: none"> <li>Direct contacts with communication stakeholders, and using indicators as developed in Activity 3.1.</li> <li>As above.</li> </ol>	
<b>Outputs</b>			
<ol style="list-style-type: none"> <li>Existing knowledge on floodplain river fisheries management from FMSP and other sources packaged and actively promoted to communication stakeholders in Bangladesh according to their identified needs, thereby developing the capacities of BCAS and CNRS as joint centres of excellence on integrated floodplain fisheries management in Bangladesh.</li> <li>Awareness raised about FMSP and other knowledge on integrated floodplain resource management in target Mekong countries and wider Asian region outside project sites.</li> <li>Impacts of project uptake promotion activities documented for a range of communication stakeholders.</li> </ol>	<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>By 13 May 2005, communications needs of target audiences in Bangladesh identified, communications plan updated and inception report submitted to FMSP for PAC feedback.</li> <li>By 15 July 2005, new outreach materials tested and presented to policy-level stakeholders in Bangladesh.</li> <li>By 30 September 2005, FMSP knowledge published in English and Bangla languages as appropriate, including in BCAS and CNRS media, and uptake promoted by selected communication stakeholders at field, management and policy levels in Bangladesh.</li> </ol> </li> <li> <ol style="list-style-type: none"> <li>By 15 July 2005, communications needs of target audiences in Mekong and wider Asian region identified and communications plan updated.</li> <li>By 12 August 2005, new materials disseminated to Indian stakeholders.</li> <li>By 21 October 2005, materials disseminated to Mekong and wider Asian audience via electronic or other channels.</li> <li>By 21 October 2005, contributions made to programme level uptake promotion activities.</li> </ol> </li> <li>By 31 October 2005, FTR documents outcomes of promoting floodplain management messages to communication stakeholders at a range of levels.</li> </ol>	<ol style="list-style-type: none"> <li>Project quarterly reports and inception report.</li> <li>Project quarterly reports and copies of new materials.</li> <li>Project quarterly reports and copies of new materials (translated into English as needed).</li> <li>Project quarterly reports.</li> <li>Project quarterly reports and copies of new materials.</li> <li>Project quarterly reports, including web addresses, website hits; courier / postal receipts etc.</li> <li>Project quarterly reports.</li> </ol>	<ul style="list-style-type: none"> <li>Policy makers and resource managers in Bangladesh and the Southeast Asian Region are receptive to the project outputs and willing and able to introduce them into their sphere of influence.</li> <li>Suitable media and channels are available for regional dissemination of project outputs.</li> <li></li> </ul>
<b>Activities</b>		<b>Budget and milestones</b>	
<ol style="list-style-type: none"> <li>1.a List and summarise existing FMSP, NRSP LWI outputs and other knowledge relevant to integrated management of floodplain river resources.</li> <li>1.b Identify specific communication stakeholders in Bangladesh, Mekong and India for invitation to project workshops.</li> <li>1.c Hold regional workshop for</li> </ol>	<ol style="list-style-type: none"> <li>1.a By 29 April 2005, existing knowledge sources listed and summarised.</li> <li>1.b By 4 April 2005, communication stakeholders identified and invited to project workshop in Bangladesh.</li> <li>1.c By 6 May 2005, one week workshop in Bangladesh attended by</li> </ol>		<ul style="list-style-type: none"> <li>Political volatility in Bangladesh does not make outreach activities</li> </ul>

<p>Bangladeshi, Mekong and Indian communication stakeholders to present and discuss existing knowledge, management practices, impacts and dependencies of floodplain resource users</p> <p>1.1d Identify needs of target communication stakeholders at all levels, as relevant to integrated management of river floodplain resources and agree a strategy to maximise impacts of outreach activities.</p> <p>1.2a Guided by above, develop new outreach materials to meet specific information / training needs of priority target users re integrated floodplain management (e.g. reports, posters, leaflets, handbooks, videos, etc, in Bangla or English).</p> <p>1.2b Hold second regional workshop or series of meetings in Bangladesh to present policy-level outputs and test draft management- and training-level materials with communication partners.</p> <p>1.3a Finalise materials according to comments received in 1.2b.</p> <p>1.3b Publish hard copies of finalised materials in English and/or Bangla languages as appropriate, including in BCAS and CNRS media.</p> <p>1.3c Undertake field-level and other outreach activities (as guided by activities 1.1d and 1.2b) to promote uptake of knowledge by Bangladeshi communication stakeholders.</p> <p>2.1 Alongside workshops 1.1c and 1.2b, investigate options for dissemination of communication materials outside target sites and confirm with relevant outreach institutions and projects (eg FAO oneFish, STREAM, WorldFish Centre) appropriate formats for delivery of information.</p> <p>2.2 Guided by above, present FMSP knowledge at Indian workshop.</p> <p>2.3 Develop and promote communications products for Mekong and wider Asian region according to media and communications channels identified in communications plan (e.g. including briefs, newsletter articles, web pages).</p> <p>2.4 Contribute to Programme-level uptake promotion activities as required.</p> <p>3.1a Cross cutting all other</p>	<p>at least 25 policy makers, resource managers and development project staff from Bangladesh, Indian and Mekong region.</p> <p>1.1d By 13 May 2005, communication plan updated, and submitted to FMSP management with an Inception Report identifying any clarification of the log frame and/or project responsibilities.</p> <p>1.2a By 1 July 2005, first draft new materials developed.</p> <p>1.2b By 15 July 2005, testing workshops and/or meetings attended by Bangladesh and Indian collaborators.</p> <p>1.3a By 5 August 2005, materials finalised.</p> <p>1.3b By 26 August 2005, materials published in Bangladesh.</p> <p>1.3c By 21 October 2005, and coinciding where possible with DOF 'Fish Fortnight' and key flood events, Bangla-language training and materials promoted to sluice gate managers and other field-level or project-level stakeholders in Bangladesh, and English language materials promoted to policy and management-level stakeholders.</p> <p>2.1 By 13 May 2005 (with a final review by 15 July 2005), communications plan updated for outreach to SE Asian stakeholders.</p> <p>2.2 By 12 August 2005, Indian dissemination workshop in Calcutta attended by at least 15 communication stakeholders (to be identified).</p> <p>2.3 By 21 October 2005, post / submit / upload or otherwise electronically disseminate materials.</p> <p>2.4 By 21 October 2005.</p> <p>3.1a By 29 April 2005, indicators to evaluate change in capacity in</p>	<p>impossible.</p> <p>• Floods in Bangladesh do not prevent completion of project work on time.</p>
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activities, develop indicators at first workshop (Activity 1.1c) as required to monitor and evaluate achievement of project outputs and purpose.	fisheries management and training institutions, outcomes at policy level, and wider uptake and awareness identified (e.g. including before and after knowledge-attitude-practice questionnaires, citations, or references to knowledge in published materials).	
3.1b Indicator data collected as required.	3.1b By 21 October 2005, indicator data collected by all partners as agreed.	
3.1c Project achievements evaluated and reported.	3.1c By project end (31 October 2005), initial results analysed and reported in FTR.	
		<u>Budget allocations:</u> Output 1                      £64,320 including part costs for Outputs 2 & 3 Output 2                      £11,655 Output 3 (M&E)              £4,025 Total                            £80,000

## 11. Keywords

Floodplain fisheries, sluice gate management, harvest reserves / fish sanctuaries, Bangladesh, India.

## 12. Acronyms and Abbreviations

BARC	Bangladesh Agricultural Research Council
BCAS	Bangladesh Centre for Advanced studies
BELA	Bangladesh Environmental Lawyers Association
BEN	Bangladesh Environment Newsletter
BRAC	Bangladesh Rural Advancement Committee
BWDB	Bangladesh Water Development Board
CBFM2	Second Community Based Fisheries Management Project, Bangladesh
CD	Compact Disc
CNRS	Centre for Natural Resource Studies
DAE	Department of Agricultural Extension
DFID	Department for International Development
DOF	Department Of Fisheries
FAO	Food and Agriculture Organisation
FAP	Flood Action Plan
FCDI	Flood Control Drainage and Irrigation schemes
FFP	Fourth Fisheries Project, Bangladesh
FMSP	Fisheries Management Science Programme
FTR	Final Technical Report
GDP	Gross Domestic Product
IIED	International Institute for Environment and Development
ITDG	Intermediate Technology Development Group
KAP	Knowledge, Attitude and Practice
KAR	Knowledge and Research
LGED	Local Government Engineering Department
LWI	Land Water Interface
MACH	Management of Aquatic Ecosystems through Community Husbandry project
MRAG	Marine Resources Assessment Group
MRC	Mekong River Commission
NGO	Non-Government Organisation
NRSP	Natural Resources Systems Programme
OVI	Objectively Verifiable Indicator
PIRDP	Pabna Irrigation and Rural Development Project (FMSP case study site)
SRS	Self Recruiting Species (as compared to aquaculture species)
STREAM	Support to Regional Aquatic Resources Management
TI	Target Institutes
WFC	World Fish Centre

## 13. Annexes

### **Annex 1. Outreach materials produced**

#### **Annex 1.1 Leaflets**

Three leaflets were developed by the project covering the three key themes, as included below (in hard copy of report only). The leaflets were distributed in Bangladesh at the fish fair and elsewhere, and at the dissemination workshop in India. 'PDF' versions have been made available on the FMSP project web site, and spare copies provided to FMSP management.

##### **Management guidelines leaflet**

*Management guidelines for Asian floodplain river fisheries – helping to ensure sustainable rural livelihoods.*

Providing summary guidance from FAO Fishery Technical Paper 384/1, and links for downloading the full documents from the FAO web site.

##### **Harvest reserves leaflet**

*Using Harvest reserves or fish sanctuaries in floodplain river fisheries – helping to ensure sustainable rural livelihoods.*

Summarising the five key messages on harvest reserves, and giving links for downloads of guideline documents and presentations.

##### **FCDI Sluice gates management leaflet**

*Improving fish catches inside flood control schemes*

Summarising the six key messages on sluice gate management for floodplain fish production, with links for further information.

## **Annex 1.2    PowerPoint presentations**

Five training presentations were developed by the project and made available on the FMSP web site. These may be used 'as is' in existing training programmes or academic curricula, or developed by users as required. Summary contents are given below. Please see [www.fmsp.co.uk](http://www.fmsp.co.uk) to download the full contents.

### **Management guidelines for Asian Floodplain river fisheries**

*An overview of FMSP research - published as FAO Fisheries Technical Paper 384*

By D.D. Hoggarth

#### Summary of contents (40 slides)

- Why manage?
- What to manage?
- Who should manage?
- How to manage?
- Steps to successful management

### **Harvest reserves key messages presentation**

*Harvest reserves in floodplain river fisheries - Protecting fish to increase catches. Key messages for selection and management.*

By D.D. Hoggarth

#### Summary of contents (34 slides)

- Key messages on selecting and managing harvest reserves for floodplain river fisheries
- What is a 'harvest reserve'
- Why use harvest reserves? (summary of FMSP studies, impacts etc)
- Summary guidance on key messages 1-5

### **Harvest reserves training presentation**

*Harvest reserves in floodplain river fisheries - Protecting fish to increase catches. Training Workshop Materials*

By D.D. Hoggarth

#### Summary of contents (52 slides)

- Guiding principles for managing river fisheries
- Suggested workshop programme for selecting and managing harvest reserves
- Step 1. Which water-bodies should be used as reserves?
- Step 2. Where should co-management be encouraged?  
Visual guidance and checklists included for application of both selection criteria (steps 1 and 2) to existing local reserves or candidate sites etc
- Step 3. Who are the stakeholders?
- Step 4. What are the management needs?
- Step 5. What spatial management units are needed and how could they be identified and managed?
- Step 6. What reserve management rules should be used?
- Next steps...

## **FCDI key messages presentation**

*Flood Control Impacts on Fisheries: Guidelines for Mitigation.*

By A.S. Halls

### Summary of contents (23 slides)

- Introduction (impacts of FCDI schemes in Bangladesh)
- Management guidelines for improving fish access into FCDI schemes
- Management guidelines for increasing production of resident fish

## **Floodplain modelling presentation**

*Modelling floodplain river fisheries – an introduction. Training workshop materials.*

By A.S. Halls and D.D. Hoggarth

### Summary of contents (36 slides)

- Introduction: What are models; Types of models; Purpose of models; Further Reading
- 1. Empirical models:
  - 1.1. Linear models
    - 1.1.1. Simple Linear Regression
    - 1.1.2. Multiple Linear Regression (MLR) and General Linear Models (GLM)
  - 1.2. Non-linear models
    - 1.2.1. Empirical surplus production models (Non-linear regression)
    - 1.2.2. Bayesian Networks (BNs)
- 2. Population Dynamics Models
  - 2.1. Age structured Populations Dynamics (ASPD)
    - 2.1.1. Dynamic Pool Model for Floodplain Fisheries
    - 2.1.2. BEAM 4



**Bill board 1. Promoting the use of harvest reserves / fish sanctuaries**

Four boards erected, three at Pabna FMSP field site and one at Tangail

Translation of text: Select the deeper part of the water body to establish harvest reserve. Keep the reserve intact and get involved controlled fishing. For further information Contact the fisheries officer

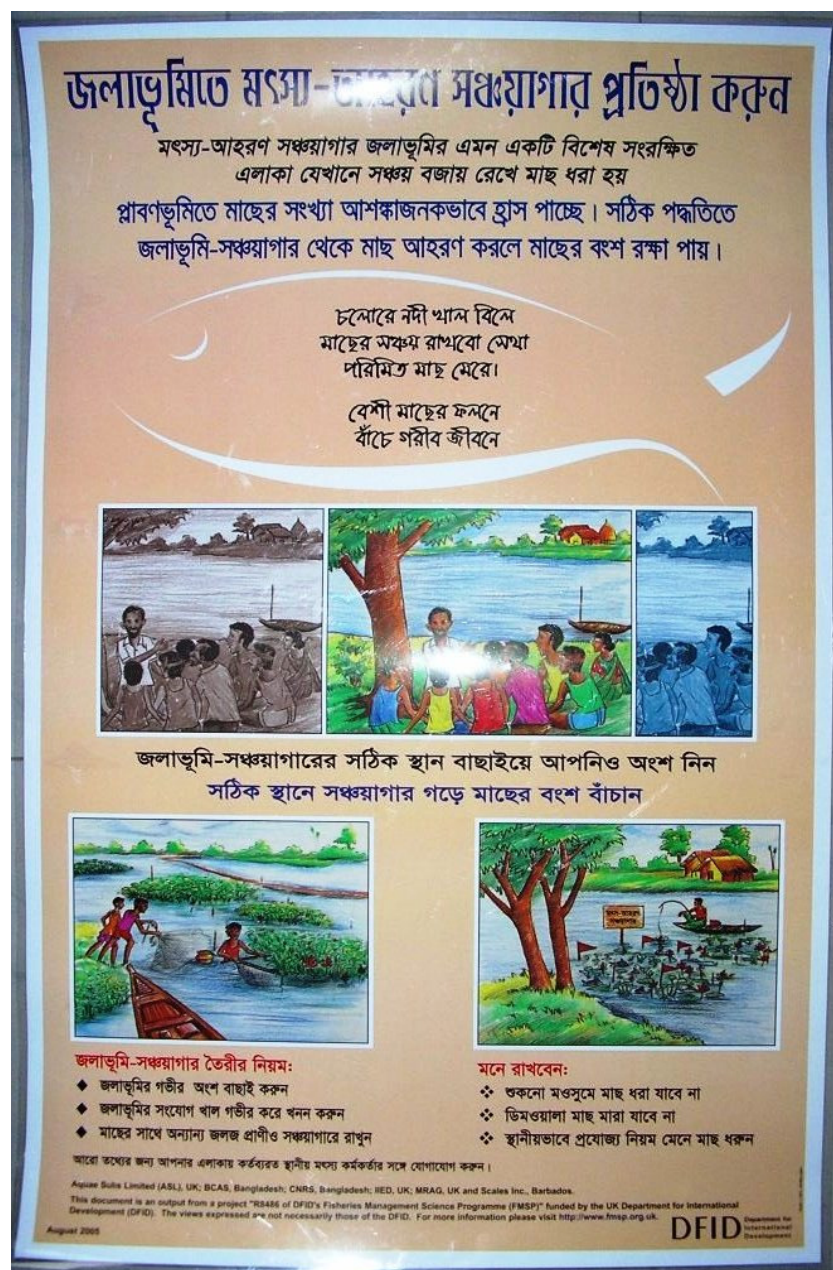


**Billboard 2. Promoting the fish-friendly management of sluice gates in FCDI schemes**

Four boards erected, three at Pabna FMSP field site and one at Tangail

Translation of text: Keep the sluice gate open at the beginning of monsoon during the first flood. For further information contact the fisheries officer.





**Poster 1. Promoting the use of harvest reserves / fish sanctuaries**

1000 copies of each poster produced, laminated, in size 23"x36". Posters displayed at Fish Fair and distributed to DOF, NGOs, fisheries projects, local administrators, academics etc

Translation of text:

Title: Constructing harvest reserve in a suitable place in the water body

Title 2: Fish species are declining in the floodplain. Controlled fishing in the harvest reserve may help to conserve the fish.

Text 2: Rhyme: Lets go to the river and canal

Controlled fishing may help to conserve the fish

Increased fish production may help the poor to survive

Text 3: Take part in the selection process of harvest reserve. Selection criteria: Select the deepest part of the open water body.

For further information contact the fisheries officer



**Poster 2. Promoting the fish-friendly management of sluice gates in FCDI schemes.**

1000 copies of each poster produced, laminated, in size 23"x36". Posters displayed at Fish Fair and distributed to DOF, NGOs, fisheries projects, local administrators, academics etc

Translation of text:

Title: Usefulness of proper management of sluice gate in increased fish production

Text 1: During the first flood in the monsoon all water bodies become full of fish, don't forget to keep the sluice gate open.

Text 2: Sluice manager should keep the gate open as much as possible

Text 3: Fishing on the connecting canal at the beginning of Monsoon should be stopped

Text: 4: Keep some water in the canal during the dry season

The fish production will be increased if the above-mentioned rules are followed properly

For further information contact the fisheries officer



# Floodplain River Fisheries: A Managers Guide

A. S. Halls<sup>1</sup>

## CONTENTS:

<b>1. INTRODUCTION</b>	<b>2</b>
The Management process Co-management: Sharing Responsibilities	
<b>2. FORMULATING MANAGEMENT PLANS</b>	<b>3</b>
Involve Key Stakeholders Formulate and Record the Plan	
<b>3. IMPLEMENTING MANAGEMENT PLANS</b>	<b>4</b>
Enforcing Rules and Re- solving Conflict Monitoring Programmes	
<b>4. EVALUATING MANAGEMENT PLANS</b>	<b>5</b>
Monitoring Performance Explaining Performance Among Site Comparisons	
<b>5. FURTHER GUIDANCE</b>	<b>6</b>
Preparation of this Guide	

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Photo: *Katha* fishing in northwest Bangladesh © A. S Halls

## Purpose and Scope of the Guidelines

This Guide is aimed at Department of Fisheries Staff, particularly those working in the field who are responsible for implementing national fisheries policy through local management plans.

The Guide aims to improve understanding of the management process and offers practical advice on formulating, implementing and evaluating management plans alongside other key stakeholders such as NGO's, local managers and resource users.

The Guide also contains sources of further information and practical advice for undertaking these activities.

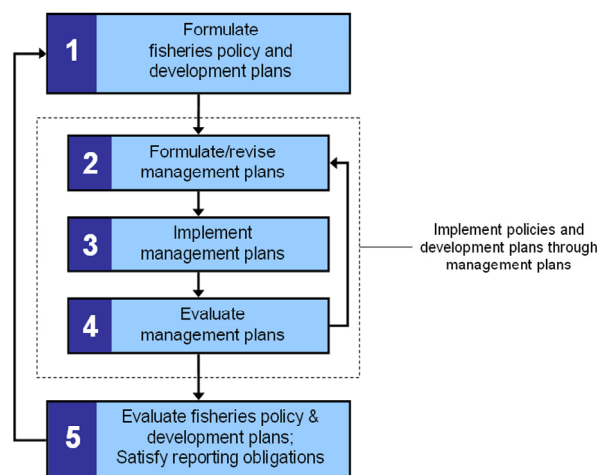
For managers to be effective in their duties, it is important that they share a common understanding of what management is, and exactly what it involves.

### 1.1 The Management Process

Management is a *process* to make fisheries policy and development plans work in real life. Fisheries policy describes the general goals on how resources should be used and managed including co-management arrangements. These goals are implemented through management plans for each fishery, resource or management unit. Management is a cyclical process involving **5 main activities** (Figure 1):

1. Formulating (making) and reviewing fisheries policy and development plans.
2. Formulating and coordinating management plans, which includes setting objectives and management rules and regulations for each fishery, resource or management unit.
3. Implementing plans to meet the management objectives.
4. Evaluating the performance of management plans.
5. Evaluating fisheries policy and development plans and satisfying obligations.

**Figure 1: The Five main activities that form the management process.** Source: Halls *et al.* (in press).



### 1.2 Co-Management - sharing responsibility for management

Co-management, where the responsibility for undertaking these activities is shared with local managers and other key stakeholders such as Non-Government Organisations (NGOs), is becoming increasingly popular in many parts of the world, including Asia. Co-managers, typically the Department for Fisheries (DoF) and resource users represented by some form of local management institution share responsibility for undertaking these activities according to what they can do best often with the support of NGOs and other government organisations. For example, DoF staff may help local managers formulate their management plans and help enforce their rules and regulations. In return, local managers may agree to participate in data collection programmes that will help to ensure they meet their own goals and also meet the reporting responsibilities of DoF staff required for policy evaluation purposes. Field-based managers are most likely to have responsibility for helping to formulate, implement and evaluate local management plans. Therefore, the remainder of this document offers guidance with respect to these three key management activities.

## 2.1 Involve Key Stakeholders

The formulation of a management plan should be undertaken with the involvement of key *stakeholders*, regardless of whether or not the fishery is co-managed. *Stakeholders* are groups of people or organisations that have an interest or role in the management process. Local stakeholders are also likely to be the main source of much of the information required to formulate the plan. *Stakeholder analysis* is a systematic way of identifying key stakeholders. It can provide important information about who will be affected (positively and negatively) by management, who needs to be involved and how they should be involved given their capacity and interest. Sources of further information on stakeholder analysis are provided in Section 5.1

## 2.2 Formulate and Record the Plan

Formulating (making) the plan will involve the following steps. The first five of these steps can be used as the structure for recording the plan (See Section 5 for sources of further guidance):

1. **Describe the resource, environment, fishery, fishers and other stakeholders.** For this, it may be necessary to carry out baseline studies using various approaches including Sustainable Livelihoods Analysis (SLA), Participatory Rural Appraisal (PRA) and frame surveys.
2. **Select local management objectives** that do not conflict with national policy. These might include biological, ecological, and socio-economic related objectives, such as sustaining production and biodiversity, and improving fisher incomes and food security. Bear in mind that some objectives will be incompatible and compromises and priorities will need to be made.
3. **Select management strategies to achieve the objectives** that comply with national legislation. Management strategies are the management control measures (e.g. closed seasons, mesh size regulations, effort restrictions...etc) and interventions such as stocking or habitat enhancement employed to realise the management objectives. The strategy should include details of access rights, existing legislation and sanctions for non-compliance. Sources of guidance for selecting management control measures to achieve different objectives are provided in Section 5.1. These include guidance on selecting harvest reserves and measures to improve yield and biodiversity inside flood control compartments.
4. **Agree the Performance Evaluation Criteria and Decision-Making Arrangements**, including details of the indicators and criteria used to evaluate the performance of the management plan in relation to the specified management objectives, and to adjust or refine the management strategy as necessary (see Section 4). This might also include procedures for consultation and joint decision-making among stakeholders.
5. **Agree on the roles and responsibilities of each stakeholder** to help implement and evaluate the management plan. This should take account of the stakeholder capacities identified during the stakeholder analysis. It is important to describe exactly the area of competence, geographical area, and fish resources each stakeholder is responsible for.
6. **Record the plan.** The management plan should be written down and made available to all stakeholders. Agreeing on a common format for each sector or management unit will make it easier to coordinate different management plans and help make sure that the same explanatory variables are available for management plan evaluation purposes (see Section 4). Maps are a useful way of recording and presenting information contained in the management plan.

The implementation of the management plan involves the actions required to ensure that the management plan is put into operation and operates efficiently. These include monitoring (collecting) and collating data and information necessary to evaluate the performance of the management plan; enforcing measures (rules) designed to achieve the objectives set out in the plan; and helping resolving conflict among stakeholders, different fisheries or management units or between other sectors of the economy that impact on the fisheries (e.g. agriculture, transport, industry... etc).

### 3.1 Enforcing rules and regulations and resolving conflict

DoF staff may have full or partial responsibility for enforcing rules and regulations in support of management strategies. In these cases, staff must have detailed knowledge and understanding of the rules and regulations. Information about the rules and regulations should be fully documented in the management plan and therefore it is important that DoF staff have a copy of each plan. In addition, it may be necessary to compile and maintain up-to-date registers of those fishers and their boats that have been granted access to the fishery (possibly by means of a licence agreement) in an attempt to control fishing effort. Knowledge of these rules and regulations, access rights and details of management jurisdiction described in the management plan will also assist DoF staff resolve conflicts (see Section 5.2 for sources of further guidance).

### 3.2 Designing and Implementing Monitoring Programmes

Monitoring programmes are required for evaluation purposes, or in other words, to determine if the management plan is meeting its objectives and to help managers decide what changes might need to be made to the management strategy to improve performance (see Section 4). As part of the formulation of the management plan, key stages required to design effective and sustainable monitoring programmes include selecting indicators to measure progress towards achieving the management objectives (accompanied by explanatory variables - see Section 4.2), reviewing existing data, selecting data sources and collection methods and exploring opportunities for sharing data and information (Figure 2).

Detailed guidance on how to undertake each stage of the eight-stage design process illustrated in Figure 2 are described by Halls *et al.* (in press) - see Section 5.2.

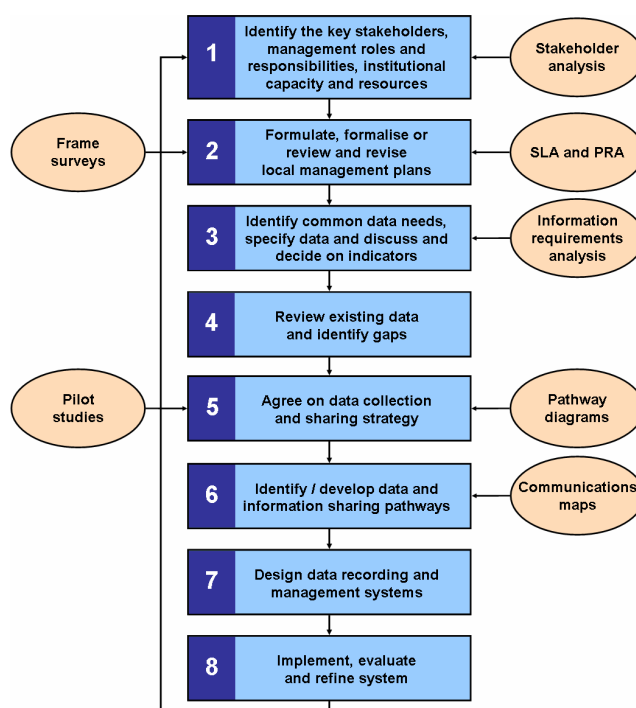
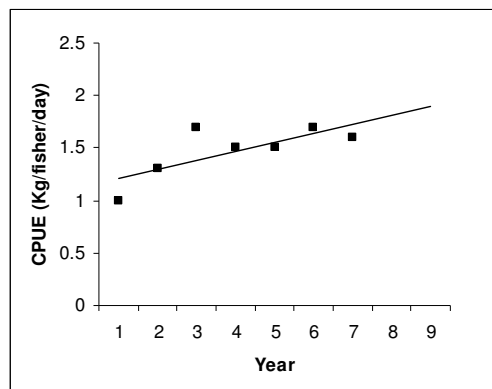


Figure 2: Monitoring programme design stages.  
Source: Halls *et al.* (in press).

### 4.1 Monitoring Performance

The evaluation of the management plan will typically involve monitoring management *performance indicators* through time often against agreed criteria or targets set in accordance with the stated management objectives. Such indicators may include catch per unit effort (CPUE) - an indicator of stock biomass. This performance evaluation exercise is typically undertaken on an annual basis, and followed by a review or adjustment of the plan based upon the outcome of the evaluation.

In Figure 3 for example, average CPUE for a given month has been plotted through time to determine any trend in the value of the indicator. The significance of the trend (either upward or downward) can be tested by fitting a regression model to the time series. A trend is typically judged to be significant when the probability that the slope coefficient is zero is less than 5% ( $\alpha \leq 0.05$ ).



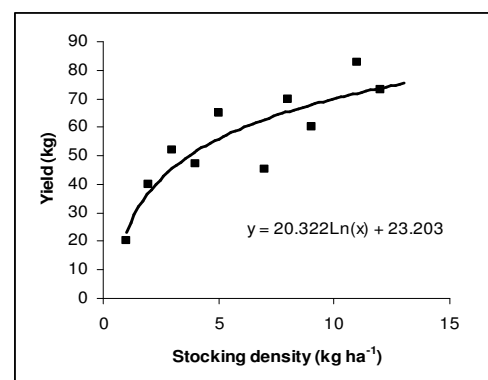
**Figure 3 CPUE plotted as a function of time.** In this example, the probability that the slope coefficient is zero (i.e. no significant upward trend) is less than 1% ( $\alpha = 0.01$ ) implying that the upward trend in CPUE is unlikely to simply reflect random variation.

### 4.2 Explaining Performance

Monitoring performance indicators cannot, by themselves, inform co-managers whether or not the performance of the plan can be improved, or what measures should be taken to make improvements.

To achieve this, inputs to the fishery (e.g. fishing effort or numbers of fish stocked) and other *explanatory variables* (e.g. flood extent) must also be routinely monitored or adequately recorded in the management plan to explain and predict differences in management performance.

Empirical (observation) models of the type illustrated in Figure 4 that link performance indicators and explanatory variables can then be constructed to guide improvements to the plan.



**Figure 4** An example of an empirical model describing the (logarithmic) relationship between yield and stocking density.

### 4.3 Among fishery or management unit comparisons

Refining and improving management strategies on the basis of empirical models developed for specific locations or waterbodies could take years of formal monitoring. DoF staff and researchers can accelerate this *passive adaptive learning* process by comparing performance indicators and explanatory variables among sites, fisheries or management units, constructing empirical models using these data, and feeding back advice or lessons of success and failure to local managers via meetings, or appropriate information networks.

Sources of further guidance on management plan evaluation including the construction of empirical and *analytical* models, and stock assessment are provided in Section 5.3.



### 5.1 Formulating Management Plans

**Management Planning:** Hindson, J., D.D. Hoggarth, M. Krishna, C.C. Mees and C. O'Neill (2005) How to manage a fishery: A simple guide to writing a fishery management plan. MRAG Ltd, UK and Centre for Environmental Education, Allahabad, India. <http://www.fmisp.org.uk/r8468.htm>

**Stakeholder Analysis:** Visit <http://www.iied.org/forestry/tools/four.html> or Annex D of IFAD (2002): <http://www.ifad.org/evaluation/guide/index.htm>.

**Sustainable Livelihoods Analysis:** [http://www.livelihoods.org/info/info\\_guidancesheets.html](http://www.livelihoods.org/info/info_guidancesheets.html)

**Frame Surveys:** See Halls *et al.* (in press) below.

**Participatory Rural Appraisal:** Berkes *et al.* (2001). *Managing small-scale fisheries: Alternative Directions and Methods*, IDRC 2001, 320 p. The book is available online at <http://www.idrc.ca/>. Other sources are cited in Halls *et al.* (in press) below.

**Selecting Management Strategies:** Hoggarth *et al.* (1999). Management Guidelines for Asian Floodplain River Fisheries. *FAO Fisheries Technical Paper*, 384/1&2 FAO, Rome 63pp & 117pp. <http://www.fao.org/DOCREP/006/X1357E/X1357E00.HTM>

**Harvest Reserves:** Hoggarth (2000). Selection Criteria and Co-management Guidelines for River Fishery Harvest Reserves. <http://www.fmisp.org.uk/r7043.htm>. Training Resources: Visit <http://www.fmisp.org.uk/r8486.htm>.

#### Management Strategies to Mitigate Flood Control Impacts:

Halls, A. S. (2005). The Use of Sluice Gates for Stock Enhancement and Diversification of Livelihoods (R8210). Fisheries Assessment Report. MRAG, 75pp. <http://www.fmisp.org.uk/r8285.htm>. For presentation visit: <http://www.fmisp.org.uk/r8486.htm>

### 5.2 Implementing Management Plans

**Designing Monitoring Programmes:** Halls *et al.* (in press). Guidelines for Designing Data Collection and Sharing Systems for Co-Managed Fisheries. Part II: Technical Guidelines. *FAO Fisheries Technical Paper*. No. 494/2. Rome, FAO. 2005. <http://www.fmisp.org.uk/r8462.htm>.

**Co-managing fisheries:** see Hoggarth *et al.* (1999) above.

### 5.3 Evaluating and Refining Management Plans

**Management Plan Evaluation:** see Halls *et al.* (in press) above.

**Adaptive Management:** Visit <http://www.adaptivellearning.info/>

**Stock Assessment:** Hoggarth *et al.* (in press). Stock Assessment for Fishery Management – A Framework Guide to the use of the FMSP Fish Stock Assessment Tools. *FAO Fisheries Technical Paper* No. 487. Rome, FAO. 2005. 261+xvi pp. [http://www.fao.org/fi/cims\\_search/publications\\_form.asp](http://www.fao.org/fi/cims_search/publications_form.asp)

### Preparation of this Document

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**Citation:** Halls, A. S.(2005). *Floodplain River Fisheries: A Managers Guide*. London, MRAG Ltd, 6p.

# পানভূমি-নদীর মৎস্যসম্পদ: ব্যবস্থাপকদের জন্য একটি নির্দেশিকা

এ.এস. হলস<sup>১</sup>

## সূচী

১. ভূমিকা	২
১.১ ব্যবস্থাপনা পদ্ধতি	
১.২ যৌথ ব্যবস্থাপনা: দায়িত্ব বন্টন	
২. ব্যবস্থাপনা পরিকল্পনা প্রণয়ন	৩
২.১ মূল স্টেকহোল্ডারদের সম্পৃক্তকরণ	
২.২ পরিকল্পনা প্রণয়ন এবং লিপিবদ্ধকরণ	
৩. ব্যবস্থাপনা পরিকল্পনা বাস্তবায়ন	৪
৩.১ আইন ও বিধি প্রয়োগ এবং দ্বন্দ্ব নিরসন	
৩.২ পরিবীক্ষণ পরিকল্পনা প্রণয়ন ও কর্মকান্ড পরিবীক্ষণ	
৪. ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন	৫
৪.১ কর্মকান্ডের মান পরিবীক্ষণ	
৪.২ কর্মকান্ডের মান ব্যাখ্যা	
৪.৩ বিভিন্ন সাইট এর তুলনা	
৫. কিছু সহায়ক সূত্র	৬
এই নির্দেশিকাটি প্রস্তুতি প্রক্রিয়া	



চিত্র: কাঠা থেকে মাছ ধরার দৃশ্য, বাংলাদেশ

© A. S. Halls

## এই নির্দেশিকার উদ্দেশ্য এবং ব্যক্তি/আওতা

এই নির্দেশিকাটি মৎস্য বিভাগের কর্মীদের জন্য তৈরি করা হয়েছে, বিশেষকরে যারা মাঠ পর্যায়ে স্থানীয় ব্যবস্থাপনা পরিকল্পনার মাধ্যমে জাতীয় মৎস্য নীতিমালা বাস্তবায়ন করে থাকেন।

এই নির্দেশিকাটির লক্ষ্য হচ্ছে মৎস্য বিভাগীয় কর্মীদের পাশাপাশি অন্যান্য সকল মূল স্টেকহোল্ডার যেমন এনজিও, স্থানীয় ব্যবস্থাপক এবং সম্পদ ব্যবহারকারীদের ব্যবস্থাপনা প্রক্রিয়া সম্পর্কিত ধারণা বৃদ্ধি করা এবং ব্যবস্থাপনা পরিকল্পনা তৈরি, বাস্তবায়ন এবং মূল্যায়নে বাস্তব সম্মত কিছু উপদেশ প্রদান করা।

এই নির্দেশিকায় উপরোক্ত সমস্ত কাজের প্রয়োজনীয় বাস্তব সম্মত পরামর্শ এবং আরও তথ্যের উৎস দেয়া আছে।

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## অধ্যায় ১

## ভূমিকা

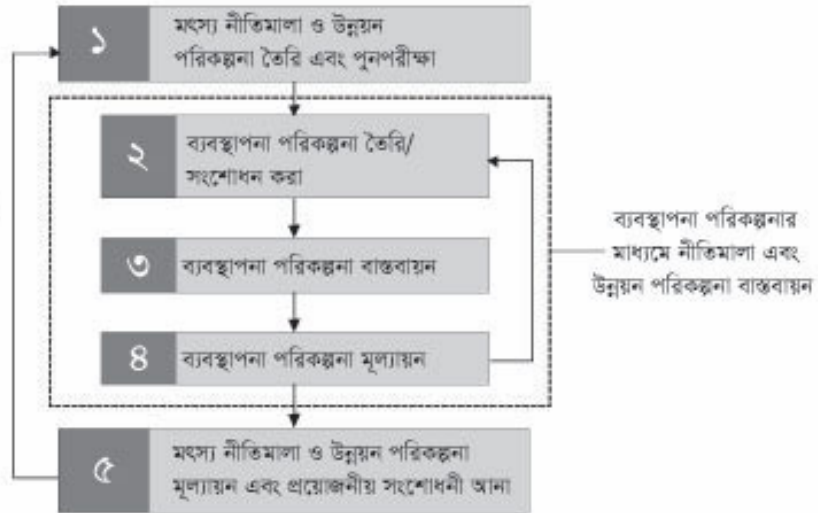
ব্যবস্থাপকদের দায়িত্ব কার্যকরভাবে পালনের জন্য ব্যবস্থাপনা কি এবং এতে কি কি জড়িত এ ব্যাপারে একটি সাধারণ ধারণা থাকতে হবে।

## ১.১ ব্যবস্থাপনা পদ্ধতি

ব্যবস্থাপনা হচ্ছে মৎস্যনীতিমালা এবং উন্নয়ন পরিকল্পনা বাস্তবায়নের একটি পদ্ধতি। মৎস্য নীতিমালাতে কিভাবে সম্পদ ব্যবহার এবং ব্যবস্থাপনা করা উচিত এবং যৌথ ব্যবস্থাপনা কিভাবে হবে তার একটি সার্বিক রূপরেখা বর্ণিত থাকবে। এই লক্ষ্য সমূহই এক একটি জলমহাল, সম্পদ বা ব্যবস্থাপনা কর্তৃপক্ষ কর্তৃক তাদের ব্যবস্থাপনা পরিকল্পনার মাধ্যমে বাস্তবায়িত হবে। ব্যবস্থাপনা একটি চক্রাকার প্রক্রিয়া যাতে পাঁচটি মূল কর্মকান্ড অন্তর্ভুক্ত (চিত্র ১):

১. মৎস্য নীতিমালা ও উন্নয়ন পরিকল্পনা প্রণয়ন এবং পুনরীক্ষা।
২. ব্যবস্থাপনা পরিকল্পনা প্রণয়ন এবং সমন্বয় করা যাতে প্রতিটি জলমহাল, সম্পদ বা ব্যবস্থাপনা ইউনিটের জন্য উদ্দেশ্য নির্ধারণ এবং ব্যবস্থাপনা নিয়মনীতি অন্তর্ভুক্ত থাকবে।
৩. ব্যবস্থাপনা উদ্দেশ্য অর্জনের জন্য পরিকল্পনা বাস্তবায়ন।
৪. ব্যবস্থাপনা পরিকল্পনা বাস্তবায়ন মূল্যায়ন।
৫. মৎস্য নীতিমালা এবং উন্নয়ন পরিকল্পনা মূল্যায়ন এবং প্রয়োজনীয় ব্যবস্থা গ্রহণ।

চিত্র ১: ব্যবস্থাপনা প্রক্রিয়ার  
পাঁচটি মূল ধাপ।  
উৎস: Halls *et al.* (in press).



## ১.২ যৌথ ব্যবস্থাপনা: দায়িত্ব বন্টন

এশিয়াসহ বিশ্বের বিভিন্ন দেশে যৌথ ব্যবস্থাপনা জনপ্রিয়তা লাভ করেছে, যেখানে কর্মকান্ড বাস্তবায়নের দায়িত্ব স্থানীয় ব্যবস্থাপকদের সাথে অন্যান্য হিসাবদার যেমন বেসরকারি সংস্থার (এনজিও) সাথে ভাগাভাগি করার সুযোগ আছে। যৌথ ব্যবস্থাপকবৃন্দ, এক্ষেত্রে মৎস্য বিভাগ সম্পদ ব্যবহারকারীদের স্থানীয় ব্যবস্থাপনা সংগঠন বা প্রতিষ্ঠানের সাথে দায়িত্ব ভাগাভাগি করে এনজিও কিংবা অন্য কোন সরকারি সংস্থার সহযোগিতায় যথাসম্ভব সুষ্ঠুভাবে কার্য সম্পাদন করতে পারে। যেমন মৎস্য বিভাগের কর্মীরা স্থানীয় ব্যবস্থাপকদের ব্যবস্থাপনা পরিকল্পনা তৈরি এবং তাদের নিয়ম-নীতি প্রয়োগে সহযোগিতা করতে পারে। বিনিময়ে স্থানীয় ব্যবস্থাপকবৃন্দ উপাত্ত সংগ্রহের কাজ করতে পারে, যা তাদের সঠিক লক্ষ্যে পৌছাতে সাহায্য করবে এবং নীতিমালা মূল্যায়নের লক্ষ্যে মৎস্য বিভাগের কর্মীদের প্রতিবেদন তৈরির কাজে সহায়ক হবে। মার্কপার্মারের ব্যবস্থাপকদের মূল দায়িত্ব থাকবে স্থানীয় ব্যবস্থাপনা পরিকল্পনা তৈরি, বাস্তবায়ন এবং মূল্যায়ন করা। সেজন্যই এই গাইডটির বাকি অংশে এই তিনটি ব্যবস্থাপনা কার্যক্রমের আলোকেই নির্দেশনা প্রদত্ত হয়েছে।



## ব্যবস্থাপনা পরিকল্পনা প্রণয়ন

### ২.১ মূল স্টেকহোল্ডারদের সম্পৃক্তকরণ

জলমহালটি যৌথ ব্যবস্থাপনায় থাকুক বা না থাকুক ব্যবস্থাপনা পরিকল্পনা তৈরি করার সময় মূল স্টেকহোল্ডারদের সম্পৃক্ত করতে হবে। এই ব্যবস্থাপনা প্রক্রিয়ায় ভূমিকা বা আদ্রহ আছে এমন ব্যক্তিবর্গ বা সংস্থাই হচ্ছে স্টেকহোল্ডার। ব্যবস্থাপনা পরিকল্পনা তৈরীর ক্ষেত্রে স্থানীয় স্টেকহোল্ডাররাই অধিকাংশ তথ্যের মূল উৎস হয়ে থাকে। মূল স্টেকহোল্ডার চিহ্নিত করার ধারাবাহিক প্রকৃয়া হচ্ছে স্টেকহোল্ডার বিশেষণ। এই বিশেষণের মাধ্যমেই জানা যেতে পারে ব্যবস্থাপনা পরিকল্পনা বাস্তবায়িত হলে কারা কারা উপকৃত হবে বা কারা ক্ষতিগ্রস্ত হবে এবং আদ্রহ এবং দক্ষতা বিবেচনায় কাদের, কিভাবে এর সাথে সম্পৃক্ত করতে হবে। অধ্যায় ৫.১ এ স্টেকহোল্ডার বিশেষণের আরও তথ্য সূত্র দেয়া হয়েছে।

### ২.২ পরিকল্পনা প্রণয়ন এবং লিপিবদ্ধকরণ

নিম্নবর্ণিত ধাপগুলির অনুসরণে একটি ব্যবস্থাপনা পরিকল্পনা তৈরি করা যেতে পারে। এদের প্রথম পাঁচটি ধাপকে পরিকল্পনাটি তৈরি এবং রেকর্ড করার কাজে ব্যবহার যেতে পারে (আরও তথ্য সূত্রের জন্য অধ্যায় ৫ দেখুন)।

**১. সম্পদ, পরিবেশ, জলমহাল, মৎস্যজীবী এবং অন্যান্য স্টেকহোল্ডার ইত্যাদির বর্ণনা।** এই তথ্য সংগ্রহের জন্য Sustainable livelihood Annalysis (SLA), Participatory Rural Appraisal (PRA) এবং কাঠামো জরিপ ইত্যাদি পদ্ধতি ব্যবহার করে ভিত্তি জরিপ করার প্রয়োজন হতে পারে।

**২. স্থানীয় পর্যায়ে জাতীয় নীতিমালার অনুকূল ব্যবস্থাপনার উদ্দেশ্যে নির্ধারণ।** এগুলো জৈবিক, প্রতিবেশগত কিংবা আর্থ-সামাজিক সম্পর্কিত উদ্দেশ্য যেমন টেকসই উৎপাদন এবং জীববৈচিত্র্য বা মৎস্যজীবীদের আয় বৃদ্ধি এবং খাদ্যের নিশ্চয়তা ইত্যাদি হতে পারে। মনে রাখতে হবে যে কিছু কিছু উদ্দেশ্য অসংগত হতে পারে। সে ক্ষেত্রে কিছুটা নমনীয় হতে হবে কিংবা অগ্রাধিকার বিবেচনা করতে হবে।

**৩. উদ্দেশ্যসমূহ অর্জনের জন্য ব্যবস্থাপনা কৌশল নির্ধারণ।** এগুলো জাতীয় নীতিমালার সহিত সঙ্গতিপূর্ণ হতে হবে। এই ব্যবস্থাপনা কৌশলগুলোমূলত: বিভিন্ন ধরনের নিয়ন্ত্রণ ব্যবস্থাপনা (যেমন জালের ফাসের আকৃতি নিয়ন্ত্রণ, মৎস্য আহরণ নিয়ন্ত্রণ, মাছ ধরা নিয়ন্ত্রণ ইত্যাদি) এবং অন্যান্য কার্যক্রম যেমন বিরল প্রজাতির পোনা অবমুক্তকরণ, আবাস উন্নয়ন ইত্যাদি ব্যবস্থাপনা উদ্দেশ্যের আলোকে হতে হবে। এই কৌশলে জেলোদের সম্পদ ব্যবহারের অধিকার, বিদ্যমান আইন এবং শাস্তির বিধান বিশদভাবে উল্লেখ থাকবে। অধ্যায় ৫.১ এ ব্যবস্থাপনা নিয়ন্ত্রণের অনেকগুলো পদ্ধতি নির্দেশিকা সূত্র দেয়া আছে যা নির্দিষ্ট উদ্দেশ্যে অর্জনে সহায়ক হবে। সেখানে বন্যা নিয়ন্ত্রণ বাঁধের ভিতরে Harvest Reserves নির্বাচন, উৎপাদন ও জীববৈচিত্র্য বজায় রাখা ইত্যাদি ব্যাপারে দিক নির্দেশনা আছে।

**৪. বাস্তবায়িত কার্যক্রমের মূল্যায়ন সংক্রান্ত নির্দেশক এবং সিদ্ধান্ত গ্রহণ পদ্ধতির ক্ষেত্রে সমঝোতা।** এছাড়াও ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন করার জন্য নির্দেশক এবং বৈশিষ্ট্যসমূহ বিস্তারিতভাবে নির্ধারণ করতে হবে যাতে এটি উদ্দেশ্য অর্জনে সফল হচ্ছে কিনা তা মূল্যায়ন করা যায় এবং প্রয়োজনে এর পরিবর্তন করা যায় (অধ্যায় ৪ দেখুন)। এতে স্টেকহোল্ডারদের পরামর্শ গ্রহণ এবং যৌথ সিদ্ধান্ত গ্রহণের প্রক্রিয়া অন্তর্ভুক্ত থাকবে।

**৫. ব্যবস্থাপনা পরিকল্পনা বাস্তবায়ন এবং মূল্যায়নের ক্ষেত্রে প্রত্যেক স্টেকহোল্ডারদের দায়িত্ব এবং কর্তব্য নির্ধারণ করতে হবে।** এক্ষেত্রে স্টেকহোল্ডার বিশেষণের সময় তাদের দক্ষতা জেনে নিতে হবে। সংশ্লিষ্ট স্টেকহোল্ডারদের যোগ্যতা, সম্পদের অবস্থাগত বর্ণনা বিশদভাবে থাকতে হবে।

**৬. পরিকল্পনা লিপিবদ্ধকরণ।** প্রণয়নকৃত ব্যবস্থাপনা পরিকল্পনাটি ধারাবাহিকভাবে লিপিবদ্ধ করতে হবে এবং সকল স্টেকহোল্ডারকে সরবরাহ করতে হবে। সকলে মিলে একটি নির্দিষ্ট ছকে এটি লিপিবদ্ধ করতে হবে যেন সকলে একইভাবে বুঝতে পারে, বিভিন্ন ব্যবস্থাপনা পরিকল্পনার মাঝে সমন্বয় করা যায় এবং মূল্যায়নের জন্য একই ধরনের Variable ব্যবহার করা যায় (অধ্যায় ৪ দেখুন)। ব্যবস্থাপনা পরিকল্পনার তথ্য সন্নিবেশ করা এবং উপস্থাপনের জন্য মানচিত্র একটি উপযোগী মাধ্যম।

## অধ্যায় ৩

# ব্যবস্থাপনা পরিকল্পনা বাস্তবায়ন

ব্যবস্থাপনা পরিকল্পনাটির সূচ্য বাস্তবায়ন নিশ্চিত করার জন্য বেশ কিছু কার্যক্রম গ্রহণ করতে হবে। এর মধ্যে আছে পরীক্ষণ (উপাত্ত সংগ্রহ) এবং যাচাই এর মাধ্যমে ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন, উদ্দেশ্য অর্জনে গৃহীত ব্যবস্থাপনা কার্যক্রম বাস্তবায়ন এবং মৎস্য বা ব্যবস্থাপনা সম্পর্কিত এবং মৎস্য ব্যবস্থাপনার প্রভাব ফেলে এমন অর্থনৈতিক সেক্টর স্টেকহোল্ডারদের (কৃষক, পরিবহন, শিল্প) মাঝে দ্বন্দ্ব সৃষ্টি হলে তা নিরসনে সহযোগিতা করা।

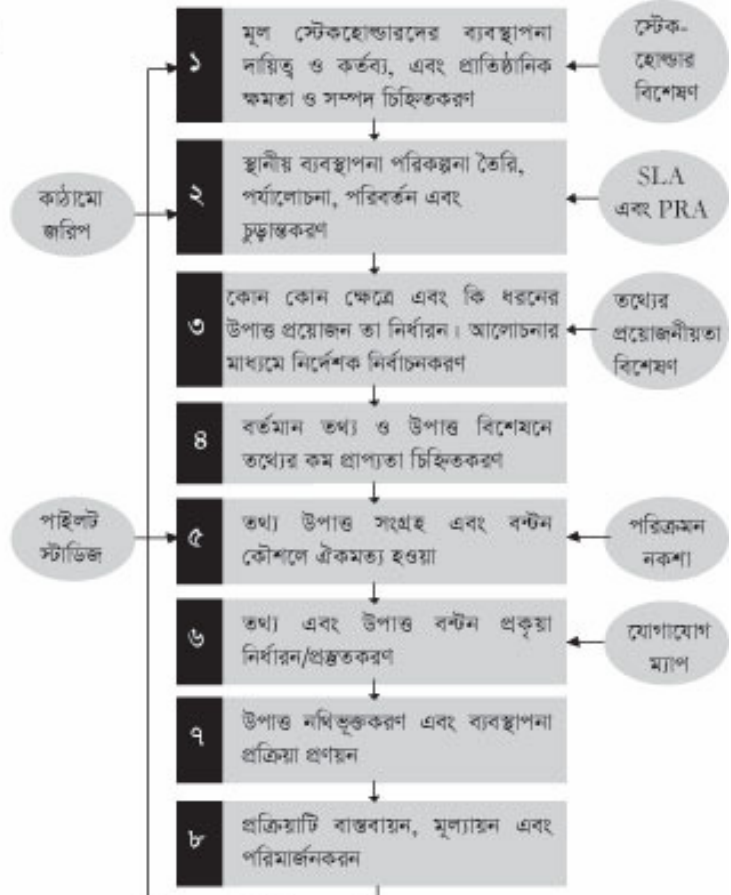
### ৩.১ আইন ও বিধি প্রয়োগ এবং দ্বন্দ্ব নিরসন

ব্যবস্থাপনা কৌশল এর অন্তর্ভুক্ত আইন ও বিধি প্রয়োগে মৎস্য অধিদপ্তরের কর্মীদের সার্বিক বা আংশিক দায়িত্ব থাকতে পারে। সেক্ষেত্রে ঐ সমস্ত কর্মীদের সংশ্লিষ্ট আইন ও বিধি সম্পর্কে পরিষ্কার জ্ঞান থাকতে হবে। আইন ও বিধি সংক্রান্ত সকল তথ্য ব্যবস্থাপনা পরিকল্পনাতে সম্পূর্ণভাবে লিপিবদ্ধ থাকবে এবং তার অনুলিপি মৎস্য বিভাগের কর্মীদের কাছে থাকবে। এছাড়াও মৎস্য আহরণ নিয়ন্ত্রণে যে সমস্ত মৎস্যজীবীদের মাছ ধরার অনুমোদন (লাইসেন্স এর মাধ্যমে) দেয়া হয়েছে, তাদের ব্যবহৃত নৌকা এবং সরঞ্জাম এর তালিকার একটি রেজিস্টার তৈরি এবং তা হালনাগাদ করে রাখতে হবে। এ সমস্ত আইন ও বিধি, সম্পদ ব্যবহার অধিকার এবং ব্যবস্থাপনা আওতা সংক্রান্ত বিস্তারিত জ্ঞান মৎস্য বিভাগের কর্মীদের থাকতে হবে যা তাদের দ্বন্দ্ব নিরসনে সহায়তা করবে (আরও তথ্যের জন্য অধ্যায় ৫.২ দেখুন)।

### ৩.২ পরিবীক্ষণ পরিকল্পনা প্রণয়ন এবং কর্মকান্ড পরিবীক্ষণ

কার্যক্রম মূল্যায়নের জন্য পরিবীক্ষণ কর্মকান্ড প্রয়োজন হয়। অন্য কথায় ব্যবস্থাপনা পরিকল্পনা তার উদ্দেশ্য অর্জন করছে কিনা, এতে কোন পরিবর্তন প্রয়োজন কিনা, হলে কি পরিবর্তন ইত্যাদি জেনে কার্যক্রম মান সম্মত করার জন্য পরিবীক্ষণ কর্মকান্ড জরুরী (অধ্যায় ৪ দেখুন)। ব্যবস্থাপনা উদ্দেশ্য অর্জনের অগ্রগতি নিরূপনের জন্য নির্দেশক নির্বাচন (ব্যাখ্যামূলক উপযোগ সহ অধ্যায় ৪.২ দেখুন)। বর্তমান উপাত্ত সমূহ পর্যালোচনা, উপাত্ত সংগ্রহের উৎস নির্বাচন, সংগ্রহ পদ্ধতি এবং তথ্য ও উপাত্ত বন্টন এর সুযোগ অনুসন্ধান করা (চিত্র ২)।

আট ধাপ বিশিষ্ট পরিবীক্ষণ পদ্ধতি প্রণয়নের প্রক্রিয়ার প্রতিটি ধাপ চিত্র ২ এ উপস্থাপন করা হল। অধ্যায় ৫.২ এ উল্লিখিত Halls *et al.* (in press) বইতে এই ধাপগুলোর বিশদ বর্ণনা পাওয়া যাবে।



চিত্র ২: পরিবীক্ষণ কার্যক্রম প্রণয়নের ধাপসমূহ (সূত্র: Halls *et al.* (in press))।



## অধ্যায় ৪

## ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন

## ৪.১ কর্মকাণ্ডের মান পরিবীক্ষণ

সাধারণত: সময়ের সাথে ব্যবস্থাপনার উদ্দেশ্য অর্জনের নির্দেশকের পরিবর্তন যাচাই করে ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন করা হয়। যেমন ১ জন জেলে দিনে কি পরিমাণ মাছ ধরছে (Catch per unit effort, CPUE) তা জলাভূমির মাছের প্রাপ্যতার নির্দেশক। এ ধরনের মূল্যায়ন বাৎসরিক হয়ে থাকে, যার মাধ্যমে ব্যবস্থাপনা পরিকল্পনা পর্যালোচনা এবং প্রয়োজনে পরিবর্তন করা যায়।

চিত্র ৩ এ নির্দেশকের মান এর বোঝা দেখানোর জন্য উদাহরণ হিসাবে কোন এক বছরের উৎপাদন বোঝা দেখানো হয়েছে। সময়ের সাথে রিগ্রেশন মডেল এর মাধ্যমে উৎপাদনের ধারার গুরুত্ব (উর্ধ্ব বা নিম্নমুখী) পরীক্ষা করা যেতে পারে। যখন এই বোঝা এর সম্ভাব্যতা শূন্য বা ৫% এর চেয়ে কম ( $\alpha \leq 0.05$ ) হয় তখন উক্ত বোঝাকে উল্লেখযোগ্য ধরা হয়।

উৎপাদন রেখা উর্ধ্বমুখী হলে উৎপাদন বাড়ছে বুঝা যাবে। সমান্তরাল বা নিম্নমুখী হলে বুঝতে হবে যে উৎপাদন এক পর্যায়ে আছে বা কমছে।

## ৪.২ কর্মকাণ্ডের মান ব্যাখ্যা

গুরু পরিবীক্ষণ নির্দেশকসমূহ দ্বারা ব্যবস্থাপকরা বুঝতে পারবেন না যে ব্যবস্থাপনা পরিকল্পনাটি পরিবর্তন/উন্নয়ন করার প্রয়োজন আছে কিনা বা উন্নয়নের জন্য কি ব্যবস্থা নেয়া প্রয়োজন।

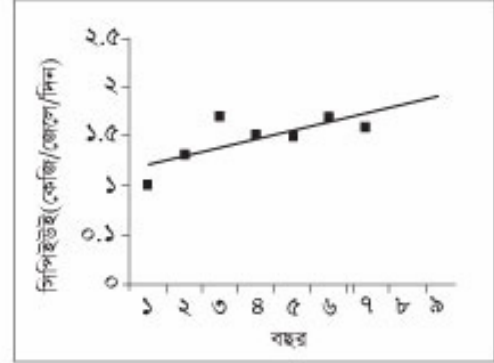
এই উদ্দেশ্যে মৎস্য সংক্রান্ত তথ্য উপাত্ত (যেমন: মাছ আহরণ, মজুদকৃত মাছের সংখ্যা) এবং অন্যান্য ব্যাখ্যাযোগ্য উপাত্ত (যেমন বন্যার মাত্রা) ইত্যাদি নিয়ম মারফিকভাবে সংগ্রহ করে ব্যবস্থাপনা পরিকল্পনায় যুক্ত করতে হবে যাতে ব্যবস্থাপনা মানের পার্থক্য সম্পর্কে ব্যাখ্যা ও পরামর্শ দেয়া যায়।

চিত্র ৪ এ প্রদত্ত মডেল অনুসারে কার্য সম্পাদন নির্দেশক ও ব্যাখ্যামূলক বিষয় যুক্ত করে ব্যবস্থাপনা পরিকল্পনা উন্নয়নের নির্দেশনা পাওয়া যাবে।

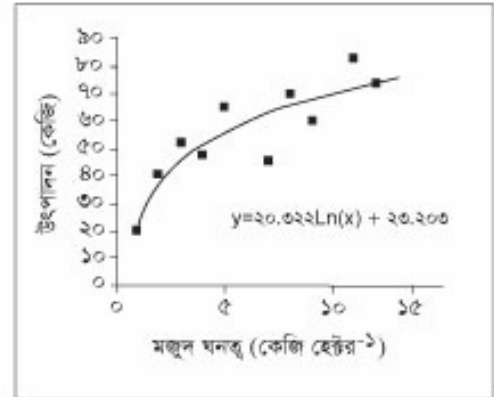
## ৪.৩ বিভিন্ন সাইট এর তুলনা

স্থান ভিত্তিক পর্যবেক্ষণ মডেলের মাধ্যমে একটি ব্যবস্থাপনা কৌশল পর্যবেক্ষণ এবং উন্নয়নের জন্য বেশ কয়েক বৎসরের পরীক্ষণ উপাত্তের প্রয়োজন হতে পারে। মৎস্য বিভাগের কর্মীবৃন্দ এবং গবেষকগণ বিভিন্ন জলমহাল বা ব্যবস্থাপনা ইউনিটের প্রাপ্ত নির্দেশক ও ব্যাখ্যামূলক উৎপাদনের মাঝে তুলনা করে এবং এ সকল তথ্য ব্যবহার করে অভিজ্ঞতা ভিত্তিক মডেল তৈরি করে আলোচনা সভা বা উপযুক্ত তথ্য নেটওয়ার্কের মাধ্যমে স্থানীয় ব্যবস্থাপকদের কার্যক্রমের সফলতা ও অকৃতকার্যতার শিক্ষণীয় বিষয় অবহিত করে এই অভিযোজন উপযোগী শিক্ষণ প্রক্রিয়াটি ত্বরান্বিত করতে পারেন।

ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন এবং অভিজ্ঞতা ও পর্যবেক্ষণ ভিত্তিক মডেল, বিশেষণধর্মী মডেল, মজুদ নির্ণয় প্রক্রিয়া ইত্যাদির আরও সূত্র অধ্যায় ৫.৩ এ দেয়া হল।



চিত্র ৩: সময়ের সাথে CPUE পট করা হয়েছে। এই উদাহরণে সম্ভাব্য slope coefficient শূন্য (উল্লেখযোগ্য কোন উর্ধ্বগতি নাই) বা ১% চেয়ে কম ( $\alpha = 0.01$ )। এতে CPUE এর উর্ধ্বগতি কোন পরিবর্তন নেই বুঝা যায়।



চিত্র ৪: একটি ইম্পিরিক্যাল মডেল এর উদাহরণ যেখানে উৎপাদন এবং মজুদ ঘনত্বের মধ্যে বিদ্যমান সম্পর্ক দেখান হয়েছে।

## কিছু সহায়ক সূত্র

**৫.১ ব্যবস্থাপনা পরিকল্পনা প্রণয়ন সংক্রান্ত**

**Management Planning:** Hindson, J., D. D. Hoggarth, M. Krishna, C. C. Mees and C. O'Neill (2005) How to manage a fishery: A simple guide to writing a fishery management plan. MRAG Ltd., UK and Centre for Environmental Education, Allahabad, India. <http://www.fmisp.org.uk/r8468.htm>

**Stakeholder Analysis:** Visit <http://www.iied.org/forestry/tools/four.html> or Annex D of IFAD (2002): <http://www.ifad.org/evaluation/guide/index.htm>.

**Sustainable Livelihoods Analysis:** [http://www.livelihoods.org/info/info\\_guidancesheets.html](http://www.livelihoods.org/info/info_guidancesheets.html)

**Frame Surveys:** See Halls et al. (in press) below

**Participatory Rural Appraisal:** Berkes et al. (2001) *Managing small-scale fisheries*. Alternative Directions and Methods, IDRC 2001, 320 p. The book is available online at <http://www.widrc.ca/other> sources are cited in Halls et al. (in press) below:

**Selecting Management Strategies:** Hoggarth et al. (1999). Management Guidelines for Asian Floodplain River Fisheries. FAO Fisheries Technical Paper, 384/1&2 FAO Rome 63pp & 117pp. <http://www.fao.org.uk/DOCREP/006/X1357E/X1357E00.HTM>

**Harvest Reserves:** Hoggarth (2000). Selection Criteria and Co-management Guidelines for River Fishery Harvest Reserves. <http://www.fmisp.org.uk/r7043.htm>. Training Resources: Visit <http://www.fmisp.org.uk/r8486.htm>

**Management Strategies to Mitigate Flood Control Impacts:**

Halls, A. S. (2005). The Use of Sluice Gates for Stock Enhancement and Diversification of Livelihoods (R8210). Fisheries Assessment Report. MRAG , 75 pp. <http://www.fmisp.org.uk/r8285.htm>. For presentation visit: <http://www.fmisp.org.uk/r8486.htm>.

**৫.২ ব্যবস্থাপনা পরিকল্পনা বাস্তবায়ন সংক্রান্ত**

**Designing Monitoring Programmes:** Halls et al. (in press). Guidelines for Designing Data Collection and Sharing Systems for Co-Managed Fisheries. Part II: Technical Guidelines. FAO Fisheries Technical Paper. No. 494/2. Rome, FAO. 2005. <http://www.fmisp.org.uk/r8462.htm>.

**Co-managing fisheries:** see Hoggarth et al. (1999) above.

**৫.৩ ব্যবস্থাপনা পরিকল্পনা মূল্যায়ন এবং পরিমার্জন সংক্রান্ত**

**Management Plan Evaluation:** see Halls et al. (in press) above.

**Adaptive Management:** Visit <http://www.adaptivelearning.info/>

**Stock Assessment:** Hoggarth et al. (in press). Stock Assessment for Fishery Management - A Framework Guide to the use of the FMSP Fish Stock Assessment Tools. FAO Fisheries Technical Paper No. 487. Rome, FAO, 2005. 261+xvi pp.

<http://www.fao.org/fi/cims/search/publications/form.asp>

**এই নির্দেশিকাটি তৈরি প্রক্রিয়া**

এই নির্দেশিকাটি উন্নয়নশীল দেশের জন্য যুক্তরাজ্যের Department for International Development (DFID) এর Fisheries Management Science Programme (FMSP) এর অর্থানুকূলে পরিচালিত প্রকল্প R8486 এর তৈরি। এই নির্দেশিকায় উপস্থাপিত মতামত DFID এর নয়। FMSP, Project R8486 এবং এই কার্যক্রমের আওতায় অন্য কোন প্রকল্প সম্পর্কে জানতে <http://www.fmisp.org.uk> ওয়েব সাইট দেখতে পারেন।

উদ্ধৃতি: Halls, A. S. (2005). Floodplain Fisheries: A Managers Guide. London, MRAG Ltd. 6p



**Article in DOF Fish Fortnight souvenir magazine**

Five page article written in Bangla, with English Abstract as below, published in the National Fish Fortnight Souvenir magazine. Circulation: about 10,000 copies, with souvenir article also submitted to other agencies' newsletters.

**প্লাবন ভূমিতে ধান ও মাছ উৎপাদনে স্লুইস গেটের ব্যবহার**  
**(Use of Sluice Gate for Rice and Fish Production in Modified Floodplains)**

মোঃ লিয়াকত আলী ও সরদার সফিকুল আলম  
 বাংলাদেশ সেন্টার ফর অ্যাডভান্সড স্টাডিজ (বিসিএএস)

**Abstract**

Floodplains play a vital role in the inland fisheries production system and support livelihoods of the rural poor. During rainy season many wild fish species migrate to the floodplain from the main river to spawn and feed offering productive fisheries opportunity. But due to construction of embankment, regulator and sluice gates under FCD / FCDI projects for increasing rice production, the floodplain fisheries have declined and biodiversity have been affected. Livelihoods of the poor fishers have been affected and nutritional level to rural people has dropped, although the FCD / FCDI programmer have produced significant benefit to farmers. Rice production has increased sufficiently leading the country to self-sufficiency in food production. The sluice gate / regulators are mainly used to control water within the FCD project areas for rice production only. Studies have shown that the fish can enter the modified floodplain area and through proper management and operation of sluice gates fish stock could be enhanced in the modified floodplain. But information and guidelines on how best to operate the sluice gate during hydrological cycle to increase in the recruitment are yet to be developed.

Therefore in order to develop guidelines / protocols for proper management and operation of sluice gates that would help enhance fish migration into the floodplains without any harm rice production, a DFID financed project entitled "The use of sluice gate for fish stock enhancement and diversification of livelihood" was undertaken during 2003 and 2004 by BCAS, IIED & MRAG, UK in two water management project areas namely RIPDP and CPP with 3 sluice gates. This paper highlights the key findings of the above study and the guidelines / protocols for management & operation of sluice gate for fish stock enhancement in the modified floodplains including key communication messages developed under another on going DFID funded project "Promotion of FMSP Guideline for Floodplains Fisheries Management and Sluice Gate Control". The key messages for management and operation of sluice gates/regulators for fish stock enhancement in the modified floodplain are:

- (1) Sluice gates be opened to maximize inward flow of water during rising flood to facilitate migration of juvenile fish and spawning fish into the floodplain area
- (2) Sluice gate be opened as frequently as possible & during early flood turbulence out side the gate be minimized.
- (3) During ebb flood current velocity be controlled to enable the fish migrate against current.
- (4) Crop diversification be practiced to introduce such crops as could be harvested before flood and crop requiring less irrigation water compared to rice.
- (5) Fishing in the canal/river linking main river with sluice gate be controlled / reduced as more than 50% of fishes are caught before they research the sluice gate.
- (6) Sluice gate management committee need to be strengthened and be represented by more grass root level relevant stakeholders.
- (7) Sluice gate specific operation guidelines be developed.



## Outreach Programme of DFID-FMSP for Management Floodplain Fisheries

Floodplains play a vital role in the inland fisheries production system by supporting livelihoods and providing nutrition to the rural poor. But the floodplain fisheries had declined significantly during the last few decades due to manmade and natural causes such as over fishing in absence of any good management practices, loss and degradation of fish habitats by construction of embankment and Sluice Gates under FCD and FCDI projects. The government agencies, Non-Government Organization and development partners in Bangladesh have undertaken a number of initiatives to increase fish production and to meet the growing demands of fish. The Department for International Development (DFID) of UK is one of the major development partners for Bangladesh and it has provided assistance for conducting a number of projects under its "Fisheries Management Science Programme" (FMSP) and "Natural Resources Systems Programme" (NRSP) in the last decade. These projects have generated many important findings and recommendations for fisheries management and strategies to be implemented for benefiting the poor and the ecosystems.

This scientific knowledge of management options for increased fish production and diversification of livelihoods require effective dissemination to reach all stakeholders such as policy makers, programme managers and beneficiaries.

The DFID has initiated such an outreach activity under the "Promotion of FMSP guidelines for floodplain fisheries management and sluice gate control" initiative. The project aimed at outreaching the key findings and recommendations of both FMSP and NRSP projects among the policy planners and relevant stakeholders at all level including local, sub-national, national and regional level stakeholders. Bangladesh Centre for Advanced Studies has jointly implemented the project with Centre for Natural Resources System (CNRS) in Bangladesh. The Marine Resources

Assessment Group, Scales Barbados, Aqua Service Limited (ASL) and International Institute for Environment and Development (IIED) from UK are also collaborating in the implementation of the project.

### Outputs and Communication Channels

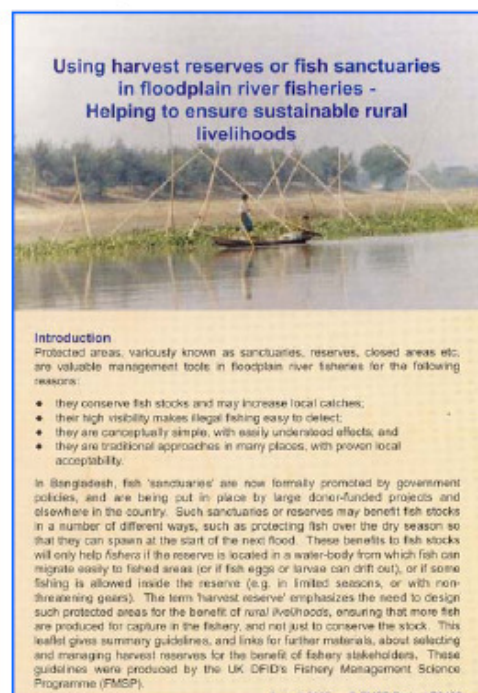
After the reviewing and evaluating the findings of the NRSP and FMSP projects, the following three strategies of floodplain fisheries management for sustainable livelihoods of the poor have been found most pertinent for outreach.

- Management of sluice gate operation for fish stock enhancement within the flood control scheme area/ modified floodplain;
- Establishment of fish harvest reserves / sanctuaries in floodplain rivers; and
- General management guidelines for floodplain river fisheries to ensure sustainable rural livelihoods.

The guidelines for management of floodplain fisheries to ensure sustainable livelihoods of the poor have been developed and disseminated to the relevant stakeholders through different communication mechanisms under this project. The communication mechanism include: awareness raising, policy brief and policy dialogue meeting with key stakeholders, power point packages for trainers, managers guidelines, leaflets, posters, bill boards, newsletters and newspaper articles, street theatre and pot songs, stall in fish fair, article in fish fortnight souvenir, websites (DFID, BCAS & CNRS) and national seminar. The Fisheries Ministers, Secretaries of Fisheries Ministry, Head of relevant government Departments and the key stakeholders attended the seminar in Dhaka.

Three interesting leaflets have been

prepared and distributed among the policy planners, academics, different level of government and non-government officials and institutions.



These are: a) Improving fish catches inside flood control schemes; b) Using harvest reserves or fish sanctuaries in floodplain river fisheries – helping to ensure sustainable rural livelihoods; and c) Management guidelines for Asian floodplain river fisheries – helping to ensure sustainable rural livelihoods.

### Key Messages and Recommendations

The key messages and recommendations extracted from FMSP and FMSP projects and stakeholder discussion in meetings and workshops, for floodplain fisheries management for increased fish production and sustainable livelihoods of the rural poor have been classified under the following categories:

- Sluice gate management for fish stock enhancement and sustainable rural livelihood;
- Harvest reserves or fish sanctuaries in floodplain river

*Management Guidelines for Asian Floodplain River Fisheries*  
By D.D. Hoggarth

Floodplain river resources are both highly valuable and highly vulnerable. Their high biodiversity and natural productivity provide livelihoods in farming, fishing and other sectors, often critically important for the rural poor. Water flows from upstream bring the nutrients that make the resource so productive, but they also bring pollutants and other negative impacts from upstream parts of the river catchment. Increasing uses of the floodplain and competing demands for land and water have reduced the extent of these valuable resources and the benefits they provide in many parts of the world.

With their high human population densities, floodplain river fisheries are particularly heavily exploited in Bangladesh and elsewhere in South and South East Asia. According to FAO statistics, the Asian region produced over 65% of the total world inland fish catch in 2002. Development activities in this region initially focused on building massive flood control systems. These were generally beneficial for agriculture and in preventing localised flooding, but are now recognised as having had negative impacts on fish movements and fishing livelihoods. Although total catches remain high, FMSP and other studies have shown localised declines in both fish production and biodiversity, presumably leading to adverse impacts on the livelihoods of poor fishers. Large, valuable species such as the Indian major carps now comprise only a small proportion of the region's wild fish catch. In the 1990s, development projects spent millions of dollars on re-stocking these depleted carp species in Bangladesh, often to find that only a small part of the benefit was going to the poorest stakeholders. Current development projects in Bangladesh (e.g. the Fourth Fisheries Project, CBFM-2 and MACH) all now promote the use of co-management partnerships in designing and implementing local management arrangements and technical measures that give benefits to local people.

This policy paper briefly describes FMSP work on the management of floodplain river fisheries. This work focused initially on understanding the ecology of these complex resources and describing the impacts of flood control systems. It has since gone on to develop a series of guidelines for managing floodplain fisheries, taking into account the needs of the poor and the other users of this valuable but complex natural system.

**FMSP and other DFID research on floodplain river fisheries**

Floodplain river fisheries have been a major focus of the FMSP since its inception, with 'cluster 9' of the programme including 8 projects on this topic. Several other DFID projects, especially those in the NRSP Land-Water Interface programme, have also researched floodplain systems (see links in the FMSP project R8486 web page).

The biological foundations of the FMSP floodplains programme were laid by projects R5030, R5485 and particularly R5953. Between 1994 and 1997, project R5953 made detailed case studies of 'modified' floodplain fisheries inside flood control, drainage and/or irrigation (FCDI) schemes in Bangladesh. These were compared with control areas outside FCDI schemes in Bangladesh, and with un-modified river fisheries in Indonesia. The project found that fish catches per unit area were 60-104% higher outside the case study FCDI scheme than inside. Outside fish stocks also comprised more species than those inside, with the larger major carps among those most affected. Fish tagging studies showed that the FCDI schemes reduce the accessibility of modified floodplains to migratory species, but do not completely prevent their entry. The project also found, however, that fish diets, feeding rates, growth rates, sizes at maturity and other biological characteristics were similar inside and outside the FCDI schemes. This suggested that the modified floodplains *could* still

produce high fish catches, *if* the abundance of their fish stocks could somehow be increased. Finally the project showed that most fish in Bangladesh are caught before they reach an age of even one year old. A new 'year class' of fish is spawned at the start of each year's flood, but fishing is now so intense that less than 2% of these fish survive each year. Far more fish survive in Indonesia, where fishing is less intensive, but even there, some slow-growing fish species have already become locally extinct. The project concluded that the catches of the poorer landless fishers in Bangladesh could be substantially increased by restricting fishing effort in the dry season to allow more fish to survive and breed each year.

Two management approaches were proposed by project R5953 for increasing natural stocks in the impounded floodplains, particularly as cheap alternatives to fish stocking: the use of 'harvest reserves' to protect spawning stocks especially over the dry season; and the management of flood control sluice gates to maximise the entry of fish to FCDI schemes from waters outside. Detailed guidance on these two management measures were developed by projects R7043 and R8210, as described in the sections below.

The largely biological focus of the FMSP is complemented by the series of integrated systems-based projects undertaken by DFID's Natural Resources Systems Programme (NRSP – see [www.nrsp.org](http://www.nrsp.org)). Among other things, these have looked at methods of maximising joint benefits from multiple resource use in such environments, such as where fish, rice and other crops all compete for the same water. Increases in the natural reproduction of small, self-recruiting species has also been sought by FMSP project R7917 by measures allowing their survival and production in small scale aquaculture ponds, without harming the target culture species.

The knowledge generated in these FMSP and other DFID-funded projects has already contributed to the design and evaluation of major development projects, including the Third and Fourth Fisheries Projects in Bangladesh. The participation of local collaborators in FMSP projects, often from government offices, has increased their capacity for management, especially in Bangladesh and Indonesia. New attitudes towards collaborative management and participation will be particularly useful at this time of increasing decentralisation of management authority in both of these countries. The new Open Water Capture Fisheries Strategy in Bangladesh, developed by the Department of Fisheries and the Fourth Fisheries Project includes many of the FMSP recommendations described below.

Support is still needed at the field level with the implementation of these new policies. Towards this end, the most recent FMSP project R8486 has packaged and promoted key guidelines from the programme in a range of forms. Electronic materials including PowerPoint presentations that may be used or developed for training purposes have been made available on the R8486 page of the FMSP web site (see [www.fmsp.org.uk](http://www.fmsp.org.uk)). Key messages from the projects were promoted in 2005, in Bangladesh, and in West Bengal, India, using a range of communication pathways and media, including seminars, leaflets, posters, drama and 'pot songs', as appropriate to different stakeholder groups.

## **Key messages on the integrated management of floodplain river fisheries**

Results from the earlier FMSP projects up to 1997 were collated and published as FAO Fisheries Technical Paper 384 (Hoggarth et al, 1999). This provided a 'spatial, hierarchical and integrated strategy for adaptive co-management' of floodplain river fisheries. Key policy messages on the 'why, what, who and how' of managing these fisheries are given below. The recommendations are particularly applicable to Asian rivers, but are also generally relevant at a global level.

### *Why manage?*



- Floodplains provide many benefits, both socio-economic and environmental, but are threatened by overuse from a range of competing sectors.
- Management plans need to be adapted to the priority objectives at each site, and must bear in mind the limits imposed by the natural productive capacity of the resource.

### What to manage?

- In this multi-user environment, managers need to consider both the impact of fishing on fish stocks, and the influence of a range of other sectors that use or affect the aquatic environment.
- Floodplain river fish include both 'blackfish' species that survive in the floodplain and migrate only small distances, and more migratory 'whitefish' species. These species have different management ranges and different management needs.

### Who should manage?

- Effective management of floodplain rivers requires a co-management approach, that takes advantage of the skills and capacities of different stakeholders.
- Management roles should be shared both 'hierarchically' between national, regional and local partners, and 'spatially' between different management units in each floodplain catchment.
- Some places will also have better prospects for co-management than others (see guidelines for a checklist of criteria).
- Local people should take the lead in designing management plans for their local blackfish resources, and in enforcing their local rules and monitoring the outcomes.
- Government partners need to co-ordinate the management of whitefish at a catchment level, and legitimize local plans with supporting legislation.
- NGOs may play critical roles both as facilitators and in developing capacity.

### How to manage?

- Floodplain fishery resources should be divided up into manageable 'units' allowing local resource users to control activities within their area.
- Management units should be selected to achieve the maximum possible overlap between the range of authority of the local managers (e.g. a village boundary) and the distribution range of a fish stock (e.g. blackfish residing in a village pond and the surrounding floodplain area).
- Appropriate management measures will be needed in each unit, including measures managing the environment (e.g. restoring habitats, managing sluice gates); managing who can fish (e.g. by waterbody leasing), managing the amount and type of fishing (e.g. mesh size limits, reserves, closed seasons, gear bans) and managing the fish themselves (e.g. by stocking).

## **Selection and management guidelines for harvest reserves/sanctuaries**

Protected areas, variously known as sanctuaries, reserves, closed areas etc, are valuable management tools in floodplain river fisheries for the following reasons:

- they conserve fish stocks and should sustain or increase local catches;
- their high visibility makes illegal fishing easy to detect;
- they are conceptually simple, with easily understood effects; and
- they are traditional approaches in many places, with proven local acceptability.

Working in Indonesia, FMSP project R7043 found that fish stocks in community-managed reserves were 5-21 times more abundant, comprised up to 31 more species and were 5-6 times larger by weight, than at a nearby comparison site that was fished with poison in the dry season (see Hoggarth et al, 2004, for details). The actual benefits at other sites will

depend on the specific ecological conditions and current levels of exploitation.

Sanctuaries or reserves may benefit fish stocks in a number of different ways, such as protecting fish over the dry season so that they can spawn at the start of the next flood. These benefits to fish stocks will only help *fishers* if the reserve is located in a water-body from which fish can migrate easily to fished areas (or if fish eggs or larvae can drift out), or if some fishing is allowed inside the reserve (e.g. in limited seasons, or with non-threatening gears). The term 'harvest reserve' emphasizes the need to design such protected areas for the benefit of *rural livelihoods*, ensuring that more fish are produced for capture in the fishery, and not just to conserve the stock. Key policy messages from the R7043 guidelines (Hoggarth, 2000) are given below.

*Select and manage harvest reserves in collaboration with local people*

- A participatory, co-management approach draws on the knowledge, skills and capacities of resource users, government officers, local development NGOs and other stakeholders, as appropriate in each location.
- Where conditions are suitable for 'co-management', local people should take the lead in the selection of reserves, using their local experience to identify the most suitable water-bodies.

*Manage 'whitefish' at a catchment level and 'blackfish' at a local level*

- Reserves for relatively non-migratory, local 'blackfish' species will mainly increase fish catches within a small local area.
- Reserves designed to protect more migratory, riverine 'whitefish' species may give benefits to the whole river catchment due to their wider dispersal patterns. These reserves may need to be managed by government to avoid local over-exploitation.

*Select reserve locations carefully, considering who will benefit and how*

- Reserve locations should be selected that will give the best possible benefits for *local* people.
- Select several small reserves rather than one large one.
- Include different habitat types to give protection to a range of different fish species and their various life stages.
- Select locations well away from potential sources of pollution (upstream).
- Where reserves are fully closed, leave enough alternative fishing grounds to maintain fishing opportunities for local people.
- Use a water-body that is close to the village(s) involved in its management, so as to reduce the chance of illegal fishing. Management should be easier where reserve water-bodies are fully inside a village boundary.

*Use reserve management rules that are appropriate to local conditions and that will deliver the best overall benefits to stakeholders*

- Harvest reserves in floodplain rivers may either be closed year-round or just for certain seasons or certain gears. What is best will depend on the objectives and the local situation.
- In blackfish reserves, the most dangerous dry-season gears (poison, electric fishing, fish drives and de-watering) should always be restricted to protect the spawning stock over the dry season.

*Manage adaptively – monitor the results, compare with other places, and adapt as needed*

- The best management rules for each location are hard to predict in advance, and need to be found by a process of learning and experience.
- Reserves will be more effective in some places than others, and the number of reserves needed or the relative area that should be set aside will vary.

- Use a long-term, 'adaptive' management style, monitoring your fishery to see if your goals are being met, and meeting regularly with stakeholders to discuss what to do if they are not.

## **Management guidelines for FCDI sluice gates for the benefit of fisheries**

FMSP projects R5953 and R8210 both confirmed that fish can successfully migrate through 'undershot' varieties of sluice gates commonly used in FCDI schemes in Bangladesh. Such sluice gates should therefore be recognised as important structures for increasing the stocks of fish in modified floodplains. The following management guidelines, derived from projects R8210 and R8306 (see Halls, 2005 and Shanker *et al.*, 2004), provide ways of increasing the diversity and catches of fish inside FCDI schemes without requiring either the construction of costly fish passes or any structural changes to existing sluice gates. They are instead designed to be easily implemented with the help of local stakeholders and should have minimal impact on farming livelihoods.

Implementation of these guidelines would require sluice gate operators (often committees of local users) to give priority to fishers as well as farmers and landowners. Fishers' needs have often been ignored by gate operators in the past, but their recognition is now required in Bangladesh by the latest water legislation.

### *Operate sluice gates to maximise the flow of water (and therefore fish) into the flood control scheme during the rising flood period*

- Very large numbers of juvenile and spawning adult fish can enter FCDI schemes via sluice gates with inflowing water.
- Maximising the inflow of water during the rising flood period will enable more fish to enter FCDI schemes and improve both catches and biodiversity.

### *Open sluice gates as frequently as possible and attempt to minimise the turbulence of water outside sluice gates during the rising flood period*

- Both biodiversity and fish production will benefit from more frequent gate openings, particularly during the rising flood period.
- Turbulence in front of sluice gates can act as an obstacle to the induction and smooth passage of fish through the gate.

### *Control ebb flows from sluice gates to attract more fish into FCDI Schemes and to maximize passage success*

- The chances of successful passage of fish through sluice gates during the falling water or ebb season could be increased where possible by ensuring that ebb flow velocities do not exceed the maximum sustainable swimming capacities of inwardly migrating fish and/or by creating ebb flows that attract the most fish towards the sluice gate.

### *Close sluice gates before the end of the ebb season in order to retain more water within FCDI schemes during the dry season*

- Studies have shown that raising average dry season water levels by as little as 25cm can bring significant benefits to fisheries operating inside FCDIs by improving the survival of fish during the dry season, and spawning success at the start of the rainy season.

### *Control fishing activities along channels connecting the sluice gates to the main rivers*

- More than 50% of migrating fish can be caught before they even reach the entrance of sluice gates.
- Controlling fishing activities along channels connecting gates to main rivers is therefore very important, particularly in circumstances where gates remain permanently open.

Encourage cropping strategies with lower water needs, and the retirement of marginal low-lying agricultural land that is prone to early flood risk

- Switching to alternative dry season crops such as wheat or onions that require less irrigation water than the now-common, high-yielding boro rice crops would reduce pressure on dry season water resources that provide critical habitats for resident (non-migratory) floodplain blackfish.
- A greater emphasis on more flood-tolerant Aman rice would also allow for earlier, more frequent opening of sluice gates for longer periods during the rising flood.
- Such adaptive strategies are likely to become increasingly necessary in Bangladesh and other parts of South Asia where precipitation is predicted to increase during the flood season, but decrease during the dry season in response to climate change.

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**Other related links**

For downloads of FMSP communications materials on floodplain river fisheries management, including leaflets, PowerPoint presentations and management guidelines, please see the Project R8486 web page at [www.fmisp.org.uk](http://www.fmisp.org.uk). Related outputs from preceding FMSP floodplains projects are also available on the R5953, R6494, R7043, R7834, R7917, and R8210 pages.

[DFID Natural Resources Systems Programme](#) – for systems-based research projects on floodplain production systems, see the Land-Water Interface sub-programme

[STREAM – Support to Regional Aquatic Resources Management](#)

[oneFish](#) – the internet portal for fisheries research

## Annex 2. Bangladesh promotional activities

### Annex 2.1 BCAS/FMSP stall at Bangladesh DOF Fish Fortnight Fair

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Date: 9 to 17 August 2005

Report prepared by Sarder Shafiqul Alam, Mr. Md. Liaquat Ali and Dr. Mahbub Alam, BCAS.



#### Table of Contents

Introduction	
Communication Process	
Fish Fair	
Arrangement of BCAS-FMSP Stall	
Activities undertaken	
Display	
Posters	
Leaflets	
Printed information materials	
Books and publications	
Registration notebook and visiting card box	
Multimedia presentation	
Materials distribution	
Communicating the participants/visitors	
Back ground information of the participants/visitors	
Opening hours	
Documentation	
Photographs	
Video	
Visitors Registration	
Collection of visiting cards	
Report on the stall at Fish Fair	
Conclusion	

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## **Introduction**

National Fish Fortnight 2005 was officially launched on the 7<sup>th</sup> of August 2005 by the Ministry of Fisheries and Livestock. The Fish Fortnight included diverse range of activities namely, seminars, workshops, round table discussion meeting etc. related to research and awareness raising amongst different stake holders to conserve the fish resources. During the Fish Fortnight, one of the main attractive events was the Fish Fair which has been inaugurated on the 9<sup>th</sup> and continued until 17<sup>th</sup> of August. Shilpakala Academy premise was the venue of the Fish Fortnight which is adjacent to the Department of Fisheries (Matshya Bhavan). The main attraction in the Fish Fair was the open stage where organizers allowed different organization to conduct different cultural activities, namely, street drama, folk songs etc. covering the fisheries related issues. Temporarily constructed stalls on the Fair premise represented different govt., non-govt. organizations, and projects. A large number of visitors visited those stalls everyday where they gathered information about different innovation, advisory services, and development activities dealing with fisheries sector related problems in Bangladesh. The commercial and private entrepreneurs had active participation in the Fish Fair. They took the marketing opportunity by demonstrating different process and selling out fish products. The Bangladesh Centre for Advanced Studies (BCAS) also decorated a stall in the Fish Fair in order to disseminate the FMSP project activities and findings amongst different stakeholders. Therefore, following is an account of BCAS-FMSP stall activities during the Fish Fair.

## **Communication Process**

Any kind of Fair in Bangladesh attracts a lot people. The event like fish fair is different compared to other fairs. From the local stakeholders like fishermen or Farmer to the GOB officials or fisheries scientist or owners of the fisheries industry eagerly wait for this day. People come from distant parts of the country to attend this event. BCAS-FMSP stall in the fish fair was launched to reach this diverse range of audiences. The stall was set up in a way that can attract different audiences simultaneously. Different communication tools were demonstrated in audience friendly way.

## **Fish Fair**

About 63 stalls were allocated to the organizations, projects, commercial fish farms, and interested persons. The fair premises designed with three entrance approaches as roads at the three sides surround it. The main entrance has been located at the southwestern corner. One control room has been allocated for the fair management authority and located at the southwestern corner. From the control room, the information, messages, etc. have been announced to the visitors. A big stage along with covered roof and sitting arrangement of 200 audiences has been constructed at the southeastern corner by the fair authority. Various cultural programs on fisheries awareness campaign has been performed in each evening by different fisheries development projects and other fair participants. Among the participants, the DOF organized three stalls for their different wings. Moreover, they have arranged stalls for their ongoing projects/programs like FFP, CBFM, etc. The other project/program participants, NGOs, commercial fish farmers, fisheries instruments; food and medicine sellers, fish and shrimp sellers, fish fingerlings sellers, fast food and tea corner owner's have also organized their stalls. Therefore, the stall organizers are mainly of DOF, BFDC, Research Group, Wetland Resource Management Group, Aquaculture Group, Hatchery Organizers, Commercial fish growers and sellers, Fast Food and Tea Corners, etc.

## **Fish Fair Inauguration**

The inauguration program of fair was held on 07 August at 10.00 a.m. at the fair stage. The Ministers, MOFL and LGRD, have inaugurated the program along with Secretary, MOFL and DG, DOF and BFRI and other concerned resource persons. In the program, the successful fish farmers, institutions, NGOs have been celebrated by providing the gold medals for their potential contribution for the development of fisheries sector. Thereafter, the Fisheries Minister, Director Generals of DOF and BFRI and Director, Channel-I visited the BCAS-

FMSP stall and observed the communication materials of FMSP and other fisheries and water resource management related books and publications of BCAS. The TV channels viz. BTV, Channel-I and Channel-S have taken coverage of those moments of BCAS-FMSP stall visit and broadcast the same in the news of their channels on the same day.

### **Arrangement of BCAS-FMSP Stall**

A well decorated BCAS stall in the fish fair helps introduce and disseminate the outputs of FMSP Project (R8486). The visitors had scopes to get informed regarding the benefits of the “Harvest Reserve” and the “Sluice Gate Management” as these were the part of the communication activities of the project “Promotion of FMSP Guideline for Floodplain Fisheries Management and Sluice Gate Control”. The findings of the study on “Use of sluice gate for fish stock enhancement and diversification at CCP and PIRDP areas” also demonstrated to the visitors.

The stall was located in suitable position in the Fair. It attracted the visitors’ eyes easily and they had easy access to the stall. The stall with 10 feet width and 15 feet length was decorated with a wooden design sluice gate structure. The banners showing the project and sponsor’s information stuck to a suitable place. The multimedia projection was one of the main means of communication that continuously demonstrated benefits of Harvest Reserve and Sluice gate management. The visitor’s registration notebook and visiting card box also placed to obtain visitors’ comments and information.

### **Activities undertaken**

The activities in the stall were planned according to the prior understanding about the visitors’ level, knowledge, education and their due anticipation. The activities conducted at the BCAS-FMSP stall during the Fish Fair are given below:

#### Displays

The printed materials viz. posters, leaflets (enlarged format), etc. were displayed to the visitors. The books, publications and leaflets, etc. were placed on the table to draw the attention of visitors. Different communication tools exhibited to convey the FMSP messages to different stakeholders. The description of displayed materials noted below:

- *Posters*

Two posters with different themes (size: 23”x36”) were printed out that hold the concept, advice and key information of “Sluice Gate Management” and “Harvest Reserves”. Thereafter, both of the posters were displayed for the visitors at the both sidewall of stall. Moreover, other two posters on water (one from ICCO project and another one is *save water*) and one poster of SEMP project viz. *Jalavhumi Barta* were also displayed at the right sidewall of stall. One FMSP poster on co-management (printed in cloth) also displayed at the right sidewall of stall.

- *Leaflets:*

Two leaflets containing the guideline information of FMSP were printed out in enlarged format (size: 31”x41”). The enlarged leaflets were displayed on the both sidewall of the stall that hold the messages, key information etc. The three FMSP leaflets (A5 size) were also displayed on the table for visitors to take. Moreover, the leaflets on SRS of ITDG, Co-Management of DOF-FMSP and Pollution works of MACH-Kalikoir, *Mokosh Beel* also displayed on the table.

- *Printed information materials:*

Two enlarged (size: 31”x41”) printed copy MAP on BCAS’s areas basis and activities displayed at the right sidewall of stall. The enlarged list of BCAS books and publications (size: 18”x24”) and a BCAS flip chart on our environment (*Amader Paribesh*) were also displayed at the front side of middle column of sluice gate structure.

- *Books and publications:*

The BCAS books and publications were displayed on the table for the visitors. The books and publications are of study findings and research outputs on different fisheries management projects/activities, environmental management programs, water resource management related activities, achievements, etc. The comprehensive list of BCAS publications also made available for the visitors.

- *Registration notebook and visiting card box:*

The registration notebook and visiting card box have been placed on the table. The visitors have made their registration at the notebook during visiting the stall. Moreover, they have also put their visiting cards at the box for further information and communication. Very few visitors have made their registration and some of them also provide their visiting cards only rather than registration.

#### Multimedia presentation

The presentation on FMSP guideline at power point software containing the key information of sluice gate management and harvest reserve were shown to the visitors by multimedia projector. Moreover, the findings of “Use of sluice gate for fish stock enhancement and diversification at CCP and PIRDP areas” also shown to the visitors. The projections were kept on the screen at the back wall of stall with write-up of colorful slides and pictures, figures, tables, graphs, etc. to make easy readable and better understanding by the visitors.

#### Materials distribution

The printed materials of FMSP were distributed among the visitors. The distribution were conducted according to the relevancy and interest of visitors to make effective use of materials to follow the same management system at their locations/waterbodies, in other research works, further intensive study, or as education materials, etc. The description of materials distributed among the visitors is listed below:

- The FMSP leaflets (03 types)
- The FMSP poster with key messages on benefit of sluice gate management
- The FMSP poster with key messages on how to establish harvest reserves, why harvest reserves, its management procedure, benefit, etc.
- ITDG-SRS leaflet
- DOF-FMSP co-management leaflet
- MACH-Kaliakoir, *Mokosh beel* pollution findings leaflet
- Comprehensive list of BCAS books and publications
- The SEMP poster with key messages on wetland resource value and management (*Jalavhumi Barta*)
- The BCAS flip chart on our environment (*Amader Paribesh*)

#### Communicating the participants/visitors

During the visiting hours, the BCAS representatives were willing to open discussions with participants/visitors in order to provide them information according their area of interest. BCAS staff members were very careful when they explained the benefits of sluice gate management and harvest reserves. They used simple language to explain multimedia presentation as well as posters and leaflets. Other staff members who were present in the stall during that period tried to follow the process of communication. They gave feed back time to time to make all demonstrations understandable to the visitors. Few visitors requested to get the sluice gate facilities as their area remained inundated by water. On the other hand, some of them showed their interest to contact with BCAS-HQ for further details about FMSP activities.

## Back ground information of the participants/visitors

The participants/visitors had different working background according to their professional engagement, interest and necessity. Most of the visitors (85%) were reluctant to write something on the comment book. Plausibly, 15% among the total visitors recorded their comments on the book. A very few of them put their visiting card in the box. However, a categorization of visitors had been made on the basis of their feed back on the comments book. To this end, the major category of the visitors are: Researchers, Teachers, Students, Government officers, NGO representatives, Media people (both from TV Channel and News Paper), Fish farmers, Lawyers, Fisheries development project representatives, Private farms and General individuals. The visitors were from Dhaka and different districts like Chittagong, Khulna, Noakhali, Comilla, Mymensingh, Rajshahi, Moulvibazar, Kaliakoir, Sherpur, Parbatipur, Daudkhanda and Brammanbaria. The status of registered visitors (as per category) is mentioned in the table 1. Usually the concentration of visitors observed from 11.00 a.m. to 02.30 p.m. and followed by 04.30 p.m. to 08.30 p.m. Therefore, the Professional visitors visited the stall after office hours at the afternoon. The Researchers, Teachers and Students also visited the stall at the morning, afternoon and evening also. The distinguished visitors are: Minister and Secretary of MOFL, Director General, Department of Fisheries, Director General, Bangladesh Fisheries Research Institute, Teachers from DU, BAU, JCU, Nagoya University, Japan,

## Opening hours

The fair authority had decided the duration and daily opening hours considering the visitor's suitability and time access. The stall remained opened from 09.00 a.m. for the visitors and continued up to 09.00 p.m. without any break every day from 09 to 17 August 2005.

**Table 1: Status of registered visitors (as per category) visited BCAS-FMSP stall.**

Visitors category	Numbers
Researchers (fisheries, social science, hydrology and natural resource management sector)	8
Teachers (DU, BAU, JCU and Nagoya University, Japan)	20
Students (school, college and university)	114
Government officers (DOF, BFDC, WASA, PM's office, MOL, MOA, BFRI, UNO, LGED, Youth ministry, Shilpakala academy, Secretariat and Agrani Bank)	34
NGO representatives (UNDP, BRAC, CNRS, Padakshep, WATSAN, HEED, ADI, CCDA, Jubok, Grameen Foundation, Susilon, CRED, PBDF, Solar group, BASC, WARPO and Proshika)	43
Media people (BTV, Channel-I, Channel-S, RTV, NEW AGE, Ittefaq, Samakal, Daily Nayadiganto, Daynik Karotoa and Daily Deshbangla)	12
Fish farmers (shrimp group, white and black fish culture group, hatchery group)	17
Lawyers (supreme court and lower court)	9
Fisheries Project Representatives (FFP, MACH, CBFM, PBAEP, GNAEP, IFAD and ATDP-II)	11
Private farms (Opsonin, Novarties, Beximco, Mid way fisheries and Eon agrovates)	37
Private individuals (shop keeper, wage labor and unemployed persons)	329
Total registered visitors (total including non-registered visitors estimated as over 4,000)	634

## Documentation

The documentation of BCAS-FMSP stall activities in the fish fair were conducted using different media and tools. The main consideration was to document the overall stall activities for the organization, donor and other interested resource persons. To this end, the undertaken documentation activities are described below:

### Photographs

Different moments of activities at stall viz. display of books and publications, displayed posters, leaflets, visitors attending discussions, their observations on books, leaflets, multimedia presentations, etc. have been documented by taking photographs using digital camera. Few key photographs are also used in this report.

### Video

The overall stall activities including fair inauguration program have been documented in a digital video format and made available as CD version.

### Visitors Registration

The BCAS staff members requested the visitors to make their registration for record keeping purpose. The service included: attended in the open discussion, taking FMSP communication materials, observed multimedia presentation, etc. Therefore, the registration notebook was maintained and documented an estimated 15% of the visitors visited the BCAS-FMSP stall.

### Collection of visiting cards

A box was placed on the corner of display table and the visitors dropped their visiting cards during visiting the stall. Therefore, the collection of visiting cards also documented the details of visitors.

### Report on the stall at Fish Fair

This detailed report is being produced and documented the overall details of BCAS-FMSP stall, its activities, achievements, etc. To disseminate the information, this report has been produced for the organization, donors, interested readers and learners.

## **Conclusion**

The process of disseminating information about the benefits of Sluice Gate Management, Harvest Reserves and FMSP guideline including other project activities in fish fair was more or less successful. It was evident that most of the participants were confused to draw the distinction between Sanctuary and Harvest Reserve. BCAS staff members put lot of efforts to make it understandable to different participants and stakeholders. The benefits of Sluice Gate management were well communicated. However, to set up a stall in the fish fair with demonstration strategies of different communication materials was found more or less effective.

## **Annex 2.2 FMSP Sponsored Seminar at Bangladesh DOF Fish Fortnight**

Title: *'Poverty Alleviation through Development and Management of Inland Open Water Fisheries'*.  
Date: 8 August 2005  
Venue: BIAM  
Organisers: BCAS and DOF

### **Introduction**

The Department of Fisheries and Bangladesh Centre for Advanced Studies jointly organized a seminar on 'Poverty Alleviation through Development and Management of Inland Open Water Fisheries' on 8<sup>th</sup> August 2005 at BIAM Auditorium, New Eskaton, Dhaka as a part of observing the National Fish Fortnight 2005. The slogan of the fish fortnight was '*Haor, Baor, Plabonbhum* *Matshyachasher Sonar Khani*' (*Haor, Baor*, Floodplain are the Gold Mines for Fish Culture). Objective of the seminar was to get feedback for the development and management of inland open water fisheries through sharing knowledge and experience of different studies / research and programmes conducted under FMSP as well as government supports. The seminar comprised of two sessions – Inaugural Session and Technical Session (see programme below).

Dr. Khandakar Mosharraf Hossain MP and Honorable Minister, Ministry of Health and Family Planning was present in the seminar as the chief guest. Mr. Abdullah Al Noman MP and Honorable Minister, Ministry of Fisheries and Livestock and Mr. Ukil Abdus Sattar Bhuiyan, Honorable State Minister for Ministry of Land were present in the seminar as special guests. The seminar was Chaired by Mr. Md. Abdul Karim, Secretary, Ministry of Fisheries and Livestock. Mr. Md. Nasir Uddin Ahmed, Director General, Department of Fisheries delivered the welcome address. Dr. Ainun Nishat, Country Representative, IUCN, presented the keynote paper in the inaugural session. Dr. Saleemul Huq, Chairman, Bangladesh Centre for Advanced Studies, delivered the vote of thanks to the participants of the seminar. The seminar was attended by about 200 participants from different government & non-government organizations, universities, research organization, etc. (see participants list below).

### **The Inaugural Session**

The inaugural session was started with the recitation from the Holy Quran. In the welcome address, Mr. Md. Nasir Uddin Ahmed, DG -DOF highlighted that the seminar issues to be raised would help in formulating a noteworthy and effective fisheries policy for development of the fisheries sector. He hoped that the keynote speech, papers to be presented and discussion would yield specific recommendations on how development and management of fisheries in open water bodies could contribute to poverty alleviation in Bangladesh. He also focused on the potentials and problems in development of open water fisheries. He opined that the management of open water fisheries needs research-based scientific knowledge and information that could be brought out through the seminar as recommendations. For the improvement of open water fisheries, there is a need for skilled manpower, social mobilization and local institution building. He further said that micro-credit should be provided to the community and banks can play effective role there through investment in this sector. Government should take effective steps for development and management of open water fisheries through involving the poor and fishers community for enhancement of production and improvement of their livelihoods. He criticized over the existing barriers to leasing out the government water bodies to the real stakeholders. He demanded for an integrated policy where the concerned government bodies would be flexible to make sure the leasing system working for the greater target- poverty alleviation.



In the keynote speech, Dr. Ainun Nishat felt that there is compartmental approach in land, water, fisheries and agriculture that created a lot of problems in resource management in open water system. He mentioned that the current paradigms focus on the production and growth but not on the distribution and equity. So poverty alleviation is not getting much attention even in the PRSP. He said, potentials are there for poverty alleviation but the attentions are paid only for the development. PRSP should include normal development programs and it needs to be clear how the normal development is related to the poverty alleviation. The current approach should focus on the access and entitlement of the poor to the open water and other resources. The policies of fisheries management tend to give emphasis on poor and marginal group but this is not practiced.

Dr. Nishat also tried to find the links of fisheries management with PRSP, MDG, Agenda 21 and the national policy and programs in Bangladesh. The WSSD plan of implementation set the target for poverty reduction, natural resource management, human development and social development. He indicated that poverty alleviation could be inbuilt in the national development programs and it should get priority in ADP or five year plan.

He added that government should formulate sustainable livelihood framework. The existing water policy is causing harm to fisheries. Open water fisheries faced a remarkable loss, though the closed water fisheries are getting the chance to be geared up through aquaculture. Sluice gates were constructed to benefit the rice production, that is why those are not actually fish-friendly, he further added. He pointed out that one fish friendly sluice gate (fish pass) was constructed in Moulavibazar district. But it was not found suitable for the fishes of Bangladesh as the design was borrowed from other country. Research is therefore, needed to develop suitable design of fish pass or fish friendly sluice gate for the fishes of Bangladesh. He criticized over the leasing system of open water bodies to the rich man by depriving the poor and marginal people and fishermen. It is needed to ensure the access of the local community to the open water bodies so that they can be benefited from the natural resources for their sustainable livelihoods. He criticized over the FFP mentioning that the outcomes of the project could not benefit the ultra poor as there is a lack of planning to benefit the poor.

In the speech, Mr. Ukil Abdus Sattar Bhuiyan, Honorable state minister considered the fisheries sector as an important sector amongst all which are contributing to the country's economy. He said, fishery is such a sector where everybody can have the scope to be involved directly or indirectly. He cited the example of Daudkandi Model of community fisheries where every community people are getting the benefit from the community fisheries. He emphasized on the fish culture in the closed water bodies as well as the in the open water bodies. He said, people have to be habituated with the new that might be added with the old. To meet up the need of protein for the people, the fisheries experts should go for research for the new species and people should be made habituated with them. He further said that general thinking of the community people can be shared and utilized in the enhancing programs for development and management of fisheries production in the floodplains. He then emphasized on the distribution of the benefits and marketing of the products to ensure the reduction of poverty.

Mr. Abdullah Al Noman, MP and Honorable Minister for the Ministry of Fisheries and Livestock said in his speech that sustainable development requires the combination of all development processes. He opined that PRSP should integrate land, water, fisheries, and agriculture etc. altogether to attain the sustainable development. He regretted for the unplanned leasing system of the open water bodies which are neither production-oriented nor beneficial for the poor fishers. He said that leasing system should be production oriented and unemployed and poor fishers should get the lease for fisheries management and cultivation so that they can get relieved of poverty. He mentioned that employment generation, poverty alleviation and development are closely associated with the development of fisheries. He emphasized on the conservation of the threatened species. He

added that approximately 70% fish was available in the open water bodies before but today's situation is totally adverse and the open water bodies have been about to fish-free zones in Bangladesh. He further added this is a serious threat to sustainable development. Appropriate research should be conducted to make specific recommendations and indications on how to regain the fisheries in the inland open water bodies as well as the way to protect the threatened indigenous species, he added.

Dr. Khandaker Mosharraf Hossain, MP and Honorable Minister for the Ministry of Health and Family Planning said in his speech as the chief guest that the use of chemical in crop cultivation has been one of the prime causes of decreasing fisheries in open water bodies. The increased crop cultivation has led to the decreasing the fish production in the open water bodies. Fish production could be increased through aquaculture in closed water bodies by converting crop land into pond. But it would result in overall decrease of crop production in the country as the land is very scarce. To attain increased production of both the fish and rice, an alternative way should be sought and it would be the best option to increase production of fishes through aquaculture in the open water bodies along with rice or alternately with rice. He further added, everybody should pay attention for adopting fish cultivation in open water with out affecting the ecology of the canal, *beels*, ponds, river, *floodplain* etc.

He further said that proper management system should be developed to increase the fisheries production in the open water bodies. He cited an example of Daudkandi Model of community fisheries development and management in floodplain. He opined that the success of this model can challenge the micro-credit system or the World Bank since this model is based on the community based organizations where all people in the community are getting the benefits of the model. He termed it a silent revolution. He claimed that the overall ecosystem and geographical condition of the locality remain unchanged there to protect the natural biodiversity of the local ecosystem. This model proved that high yield of crop and fishes is simultaneously possible. He then emphasized on the dissemination of the messages of the model so that the whole country can be benefited following the model.

The chairperson of the session, Mr. Md. Abdul Karim, Secretary of the Ministry of Fisheries and Livestock said at his speech that only the growth is not sufficient for the overall development of a country rather equity should be ensured at all levels. He opined that land use policy should have fruitful changes to attain the fisheries sector sustainable. He expressed his hope that the seminar would yield some directives & suggestions that would be helpful to attain the sector sustainable.

Dr. Saleemul Huq, Chairman of BCAS gave vote of thanks to the audiences and the participants for their valued contribution to the seminar through raising the issues related to the fisheries development and management and providing suggestions for the development of fisheries in the open waters to meet up the needs of protein of the community people.

### **Technical Session**

Mr. A K Ataur Rahman, former DG of DoF chaired the technical session. Four papers were presented in the session. Md. Liaquat Ali, Fellow at BCAS and Mr. Sarder Shafiqul Alam, Research Fellow at BCAS presented the paper on Management for Regulator/sluice gate for fish stock enhancement in modified floodplain. Mr. Mokhlesur Rahman of CNRS presented the paper on Crop diversification in floodplains to increase agriculture and fisheries production. Md. Zahirul Islam and Mr. Kafil Uddin Kaiya of DoF presented the paper on Establishment of sanctuaries and fish fingerling stocking to increase fish production. Mr. Raqib-al-Arif of ITDG presented the paper on Development of self-recruiting fishes for protein supply to the poor.

At the open discussion of the session, Mr. SM Shah Alam, Director of BRDB expressed his

concerns over the embankment that would be built in 2015 by the Indian Government to interlink 15 rivers. He emphasized on the future consequences of it on the environment and water management.

Professor Abdul Quddus of Dhaka University demanded for establishment of Hilsha Fish Research Institute and a separate directorate of marine fisheries. He expressed his concern that the local fishes are being depleted day by day. Research is needed to find out the way to save those fishes.

Dr. Khabir Uddin Ahmad of BARC said, people have also to think over saving the fishes when they are outside of the declared sanctuaries. He opined that sanctuaries might be species-specific rather than area-based. The indigenous small fishes should be cultivated through the natural ways but not with the carp fishes altogether.

Mr. Sarder Shafiqul Alam of BCAS said, it is needed to conduct a research whether the Daudkandi model is friendly for the biodiversity conservation or not. Sluice gates should be well managed so that all fishes can easily get through the sluice gate into the project areas during flood or rainy season.

Mr. Abdul Jalil of DoF said that fishermen community should be empowered within the sluice gate management committee so that they can stand for the demand of water intrusion at the proper time for fishers with the rich man in the community who demand for the water for paddy cultivation. He added that sanctuaries can be established in the deep wetlands in the modified floodplains.

He further said that broadcast *Aman* paddy could be the proper crop in the floodplains as those can survive in deep water. Again those may be the shelter of the fishes. He mentioned that sanctuaries are established under different projects. After completion of projects, those are not taken care of. Government should establish sanctuaries at every Upazilla with proper management and fish friendly operation of existing sluice gates and construction of fish friendly sluice gate in future be ensured.

Mr. Fani Bhusan Malo, President of Fishermen Association said that proper policy guidelines should be introduced for the management of open water bodies so that the real fishermen community can get their rights to the wetlands established.

Chairman of the session Mr. A K Ataur Rahman, former DG of DoF finally summarized the papers presented and the discussion over the papers. He extended his thanks to everybody present in the session for their active participation and contribution towards proper management of inland open water fisheries in Bangladesh. He hoped that the outcome of the seminar would be useful for drawing policy guideline of inland fisheries management.

## **Recommendations**

The followings are the recommendations extracted from the seminar:

1. Inter-sector integrated programs should be taken by involving the targeted people and the concerned organizations in the process of water management to attain the sustainable development.
2. To ensure migration of fishes into the modified floodplains for facilitating their breeding and feeding, appropriate fish pass or fish friendly sluice gate should be constructed. Information on normal movement of fishes, their food habit and movement/speed during breeding period are very important for proper designing the fish pass. If such information are not available, research should be undertaken for gathering those information which would help to properly design the fish friendly regulator.
3. Sluice gates should be kept open during the early monsoon (May-July) so that the migration of the fishes (matured and juveniles) to the modified floodplain can be ensured.

4. Fishing in the canal/rivers connecting the main rivers with sluice gates should be controlled or totally banned during early monsoon.
5. The enhancement of the livelihoods of the ultra poor and sustainable development can be achieved through making sure of the access of the ultra poor to the common property resources like open water bodies, *khal*, *beel*, *haor*, *baor*, river etc. and also to the credit.
6. To ensure 'more crops and more fishes' production, Daudkandi model of community fisheries can be adopted for fish cultivation and fisheries management in floodplains all over the country. Community based management can easily ensure the participation of all categories of people in the development process as well as the proper use of resources and equitable distribution of benefits. This type of management can also create the scope of employment and income generation for the poor and landless people. There is a wide scope for involvement of people of all classes (rich, poor, literate and illiterate) in aquaculture and fisheries management in the floodplains.
7. Research should be undertaken to identify and to protect the threatened or and nearly depleted species.
8. Sustainable development should be ensured through integrating the components of land, wetland and fisheries.
9. Management of the wetlands should be undertaken as per the development plan made through participation of the professional fishermen and local poor community to ensure the promotion of the livelihoods of the poor people, sustainable fisheries development and biodiversity conservation.
10. Land use policy should be updated to ensure the sustainable development in agriculture and natural resources i.e., crops, fisheries, livestock, forests etc.
11. Research should be conducted to assess the potential impacts of climate change on the fisheries sector in Bangladesh.
12. It should be encouraged to cultivate the crops like wheat, onion, pulse, potato etc. that require less water than the other crops like *boro* paddy in the low wetlands so that water in the *beels* and other wetlands can be preserved for fish production even in the dry season. If it is not possible to grow those crops there, then such variety of rice could be introduced as could be harvested before 1<sup>st</sup> flooding so that the rice is not affected in the event of opening the sluice gates to ensure fish migration.
13. To ensure proper management of fisheries, institutional structure has to be strengthened as well as the manpower management has to be improved.
14. Sanctuaries should be established up in the modified floodplains. Arrangement of alternative livelihood opportunities should be made for the beneficiaries living adjacent to the wetlands if the beneficiaries are affected due to sanctuary.
15. Micro credit activities should be strengthened and simplified to encourage the small farmers to cultivate fishes. Banks and other money laundering institutions should be widely got involved in this process.
16. Insurance system should be introduced to cover the risks in fish cultivation.

### **Seminar programme**

The seminar programme is given below. The programme included a presentation by BCAS's Md. Liaquat Ali and Sarder Shafiquil Alam on '*Management of Sluice Gate/Regulators for Fish Stock Enhancement in Modified Floodplain Without Harm to Rice*'. See separate document submitted with report.

Title: Seminar on Poverty Alleviation through Development and Management of Inland Open Water Fisheries

Venue: Multi Purposes Hall, Bangladesh Institute of Administration and Management (BIAM), 63 New Eskaton, Dhaka.

Date: 08 August 2005

Organized by: Bangladesh Centre for Advanced Studies and Department of Fisheries

**Opening Ceremony:**

09:30: Registration of Participants

10:00: Guests take their seats

10:05: Recitation from the Holy Quran

10:10: Welcome Address - Mr. Md. Nashir Uddin Ahmed, Director General (in-charge), Department of Fisheries (DOF)

10:15: Keynote paper presentation - Dr. Ainun Nishat, Country Representative, IUCN

10:35: Address by special guests

- Ukil Abdus Sattar Bhuiyan, Honorable State Minister, Ministry of Land

- Mr. Abdullah Al Noman, MP and Honorable Minister, Ministry of Fisheries and Livestock

10:55: Address by chief guest - Dr. Khandaker Mosharraf Hossain, MP and Honorable Minister, Ministry of Health and Family Planning

11:20: Address by chair - Mr. Md. Abdul Karim, Sectary, Ministry of Fisheries and Livestock

11:25: Vote of thanks - Dr. Saleemul Huq, Chairman, BCAS

11:30: Tea break

**Technical Session**

Chairperson: Mr. A K Ataur Rahman, Former Director General, DOF, Bangladesh

Reporters: 1) Mr. ABM Zahid Habib, Assistant Director, DOF

2) Mr. Md. Fazlur Rahman, Assistant Director, DOF

3) Mr. A S M Juel, BCAS, Dhaka

11:50: Management of Sluice Gates/Regulator for Enhancement of Fish Productions in Modified Floodplains without Harm to Rice Production – Md. Liaquat Ali and Sarder Shafiqul Alam, BCAS

12:10: Crop diversification in floodplains to increase agriculture and fisheries production - Mr. Mokhlesur Rahman, CNRS

12:25: Establishment of sanctuaries and fish fingerling stocking to increase fish production - Md. Zahirul Islam and Mr. Kafil Uddin Kaiya of DoF

12:45: Development of self-recruiting fishes for protein supply to the poor - Mr. Raqib-al-Arif, ITDG, Bangladesh

13:00: Open discussion - Participants

13:50: Remarks by the Chair - Mr. A K Ataur Rahman

14:00: Lunch - BIAM Cafeteria and close

**List of Guests/Participants**

Sl. #	Name & Designation	Organization	Telephone E-mail / Fax
1	Dr. Khandakar Mosharraf Hossain, MP and Hon'ble Minister	Ministry of Health & Family Planning	
2	Mr. Abdullah Al Noman, M.P. & Hon'ble Minister	Ministry of Fisheries & Livestock	
3	Mr. Ukil Abdus Satter Bhuiyan, Hon'ble State Minister	Ministry of Land.	
4	Mr. Md. Abdul Karim, Secretary	Ministry of Fisheries & Livestock	
5	Mr. Md. Nasiruddin Ahmed, Director General	Dept. of Fisheries	
6	Dr. Ainun Nishat, Country Representative	IUCN	
7	Dr. Saleemul Huq, Chairman	BCAS	
8	Ms. Rokea Sultana,	MOFL	

Sl. #	Name & Designation	Organization	Telephone E-mail / Fax
	Jt. Secretary		
9	Md. Bahram Uddin Deputy Chief	Department of Fisheries Matshya Bhaban, Dhaka	0172-028950
10	Mr. M. A. Ali	- Do -	
11	Md. Billal Hossain Researcher	BCAS	
12	A.S.M. Juel Research Officer	BCAS	
13	S.M. Shah Alam	Rural Development Bangladesh	8313505 (Fax)
14	Amulya K Debnath Director	IMED, M/O, Planning	
15	Mamtaj Begum District Fisheries Officer	DOF	
16	Manjur Kadir, A.D.	DOF	
17	Ramesh Mondal, AD	DOF	
18	M. Shahajat Ali, D.D.	FFP, DOF	
19	Md. Rafiqul Islam Talukdar, DFO	DOF	
20	Mokammal Hossain P.S.O.	Department of Fisheries	
21	Bimol Krishna Roy	Department of Fisheries	
22	Md. Syed Hossain, A.D.	Department of Fisheries	
23	Syeda Shirin K. Khatun	Department of Fisheries	
24	Md. Shyner Alam, OSD	DOF	
25	Md. Shariful Islam Akhanda PCD, FFP	DOF	
26	Md. Fazlur Rahman, AD	DOF	
27	Kazi Helana Arzu Inspector (Q.C.)	DOF	
28	Md. Tofaz Uddin Ahmed, AD	DOF	
29	Md. Belal Hossain Research Officer	DOF	
30	Md. Rezaul Karim Assistant Director	DOF	
31	Md. Aminul Islam Chief Fisheries Ext. Officer	Department Of Fisheries	aminul@fisheries.gov.bd
32	Abul Hasem Sumon Assistant Director	Department of Fisheries	
33	Sardar Shafiqul Alam. Research Fellow	BCAS	
34	Prof. Md. Aminul Islam	Bangladesh Agri University, Mymensingh	<a href="mailto:amir_1944@yahoo.com">amir_1944@yahoo.com</a> , 02-8313738 011074401
35	Dr. Abdul Mazid, D.G.	BFRI	
36	Md. Mohiuddin, Dy. Director	DOF	
37	Dr. M.A. Rashid	Dept of Livestock	
38	Md. Amir Hossain, DPD, FFP	DOF	
39	Nasera Chowdhury, Research Officer	DOF	



Sl. #	Name & Designation	Organization	Telephone E-mail / Fax
40	A.K.M. Lutfur R. Siddique	DOF	
41	Dr. Mahbub Alam, Communication Specialist	BCAS	
42	A.K.M. Enamul Haque Mia, Director	DAE	
43	ARNE ANDE ASSON Team Leader	FFP, DOF	
44	Niaz Ahmed Apu	FFP	
45	Masod Ara Moni	UFO, DOF	
46	Waresha Chowdhury, FEO	DOF	
47	Rama Rani Das, Cartographer	DOF	
48	A.B.M. Shabbir, Technologist	DOF	
49	Uamal Ahmed	Bangladesh Betar	
50	A Shafi, Secretary		
51	Md. A. K. Azad, PhD Fellow	D.U.	
52	Ali Hossain	.....	
53	Md. Ayub	Ministry of Fisheries & Livestock	7167306
54	Mihir Prama	Department of Fisheries	
55	Enayat Hossain	Department of Fisheries	
56	Rabeya Khatun	DOF	
57	Md. Mohib Ullah	PLCE – 1	
58	Syed Iftekhar	CARE	
59	Khurul Alam	BSS	
60	K.S. Miah	Reporter	
61	Md. Jaman	Reporter	
62	M. Arif	Daily Purban Chal	
63	Md. Showkot Ali, D.D.	DOF	9553088 (O)
64	Nazrul Islam, Director	Department of Fisheries	
65	Imtiaz Ahmed Deputy Director	Department of Fisheries	
66	Kafiluddin Kaya, A.D.	Department of Fisheries	0152-314271
67	Abdur Rashid Dhali	FFP, DOE	
68	A.K.M. Mokleshur Rahman	DOF	
69	Khelada K. Chowdhury	DOF	
70	Sharif Toybur Rahman Chairman	BFDC	7162001
71	Afshan Noor	DOF	
72	Monowara Begum	DOF	
73	Md. Abul Khayer	DOF	<a href="mailto:khair2222@yahoo.com">khair2222@yahoo.com</a> , 9560472
74	Bishwajit Kumar Deb	DOF	
75	Yesmin Ara Ahmed	Department of Fisheries	0175 122318
76	Begum Anwari, P.D.	Department of Fisheries	
77	Md. Maksudul Huq Bhuiya	Department of Fisheries	
78	Md. Johirul Islam, Consultant	FFP, DOF	
79	Md. Alimuzzaman Chy., XEN	FFP, DOF	
80	Md. Raquib-el-Arif	ITDG-B	
81	A.K. Ataur Rahman, Ex D.G.	Department of Fisheries	

Sl. #	Name & Designation	Organization	Telephone E-mail / Fax
82	Md. Shahjahan	Dept. of Fisheries, FFP	
83	S.M. Alauddin	BCAS	
84	Aliur Reza	DOF	
85	Md. Nurul Akter	DOF	
86	Kh. Akhteruzzaman	DOF	8356164
87	Md. Mahbubul Alam	DOF	9555351
88	Dr. Khabir Ahmed, PSO.	BARC	8111463
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90	Shahin Akhter, R.O.	DOF	9571698
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94	M.A. Barek	DOF	
95	Md. Ahsan Hasib Khan	DOF	
96	Mohammad Ali Miah, A.D.	DOF	
97	Md. Monjur Hossain	Gazi Fisheries Ltd.	
98	Md. Zillur Rahman	Munsiganj Fish Farm	
99	Sukamal Chandra Sutradhar	DOF, Dhaka	
100	Joarder Shibendra Nath	DOF, Dhaka	
101	Md. Abdur Rahman	Department of Fisheries	
102	G.M. Shamsul Kabir, A.D.	DOF, Dhaka	
103	Nazrul Islam	DOF, Dhaka	
104	Md. Motaher Hossain	DOF, Dhaka	
105	Masum Ahmed	Bangladesh Betar	
106	Md. Shamsul Huq	DOF	
107	Khandaker Atiar Rahman, Deputy Secretary	MOFL	
108	Md. Jalil	Manikganj	
109	Md. Mosharaf Hossain Akand	Department of Fisheries	
110	Dr. Giasuddin Khan, DFO	DOF	
111	Md. Rabiul Islam	BIAM	
112	Golam Rahman	Daily Bhorer Awaz	
113	A.S.M. Kalam	.....	
114	Rahman	Dainik Pubali	
115	M.S. Islam	DOF	
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118	Md. Jamshed Ali	BCAS	
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178	Md. Sanaullah, Director	DOF	
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180	Abu M Kamaluddin	PDO – ICZMP	
181	Md. Abdul Jalil Program Co-ordinator	DOF	
182	Md. Mizanur Rahman	DOF	
183	Md. Salim Bhuiya	DOF	
184	Md. Salim Ullah	DOF	
185	Md. Aminul Islam	DOF	
186	MD. Toyab Ali	DOF	
187	Md. Mobarak Hossain	DOF	
188	Momin Hossain	ERDA	

## Annex 2.3 Pot song performances

Pot songs are a traditional Bangla culture, performed in local languages by a travelling theatre group. Pot songs were used by the project to educate people about floodplain management activities, and specifically on the key messages on the use of sluice gates and harvest reserves. The pot song was performed in ten locations to accompany the theatre drama productions (see below).

### Bangla version of pot song text:

F MSP (R8486), Pot songs, BCAS, Bangladesh

#### পট গান

রচনা : শিশির রহমান  
(নাট্যকার, নির্দেশক, অভিনেতা)

নির্দেশনা : মনির হোসেন চৌধুরী

পরিবেশনায়ঃ ইআরডিএ সাংস্কৃতিক দল

আয়োজনেঃ বিসিএএস

#### পট নং-১

পূর্বে বাংলার মানুষ সুখে শান্তিতে ছিল। গোলা ভরা ধান, নদী ভরা মাছ। কৃষকের মাথায় ফসল। সুন্দর প্রকৃতি এবং বর্তমান অবস্থা। মাছ ও জলজ সম্পদ কমে যাওয়ার দৃশ্য।

#### গান নং-১

তোমারে রেখেছি মুরশিদ আমার অন্তরে  
দয়া কর দয়াল মুরশিদ দয়া কর আমারে ।।

সভাপরে আছেন যত সূখী সভাজন  
সবাইই চরনে জানাই হাজার সালাম  
আছেন যত গুণীর্ণ আজ এই আসরে  
মন দিয়া গুনবেন কথা বলছি বিনয় করে (।।) ঐ

বাংলাদেশের মানুষ মোরা বাংলাদেশেরই ঘর  
মিলেমিশে আছি হেথা নাহি কেহ পর  
মাছে ভাতে বাঙ্গালী আমরা কার না আছে জানা  
সেই মাছ নিয়া গাইব আমরা পট গীতির ঘটনা।

একদা এই বাংলাদেশের ছিলনাকো অভাব  
জনসংখ্যা বাড়ছে তাইতো পড়ে তাহার প্রভাব  
জনসংখ্যার সাথে সাথে বাড়ে নাই তো জমি  
মাছের জন্য সেই রকম আর নাইকো জলাভূমিরে (।।) ঐ

#### পট নং-২

বর্তমান অবস্থা। মাছ ও জলজ সম্পদ কমে যাওয়ার দৃশ্য। স্লুইস গেটের দৃশ্য এবং সুফল ও সমস্যা বোঝানো। জমি জেগে উঠছে, ফসল ফলছে কিন্তু মাছের সংখ্যা কমে যাচ্ছে, দরীদ্র জেলেরা মাছ ধরার সুযোগ পাচ্ছে না এবং ওদের জীবনে হাহাকার।

#### গান নং-২

স্লুইস গেটের ভিতরে প্রথম জোয়ারে  
পানি আসে জমিতে আবার ও বন্দুরে  
পানি আসে জমিতে আবার।  
নদীর মাচ ঢুইকা পড়ে বিলে জিলে খালেতে  
খালে বিলের মাছেরা যায় ডিম পাড়িতে নদীতে  
কথাটা সবাই জানাই ও দেশ বাসী ভাই (।।)

জোয়ারের বেলায় নদীর পানির উছলায় (২)  
এইটাতো হুকুম আলার ও বন্দুরে (।।) ঐ

প্রথম জোয়ারে গেটের সঠিক ব্যবহারে  
উৎপাদন বৃদ্ধি করা যায়  
ফলবে ফসল মাছ আসিবে  
কৃষক ভাইদের প্রাণ হাসিবে  
বিনয় করে বলি সবায় ও দেশবাসী ভাই  
বিকল্প চাষ দেবে সমাধান ও দেশ বাসী ভাই।



কর্মকর্তা আছেন যারা। কৃষক ভাইদের বলবেন তারা (২)  
মাছ ফসলের হবেনা অন্তরায় ও বন্দুকে।।

পট নং-৩

সুইস গোট কমিটির আলোচনার দৃশ্য। কিভাবে মাছ বাড়ানো যায় সে বিষয় সিদ্ধান্ত। নির্দিষ্ট মাপে গোট খোলা।

গান-৩

শোনেন শোনেন দেমবাসী শোনেন দিয়া মন  
জোয়ারের সময় সুইস গোটের করেন সঠিক যতন (।।) ওরে

সবার সাথে আমি বলি একই কথা মানি  
সুইস গোটের সঠিক ব্যবহার করতে হবে জানি  
বহিষ্কৃত শ্রোত বানাইয় সঠিকভাবে খুলিয়া  
ছোট বড় মাছের লাগি হবে উপকার ও (।।) রে

বড় বড় মাছ আছে সংখ্যায় যারা কম  
গোটের ব্যবহারে তাদের করা যায় সমাগম (।।) রে

মনে রাখা খুবই দরকার/শ্রোত যেন হয় সঁাতার  
মাছ আসিতে ঝাঁকে ঝাঁকে হবে উপকার

পট-৪

সুইস গোটের ভিতরে সঞ্চয়গারের জন্য ভালপালা দিয়ে অভয়াশ্রমের দৃশ্য। সুইস গোটের বাইরে সংযোগকারী শাখা নদীতে  
সাময়িক ভাবে মাছ ধরা বন্দ।

গান-৪

সঞ্চয়গার গড়তে হবে বিলের মধ্যে ভাই  
সঞ্চয়গার গড়ুন সবাই মিলেমিশে ভাইওরে  
নিয়ম ও কানুন মানিয়া  
সঞ্চয়গার গড়িয়া  
সময় মতো ধরতে হবে সেই মাছ বলে যাই ও রে  
শুকনো মওসুমে মাছ ধরা যাবেনা।  
ডিমওয়লা মাছ ভাইওরে ধরা যাবেনা।  
নিয়ম ভেঙ্গে মাছ ভাই ওরে ধরাতো যাবে না (।।)

পট-৫

গান-৫

এইটা হইল শুকনা মওসুম বিলে পানি থাকে না  
তুমি কি জান না তুমি কি বুঝ না  
তুমি কি জান না তুমি কি বুঝ না

শুকনা মওসুম আসিলে নদী নালা খারে বিলে  
কমে আসে পানি ভাইরে এইটা পুরান ঘটনা  
তুমি কি জান না তুমি কি বুঝ না

সুইস গোটের কর্তা যারা এই সময়ে সবাই তারা  
মাছ উৎপাদন রাখতে সঠিক/করবেন পরিকল্পনা।।  
তুমি কি জান না তুমি কি বুঝ না

সেই কারণে করতে সভা/একই সাথে বসছে তারা  
কি করলে হবে উপকার মাছের ক্ষতি হবেনা।।  
তুমি কি জান না তুমি কি বুঝ না

পট-৬

মাছের সংখ্যা বেড়ে যাওয়ার দৃশ্য এবং শুষ্ক মৌসুমে বিকল্প ফসল ফলছে। সুখী সমৃদ্ধ বাংলাদেশ।

২

আমার দেশের মত এমন দেশ কি কোথাও আছে  
 আছে শাপলা শালুক বিলে বিলে  
 নদী ভরা মাছ। বিলে ভরা মাছে।।  
 গেটের ব্যবহারে হইছে ভাইরে উন্ময়ন  
 জেলে চাষীর দুঃখ গেল ভরল সবার মন

ইআরডিএ এর পক্ষ থেকে জানাই আহবান  
 বিসিএএস এর পক্ষ থেকে করি আহবান  
 সবায় মিলে করবেন গেটের সঠিক ব্যবহার

ফসল ফলায় আমার চাষী। রাখাল বাজায় সুখের বাশী।  
 মাছ মারে ঐ নবীন জেলে। কৃষাণ বধুর মুখে হাসি  
 ভুলত্রুটি করবেন ক্ষমা বলছি বিনয় করে  
 গেটের ব্যবহারের পটগিতি জানাইলাম এই আসরে  
 এই পর্যন্ত ইতি করলাম হইয়া নতশীর  
 দয়াল মুরশিদ তোমার নামেরে (।।)

### English version of pot song text:

#### First artwork:

The Singer along with his co-singer describes the artwork. The artwork shows the scenario of the past, as the water bodies were full of fish and other habitat. The people were happy because there was no scarcity of fish and rice. Song 1 covers the first artwork.

#### Second artwork

The second artwork shows the current status of the natural resources. It also exhibits declining trends of fish resources. It shows the construction of sluice gate, which gave rise of land. But it impacted on the fish resources. The singer requested people to keep the sluice gate open during the first flood. He also asked them to search for alternative cash crop instead of rice. The singers describe these features on the artwork.

#### Third artwork

The artwork shows people are discussing in a meeting place. The singer describes how to maintain the ebb flow and to make the movement of fish smoother. He also tells the audience how to keep the large fish in the sluice gate area. Importance of maintaining the water flow is described as it also creates suitable condition for the fish swimming.

#### Fourth artwork

It shows the appearance of a harvest reserve in the deeper part of the water body. It also shows the restriction of fishing on the linkage canal. The singer describes the benefits of the harvest reserve. He asks people not to fish on the linking canal. Fishing during the dry season was also prohibited.

#### Fifth artwork

Shows the increase in fish resources. It shows the field growing with alternative crops. The singer describes the involvement of the community in the harvest reserve management may help in increase fish production. He mentions if people follow the rules properly the whole scenario will be changed like this.

#### Sixth artwork

In the last song the singer thanked the audience for their active participation. He also thanked people on behalf of BCAS, ERDA.

## Annex 2.4 Theatre performances

A traditional drama incorporating the key messages on use of sluice gate and harvest reserves was developed and staged on 11 August 2005 at the National Fish Fortnight in Dhaka. A video-recording was taken of the performance. Further presentations were made of the drama at nine locations in four districts: Pabna, Tangail, Magura and Gopalganj, between 17 and 27 September 2005.

### Bangla version of drama script:

FMSP (R8486), Street Drama-BCAS, Bangladesh

একটি পথ নাটক

“সুইস গেট এর ব্যবহার”

মূল ভাবনাঃ মাহবুব আলম পিয়াল

বিন্যাস ও নাটকঃ  
শিশির রহমান

নির্দেশনা : শামসুদ্দিন খান হিরু

পরিবেশনায় : ইআরডিএ লোক সাংস্কৃতিক দল।

আয়োজনে: বাংলাদেশ সেন্টার ফর এডভান্সড স্টাডিজ

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#### চরিত্র

- (১) ফেদু
- (২) সুত্রধর
- (৩) চিকন আলী
- (৪) নিমাই
- (৫) মায়া
- (৬) মানু
- (৭) নীলকমল
- (৮) মাষ্টার
- (৯) আপা

“এছাড়াও কোরিও গ্রাফি ও গানের দল”

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একটি পথ নাটক

“সুইস গেট এর ব্যবহার”

দৃশ্য : ১

একটি কোরাসদল, বাজনার তালে তালে মঞ্চে ঢোকে। তাদের সবার পোশাক এক রংয়ের শুধু দৃশ্যের প্রয়োজনে পোশাক পরিবর্তন করে নেবে। একটা কোরিও গ্রাফি হবে সেখানে একটা বিল বা হাওড়ের মত মনে হবে। যারা নৃত্য করছিল তাদের সবাইকে দেখা যাবে মাছের ভূমিকায় মাছের মুখোশ পড়ে নাচবে বা পাপেটও করা যেতে পারে। কোরিও গ্রাফির সাথে একটি বন্দনা গান

সূত্রধর : (সূত্র- কল ছিল ছল নদী করে টলমল)

কল কল ছিল ছল নদী করে টলমল  
খালে বিলে পানি আইসআছে  
আহা কি দারুন ফুর্তি লাগত আছে।  
ওরে জৈঠনা আষারে  
বন্যার কি জোয়ারে  
হাওরবাওর বিলে পানি আসে  
নদী নালার বাংলাদেশে  
বিল বাওরযে কত আছে (২)  
সেই কথা যে বলতে হবে সবার কাছে (২)  
ওরে এইতো কিছু দিন আগে  
ভরা নদীর ডাকে  
ঝাঁকে ঝাঁকে মাছের ছিল আনা গোনা

মরছে নদী বাড়ছে সুইস গेट  
তবু ও কি হবে রে হুশ  
সেই হারে মাছ কি আর বাড়তছে (২)

[কোরিও গ্রাফির দলটি বসে পড়ে। বাজনা চলতে থাকে। গানটি গুন গুন করে গাইতে থাকে]

সুপ্রধর : আহা কি দারুন ফুর্তি লাগতছে [ আসে ফেদু মিয়া ও চিকু সদর ]  
ফেদু : ঐ মিয়া, ঐ -- ঐ মিয়া  
সুপ্রধর : ভাইজান কি আমারে ডাকতেছেন নাকি  
চিকু : [ তোতলামির অভ্যাস আছে ] তো তো তো মার সাহস ক------ম না।  
ফেদু : এই তুই চুপ কর।  
চিকু : জি  
ফেদু : হ্যাঁ তা যা কইতেছিলাম। আইচ্ছা আমি কি কইতেছিলাম চিকু মিয়া  
চিকু : উম্ -- আপনে ক-ক-ক-ক-ক  
ফেদু : মনে পড়ছে  
চিকু : হে; হে; হে; হে: জানতাম ম ম --- নে পড়বো  
ফেদু : দূরে দাড়াইয়া তোমার লাফ ঝাপ দেখতে ছিলাম। তুমি গলা ছাইড়া চিৎকার করতেছ। বিষয়টা কি? বলতেছো মনে ফুর্তি লাগতছে আর তোমার বাড়ী কই?  
সুপ্রধর : আমার নাম স্মরন চকিদার। এই নাটকের সুপ্রধর-একটার পর একটা ঘটনা বর্ণনা করি  
ফেদু : ঘ--- ঘটনা?  
চিকু : ঐ ঐ মিয়া তুমি কি কি কি কি  
ফেদু : তুই চুপ কর  
চিকু : এ এ এই ব্যাটার নামডা জানি কেমন স্ স্ সন্দেহ জনক  
ফেদু : সত্য কইরা কওতো মিয়া তুমি কে?  
সুপ্রধর : আমার স্মরন চকিদার। আমি অতীত বর্তমান ভবিষ্যত।  
ফেদু+চিকু : [ভয়ে] কি---?  
সুপ্রধর : ভয় পাইলেন নাকি ভাই সাবেরা। ভয় পাইয়েন না। আপনোতো এই গেরামের মানুষ তাইনা।  
ফেদু : আমি গেরামের কর্তা  
চিকু : আমি কর্তার ম্যা ম্যা ম্যানেজার  
ফেদু : এইবার ঘটনাটা বলা যায়।

গানা-২

সুপ্রধর : ও মরি হায়রে হায় দুঃখে পরান জুলে  
হাজার টাকার বাগান খাইল পাটশিকার ছাগলে  
মরি হায়র হায় (২)  
সুপ্রধর : আরে আছেন যত জ্ঞানি গুনি শোনেন দিয়া মন  
সবারই চরনে আমার আছে নিবেদন।  
ফুলে ফলে মাছে ভাতে ছিল বাংলাদেশে  
দিনে দিনে সেই বাংলা হইতেছে নিঃশেষ  
মরি হায়র হায় (২)  
জোতদার মাদবর মেঘার প্রধান আছেন চেয়ারম্যান  
আমার কথা একবার সবাই খেয়াল কইরা দেখেন  
কোটি কোটি মানুষ মোরা এই না দেশের পরে  
হিসাবমত চলতে হবে প্রতি ঘরে ঘরে(২)।  
মরি হায়র হায় [সুপ্রধর চলে যায়]  
ফেদু : চিকু মিয়া। স্মরন চকিদার কথাগুলো কেমন জানি আউলা আউলা লাগলনা?  
চিকু : শা-শা-শা-শালা  
ফেদু : আকেবার মুখ খরাপ করছস কি দিমু একটা  
[ এমন সময় কয়েকজন জেলে বা কৃষক ফেদু ও চিকুর সামনে দিয়ে হেটে যায় ] [তারা ওদের দিকে ফিরেও তাকায় না]  
চিকু : চা চা চা চা চা।  
ফেদু : তোতলার পো তোতলা কি হইছে?  
চিকু : ইয়ে ক্যাসা জামানা আ গিয়া  
ফেদু : বাংলায় পারোনা হিন্দিতে ঘেউ ঘেউ করো মিয়া। দুই দিন ধইরা হিন্দি ফিলিম দেইখ্যা জবান বদলাইয়া গেছে মিয়া?  
চিকু : সবই পাল্টাইয়া যাইতাছে আর আমি পালটাইলে দোষ কি চা- চা। এই যে দেহেন আগে আপনের কত মানুষ আদাব সালাম দিত। অহন কি আর দেয়  
ফেদু : আদাব সালাম খেতার গাট্রির মধ্যে গোল কইরা ধো ব্যাডা। কে কারে সালাম দিল কি না দিল তাতে আমার কি? তাতে কি আমার গায়ে কি ফোসকা পড়ছে?  
আমি ওগো সালামের ইয়ে করি।  
চিকু : হ ঠিকই কইছেন। মইষের আবার চামড়া?  
ফেদু : কি। কি কইলি ব্যাটা

চিকু : না কইলাম ভাতি আপনার কি আসে যায়? মানির মান আশ্রায় রাখে ।  
 ফেদু : আমার মান সম্মান নিয়া তোমাদের ভাবতে হবেনা । সারাদিন ধইরাতো ফিলিম দেখতাছ আর বইস্যা বইস্যা খাইয়া ঘাড়টা বানাইতেছ কাতলা মাছের মত মোটা ।  
 (গান সূত্রধর গাইতে গাইতে বেরিয়ে যায়)  
 গান  
 একটা কাতলা মাছে খাচ্ছে তামাক  
 আম গাছে ঠেং তুলে  
 কত রং দেখবি মহিমভুলে .....  
 চিকু : এ্যাঁ কি কইলেন? কি কইলেন চাচা । হায় হায় হায় হায়রে --- হায় হায়রে (কাদতে শুরু করে)  
 ফেদু : হায় হায় হায়রে এই এই এই দামড়া, দামড়ার মতো কাদস ক্যান?  
 চিকু : আহা হা হারে মাছের কতা মনে করাইয়া দিলেন চাচা আহ হা হারে কত মাছইনা আছিল আমাগো দেশে । আহা হা কত জাতের মাছ কত পদেরমাছ আহা হা ---  
 ফেদু : সেই দিন আর নাইগো নাতি  
 খাবলা খাবলা ছাতু খাতি  
 [ আসে সূত্রধর/মাদবর বেরিয়ে যায় ]  
 গান (৩)  
 সুর [ আমার কাংখের কলসি]  
 সূত্রধরঃ শোনে দেশ বাসি ভাই  
 আমি সাবরে জানাই  
 অনেক জাতের মাছ এখন আর  
 বাংলাদেশে নাই (২)  
 নদী নালা খাল বিল আর  
 হাওরে পুকুরে---  
 করত খেলা মাছের দলে হাজারে হাজারে (২)  
 এখন গেট বানাইয়া নদী নালায়  
 ধান পান চাষ করিলা  
 মাছের আবাস করার জায়গা নাইওরে (২)  
 পানি ধরতে বাঁধ বাঁধাছ  
 ধান চাষ করিবার তরে  
 বুঝলানা বুঝলানা মানুষ  
 তাতে কি ক্ষতি হইতে পারে  
 দিয়া নদী বাঁধ । করছ কত ফসল আবাদ  
 ধবংশ করছ কত প্রানীর জীবনরে (২)  
 [গায়ন চলে যায়]  
 [আসে ফেদু মিয়া ও চিকু]  
 চিকু : চা চা এই সবের মধ্যে আমাগো কি দোষ?  
 ফেদু : আছে আছে । দোষ তরও আছে আমারও আছে । ওই স্বরন যা কইয়া গেল তা একেবারে মিছানা ।  
 চিকু : গেছে আপনার মাথা একরারে গেছে । কি বলতেছেন আবোল তাবোল ।  
 [ নেপথ্যে একটা মেয়ে কণ্ঠের চিৎকার । স্বামীর সাথে ঝগড়া করছে ]  
 ফেদু : কোন বাড়ীর আওয়াজ চিকু মিয়া?  
 চিকু : নি নি নিমাই সর্দারের বাড়ী থেইক্যা ।  
 ফেদু : নিমাই আইজকা মাছ মারতে যায় নাই? চলতো গিয়া দেহি ।  
 চিকু : চলেন [ ওরা বেরিয়ে যায়/আসে নিমাই ও মায়ী ]  
 মায়ী : আমি পরিস্কার কই । এ মাছ মারা কাম তুমি ছাইড়া শহরে যাও ।  
 নিমাই : তরে না কইছি আমার কামের মধ্যে তুই কথা কবিনা ।  
 মায়ী : ক্যান কমনা ক্যান? দিনের পর দিন তোমার সংসারে না খাইয়া থাকি । আমি কি মানুষ না আমার কি প্যাট নাই ।  
 নিমাই : তুই জানোসনা বাপ দাদার চৌদ্দ পুরুষের এই পেশা ছাড়া অন্য কোন কাম আমি জানি না । তাইতো প্রত্যেক দিন জাল লইয়া যাই, কিন্তু মাছ পাইনা?  
 মায়ী : এই হইল তোমার সংসার তোমার ঘরবাড়ী আমি চললাম  
 [ মায়ী বেরিয়ে যায় । ঢোকে ফেদু চিকু ]  
 ফেদু : আরে নিমাই কি, কি ব্যাপার । ঘরে বাইরে এমুন করতাছ ক্যান ।  
 নিমাই : সুখ নাইগো কাকা সুখনাই ।  
 চিকু : সুখ পাখি কি অ-অ অত সোজা নিমাই?  
 ফেদু : ক্যান তুইতো মাছ ধইরা মাছ বেইচ্যা ভালোই আছস ।  
 নিমাই : আর মাছ । কি যে সুইস গেট বানাইলেন । আমাগো কপাল ভাংলেন ।



ফেদু : এইটা তুই কেমন কথা কস নিমাই। আমরা সুইস গেইট বানাইছি? না বানাইছে সরকার।  
 চিকু : আপনি সেই কমিটির একজন না?  
 নিমাই : যেই বানাইক উপকারতো পাইছেন আপনারাই। যাই বউডারে ফিরাইয়া আনি। মায় মায় মায়। [ নিমাই বেরিয়ে যায়]  
 চিকু : নিমাই কতাতা কি কইল চাচা খেয়াল করছেন?  
 ফেদু : আরে কতাতো ঠিকই আছে। খালি কি ধান হইলেই চলবে। মাছের দরকার নাই?  
 চিকু : কি যে কন? চলেন হাটে যাই। হাটে কি মাছের অভাব নি চলেন।  
 ফেদু : চল, বাজারে গিয়া সবার সেরা মাছ টা কিন্যা আনি।  
 [ চাচা ভাতিজায় বেরিয়ে যায় সুত্রধর]

গান ৪

সুত্রধরঃ (মায় লাগাইছে পিরিতি শিখাইছে)

চাচা ভাতিজায়/ দুইজন বাজারেতে যায় (২)  
 যাইয়া পড়ে হতাশায়। নাইকোন মাছ  
 বাজার খালি হবে কি উপায় (২)  
 আমি কি বলিব আর  
 কে জানিত উজার হবে মাছের বাজার  
 এখন মাছে ভাতে বাঙালিদের কি হবে উপায়। (২)  
 বাড়াইতে জমির ফসল  
 বাধ দিয়া ঠেকাইছে পানি হইছে সফল  
 বিলে এখন পানিতো আর নাই  
 আমি বলি গো সবায় (২)

[ সুত্রধর চলে যায়। একটা বাজার। মাছের খালি ডালা নিয়ে মাছ বিক্রেতার বসে আছে। নেপথ্যে মিউজিক বাজে আসে ফেদু মিয়াও চিকু সর্দার। তারা মাইমের সাহায্যে বিভিন্ন ডালার সামনে যায়। মাছের ডালা খালি দেখে অবাক হয়। কোন ডালায় মাছ আছে দাম জিজ্ঞেস করে। দোকান দাররা দাম বলে। ফেদু মিয়া চেখ কপালে তোলে। বাজার থেকে বেরিয়ে যায়। দোকান দাররা চলে যায় ফেদু আর চিকু আসে।

চিকু : এইটা কি হইল চাচা। বাজারে তো কোন ডাল মাছ নাই। আর  
 ফেদু : কি যে কসনা তুই টাকা দিলে বাঘের চোখও মেলে বুঝছ  
 চিকু : মাগনা মাছ খাওয়ার দিনতো আগেই শেষ। অহন পাকট ভইরা টাকা দিলেই মাছ পাওয়া যায়না। চাচা গো আমরা খামু কি?  
 ফেদু : কুতা হারামি। আমি মরি আমার শোকে আর তুমি আছো তোমার মাছ খাওয়া  
 নিয়া।

[ মাছের ডালা মাথায় নিয়া দুজন হাটেছে। দুজনেরই মন খুব খারাপ। ফেদু ও চিকুর সামনে দিয়ে হেটে পার হয়ে যায় চিকু সামনে গিয়ে দাড়ায়]  
 চিকু : [গান] (৫)

মাছের ব্যাপারী তোমায় জিজ্ঞাসা করি  
 কত লাভ কইরাছ মাছ বেচিয়ারে (২)  
 তুমি তো মাছের ব্যাপারী করস যে কারবার  
 কি কারনে খালি দেখি মাছের বাজার (২)  
 কোথায় সন্ত সাধের মাছ  
 বলতে হবে আজ নউলে আমি ছারবোনা তোমায় (২)

বেপারী + মানুঃ

গোলা ভরা ধান ছিল জল ভরা মাছ  
 মাছের বংশ হইল ধ্বংস কার অভিমান  
 এখন মাছের নাই খবর, মরছে খালবিল হাওর  
 মাছ মারিব কোথায় মোরা গিয়ারে (২)  
 [ গান শেষে ব্যাপারীরূপে যতে থাকে।

ফেদু : ও বেপারীর পো এদিকে আও। কি মিয়া। আমার জলায় মাছ ধর আর আমার বাড়ী মাছ যায় নাই ক্যান?  
 মানু : মাছ জালে উঠলেতো যাইব। নিজে গোহিতো চলেনা।  
 চিকু : ও ওই ব্যাটা মুখ সামলাইয়া কথা কইস্  
 নীলকমল : তুই ই ই মুখ সামলাইয়া কথা কইস। কাম কাইজতো করসনা কষ্টের দরদ তুই কি বুঝবি।  
 চিকু : কি কি কি হা হা হা  
 ফেদু : তুই চুপকর। হ তা কি হইছে।  
 মানু : বড় মাছ। স্বাদের মাছ। গুড়া মাছ। সোয়াদ কইরা মাছ খাওনের আশা ছাইড়া দেন মাদবর সাব। সেই দিন কাউয়ায় খাইছে।  
 ফেদু : কি কি কইলি তুই জাউলার পো। আমার মুহুর উপর কথা তুই আমারে চিনস না?  
 নীলকমল : মাদবর সাব। এইবার আমরা কাউরেই মাছ দেইনাই। দেহেন নাই প্রতি বছর কাটা ভাঙলে আর বিল সেইচ্যা বড় মাছ আপনারে দেই। আপনার আগে বাবায়ি  
 দছে আপনার বাপেরে।  
 চিকু : তা তা তা তা (উত্তেজিত)  
 ফেদু : চুপ কর। তাইলে এইন হঠাৎ কইরা মাছ দেওয়া বন্দ করলি ক্যান? শীত নাই বর্ষা নাই বান তুফান যাই হউক তোরা আমার বিল বাওর জমি জমার উপায় দিয়া  
 মাছ ধরসনা। দিমু, দিমু সব বন্ধ কইরা

মানু : দেন বন্ধ কইরা দেন। আপনে বন্ধ করলেই কি আর সুযোগ দিলেই কি। এখন আর আপনার সেই জলাও তেমন নাই আর মাছ ও নাই বোয়াল, পাপাস, রুই গজার এই গুলোতো আগেই শেষ হইছে। এখন পুটি টেংরাও নাই।

নীলকমল : একটা দুইটা ও নাই। [ মানু চোখ মোছে]

মানু : ঘরে আইজ তিনদিন ধইরা একবেলা আধা বেলা কইরা খাইয়া আমরা আছি খন কইরা জাল বানাইছি অহন দেনা শোধ করাবার পারতাহিনা। আমরা জাউলার পোলা। মাছ ধরা ছাড়া আমাগো তো আর অন্য কোন কাম জানানাই। আর অহন জলায় তো কোন মাছ নাই।

চিকু : তা তা তা তে আমাগো কি এই দোষ কি আমাদের?

ফেদু : এমন যে হইব তাকি আমি জানতাম। তাইলে কি আর তগো কারেন্ট জাল মশারী জাল খেতা জাল দিয়া মাছ ধরবার দেই? তার পর আবার এক বছরে কয় বার কাঠা মারচস ক দেহি। মাছের ক্ষতি হইবো না। সুইস গেট আর নদীর সংযোগ খালে মাছ ধরছস ক্যান?

মানু : ভিন গায়ের ওরা আইস যে ধরে

চিকু : ভিন গা গা গা গা য়েতে কারা আসে

নীলকমল : তর চাচার হারামি

চিকু : কি কি কি কি

ফেদু : চুপ কর বেঞ্চল

মানু : সুইস গেট বানাইয়া সরকার আপনেগো বড় লাভ কইরা দিছে। সব বিল শুকাইয়া খঠ খটা। ইচ্ছা মত সুইস গেট খোলেন বন্ধ করেন। ধান বুনাছেন গোলা ভরতাহেন।

চিকু : মা মা মা যাইয় সাবনা ও মাস্টার সাব হোনেন হোনেন [ আসে মাষ্টার]

ফেদু : না এই জাইলার দল আমার মাছ দিবার চায়না না ভং ছং করে

চিকু : বে বে বে বে বেশি ক অ তা কয়

ফেদু : চুপ কর তরে না কইছি বেশী কতা কবিনা। পেটেতো কোন কতা চাপা থাকেনা।

মাষ্টার : এই টা নিয়া তোমরা নিজেরা তর্ক কইরোনা। সন্ধ্যা গেটের কাছে আইস

সবাই : জে আইছা [ এক এক করে সবায় বেরিয়ে যায় আসে সুত্রধর]

সুত্রধর : গান ৬

[ সুর : ও জীবনের আরে ও জীবন]

আরে ও মানুষের আরে ও মানুষ  
বুইঝাও বোঝনা  
নিজের হাতে আনলি বিপদ। তাও কি জনোনা মানুষের  
ও মানুষের ----  
নদী ভাঙ্গন বন্যার খেইক্য রে আরে ও মানুষ বাচিব বলিয়া  
বাধ দিয়াছ নদীর পাড়ে সকলে মিলিয়া (২)  
ও মানুষের -----  
তালুকদার গৃহস্থ যারা রে  
আরে ও মানুষে করেছে কি কাম  
সুইস গেইটা বন্দ কইরা বুনাছে বরো ধান (২)  
ও মানুষের  
শুকনা কালে ধরবো পানিয়ে আরে ও মানুষ  
যার কারনে বাঁধ  
তা না কইরা নিজের ঘাড়ে আইনাছে বিবাদ(২)

সুত্রধর [ সংলাপ] এমনি শত ভুলে মাঝে দিন যায় বাধের ভিতরে আর বাইরে মানুষের চেনন যখন হয়। সবাই গিয়া মিলে মাষ্টার মিয়ার কাছে।  
[ সুত্রধর চলে যায় একটা গুন্জন। ফেদু, চিকু, নিমাই, নীলকমল সহ আরো কয়েকজন আসে]

মানু : যার যার অধিকার তারই রক্ষা করা দরকার কি কও তোমরা?

নীলকমল : এই টা কোন কথা না আন্তার দুনিয়ায় সবাই নিজে নিজে বাইড়া ওঠার অধিকার আছে।

ফেদু : ওই জাইলারা। আমার জমিতে ধান হয় দইখ্যা তগো চোখ টাটায় ক্যান? নিজেগো দোষ অনেক ঘাড়ে চাপাস ক্যান?

নীলকমল : আমাগো কি দোষ কি কন?

চিকু : ত ত তরা কারেন্ট জাল মশারী জাল দিয়া মাছ ছাইক্য মারস না না নাই?

ফেদু : তগো যদি একই জমির অভাব তাইলে আমার জমিতে দান লাগা। কামলা দে, রিক্সা চালা

নীলকমল : বাপ দাদার পেশা ছাইড়া দিমু কনকি আপনে? মানুষের প্রতি আপনার কোন দয়া মায়া নাই?

চিকু : তা তা তাইলে ভিক্ষা কর গিয়া !!

ফেদু : হ তাই কর!

মানু : সারা জীবন আমাগো মাছ মাগনা খাইলেন আর অহন ভিক্ষা করতে কন।

ফেদু : দেখ জাইল্যা বাড়া বাড়ী হইতা ছে।

মাষ্টার : তোমরা এই সব কি শুরু করল। তোমাগো ডাইকা আনলাম একটা পরামর্শ করার লাইগা আর তোমরা কিনা ----

নীলকমল : আপনেই কন মাষ্টার সাব। সুইস গেট কমিটির প্রধান হইল মাদবর চাচা। আর সে যদি আমাগো বিপদাপদ না দেখে। যখন পানি দরকার তখন গেট ফেলে আর যখন পানির দরকার নাই তখন খুইল্যাদেয়।

মাষ্টার : মাদবর ঠান্ডা মাথায় কথাটা তোমায় বোঝা দরকার। আসলে ব্যাপার হলো বর্ষার প্রথম জোয়ারের সময়ই বেশী ভাগ মাছ ডিম ছাড়ে। আর নদীর মাছেরা ডিম ছাড়ার জন্য চলে যায় বিল বাওরে কম স্রোতের জায়গায়। আর বিলের মাছেরা যায় নদীতে। তা বাধের সুইস গেট যদি আমরা বন্ধ রাখি তাহলে কি এই যে বংশ বিস্তারের কথা বললাম তা কি করে সম্ভব।

সবাই : না কিছুতেই সম্ভব না।  
 মাষ্টার : মাদাবর। তুমি এলাকার প্রধান। এ বিষয়ে তোমার সচেতন থাকা খুবই দরকার। গর্ভবতী মায়ের যত্ন আমরা যেমন করে নেই। আর যত্ন ফলে আসে একজন সুস্থ শিশু আর তেমনি ডিম ওয়াল্লা মাছের যদি নিরাপদ ডিমপাড়ার স্থান আমরা করতে পারি। আর নেই পোনা বড় হওয়ায় সুযোগ যদি আমরা করে দেই তা হলে ভেবে দেখ। কত লক্ষ্য কোটি মাছ আমাদের নদী নালায় হবে।  
 চিকু : মা মা মা মাষ্টার স্যার। এই শ শ শয়তান গুলো গোট খুললে পবে ফাঁশের জাল দিয়া সব রেনু পোনা ধইরা ফালায়  
 মাষ্টার : এইটা কিন্তু তোমাদের বড় অন্যায় মানু-- নীলকমল  
 মানু : মাষ্টার সাব যদি সময় মত গোট খোলে। তাহলে আমরা কথা দিলাম বেবাকতে মিথ্যা আমরা গোট পাহাড়া দিমু।  
 ফেদু : মাষ্টার স্যার আমি এই ছ্যামড়াগো বকা বকা দেই। মারি পিটাই কিন্তু মাছের বংশের ক্ষতি হইক এই টা আমি চাইনা। ছোট মাছ, মলা, ঢেলা, বাতাসি না খাইলে আমার নাতি নাতিনির চোখের জ্যোতি বাড়বো ক্যামনে?  
 মাষ্টার : নাতি নাতিনির চোখের চিত্তা যেমন। নিজের চিত্তাও তো করতে হবে মাদবর তোমার কি মনে পড়েনা কত জাতের মাছ তুমি খাইছ। এক সময় আহা হা হা কত সুন্দর নাম বোয়াল, পাংগাস, রুই কাতল।  
 ফেলু : নলা, মুগেল, চিতল, ঘোল, গজার, বাইম, আইড়, কই পাবদা  
 চিকু : টাকি, বাইল্যা, খল্লা, চিংড়ি, টেংরা, খইলশা, গুইলমা  
 মাষ্টার : মোলুদি বাতাশি, চান্দার, স্বরপুটি, ফলি।  
 পেদু : আহা আহা হা হা  
 চিকু : আহা হা হা বা (হাস্য কর পরিস্থিতি)  
 সুপ্রদর : গ্রাম্য পুথির সুরে গান (৭)

শোনের সুধিজন (২) নিবেদন আমি করে যাই।  
 বহুজাতের মাছ এখন আর বাংলাদেশে নাই  
 কারন অযতন (২) অ- সচেতন দেশর মানুষ ভাই  
 ধরছে জালে দিছে গালে পরের কামাই  
 ভাবছে এইতো জীবন (২) খোদার ভুবন নাইতে কিছু কর্ম  
 অবহেলা বেলা গেছে ফুরাইতেছে দম  
 এখন হায় হতাশে (২) এই মানুষে করতেছে হায়হায়  
 আগামী দিন কেমনে যাবে হবে কি উপায়  
 মাথায় পড়ছে বাড়ী (৩)

[সুপ্রদর বরে যায় সবাই নড়ে চরে বসে গুঞ্জন সৃষ্টি হয়]

ফেদু : এই কথা গুলো আমার আগে আগেই ভাবা উচিত ছিল।  
 মানু : সুইস গোট টা যদি সময় মতো খোলেন, প্রথম জোয়ার আসলে খোলেন  
 নীলকমল : শুকনা কালে বিলে একটু পানি থাকলে বিলের মাছ গুলো বড় হয়। আর তাইলে বর্ষার মওসুমে অনেক মাছ পাওয়া যায়।  
 মানু : যদি শুকনা কালে গেইট দিয়া অল্প অল্প পানি ছাড়েন তো মাছের ক্ষতি হয়না কিন্তু একে বারে খুইলা দিলে  
 মাষ্টার : সুইস গোটের এত উপকার তা আগে জানতামনা কাইলই সুইস গোট কমিটির মিটিং করব।  
 চিকু : ক্যা ক্যা ক্যামনে মিটিং করবেন। অ আ আপনার সদস্যরা তো কেউ থাকে ঢাকা কেউ রাজ শাহী কেউ  
 ফেদু : বাদ বাদ সব বাদ। আমি এই সব লোকগুলোর কমিটিতে নিমু। যারা এলাকায় থাকবো তারাই গোট চালাইবো।  
 চিকু : জাইলাগো নিবেন  
 সেদু : চুপ কর ব্যাটা  
 চিকু : সব ক ক ক কতাই চুপ করতে কন ক্যা ক্যাকা  
 ফেদু : এরা এরাই আমার কমিটিতে থাকবো মানু, নীলকমল, নিমাই, মাষ্টার স্যার এরা এলাকায় থাকবো তারাই সুই গোট চালাইবো। আমি ডিস্ট্রিক্টের বড় সাহেবের লগে আলাপ করব। মাছের বংশ আর ধবংশ হইতে দিমুনা।  
 মাষ্টার : নিয়ম মাইনা সুইস গোট চালালে তোমাদের ধান চাষেরও কোন ক্ষতি হবেনা।  
 (আসে সুপ্রদর গান)  
 প্রথম জোয়ার আসিলে সব মাছে যায় ভরে  
 সুইস গোট খোলা রাখার কথা যাবেন না ভুলে  
 তখন মাছের বংশ রক্ষা হবে বাড়বে ফলন দ্বিগুন  
 মাছের বাজারে আর লাগবে না আগুন।  
 [ আসে মহিলা সমাজ কর্মী]  
 আপা : কি নিয়ে কথা হচ্ছে আপনাদের। স্যার সম্রামলাইকুম  
 মানু : আপা সুইস গোটের সমস্যা নিয়া কথা হইতছিল।  
 মাষ্টার : তুমি আসছো ভালোই হইছে দীর্ঘদিন ধইরা এই এলাকায় মাছের সমস্যা হচ্ছে।  
 সুইস গোটের কারনে মাছ প্রায় উধাও হয়ে গেছে।  
 আপা : আপনারা যদি মনোযোগ দিয়ে আমার কথা শোনেন তা হলে একটা কথা আপনাদের আমি বলতে পারি  
 সবাই : [ রিস্ময়] কি কথা  
 আপা : না এতে কোন পরশা খরচ করতে হবেনা আপনাদের।  
 ফেদু : সবতো আমরা মিমাংশা কইরা ফালাইছি।  
 চিকু : হাতি ঘোড়া গেলো তল মশা বলে কত জল।

সবাই : আমরা আফার কথা হুন্তি চাই।  
 ফেদু+চিকু : ভয় পেয়ে! আচ্ছা ঠিক আছে।  
 মাটার : এ মেয়েটা যা বলবে এ এলাকার ভালোর জন্যই বলবে  
 ফেদু : অহিচ্ছা কও  
 আপা : সুইস পোট পারিচালনার সাথে সাথে মাছের উৎপাদন বাড়ানোর অনেক পথ আছে।  
 সবাই : সেইটা কেমন?  
 আপা : এই যে বিলের মাঝখানে গভীর জায়গা সেখানে ডাল পালা ফেলে রাখুন। তবে সব সময় মাছ ধরবেন না। সঞ্চয় রেখে তার পর মাছ ধরবেন।  
 মাটার : ভূমি কি চিত্তাকর্ষে! অভয় অশ্রমের কথা বলছে  
 আপা : আপনি ঠিকই ধরেছেন। মাছের জন্য নিরাপদ স্থান তৈরী করুন যেখানে মাছ নিশ্চিন্তে নির্বিঘ্নে বাড়তে পারে। কিন্তু আমি বলছি। মাছ সঞ্চয়ের কথা  
 চিকু : নামেই অভয়াশ্রম। দিন ভইরা পাহাড়া দিন আর রাইতের বেলা চুরি করবে।  
 ফেদু : [রেগে গিয়ে] আর একটা কথা কইলে জুতা দিয়া পিটাইয়া দিমু।  
 আপা : না না অভয়াশ্রম আর সঞ্চয়গার এক কথা নয়। অভয়াশ্রম হচ্ছে যেখানকার মাছ কখনই ধরা যাবেনা। আর সঞ্চয়গার হচ্ছে জলা ভূমির গভীর অংশে মাছ সঞ্চয় রেখে পরিমিত ভাবে সঠিক আকৃতির মাছ ধরা যাবে। তবে এখানে খুবই সাবধান থাকতে হবে কেউ যাতে নিষিদ্ধ জাল দিয়ে মাছের সঞ্চয় নষ্ট না করে।  
 মাটার : কিন্তু বড় নদী থাইকা মাছতো আসতেই পারে না।  
 আপা : এটা একটা দরকারী কথা বলেছেন। না যেনে জেলেরা মাছ ও রেনু গেটের কাছে আসার আগেই সংযোগ খালে ধরে ফেলে। আমরা যদি এই মাছ ধরা বন্ধ করতে পারি তাহলে বিলে মাছের আর অভাব হবে না।  
 ফেদু : আচ্ছা আমরা যে ইরি বোরোতে সেচ দিয়া আগেই খাল বিল শুকাইয় ফলাইতেছি এতে কইরাওতো মাছ কমতেছে।  
 মাটার : হ হ ইরি বোরো না কইরা অন্য ফসল আবাদ করলে বেশী লাভ পাওয়া যায়।  
 ফেদু : হেইডা আবার কেমনে  
 আপা : এ যেমন ধরেন পিযাজ, মরিচ, রসুন, শাক সবজি যে সব ফসল করতে বেশী সেচ দেয়া লাগে না। আমার যা বুঝানোর আমি বুজিয়েছি এবার স্মরন আলী বাকি কথা গুলো গানে গানে বলবে। স্মরন চকিদার।  
 সূত্রধর : জেঁ আফা  
 আপা : এদের কে বুঝিয়ে বলেন  
 সূত্রক : জেঁ

[ গান ]

[এখানে মাছের মুখোশ পড়ে কয়েকজন নদীতে বিলে বরে বেড়ায়]

ধীরে ধীর সকল বরিয়ে গিয়ে একটা নদীর পরিবেশ/ বিলের পরিবেশ তৈরী করে।

-গান ৮

সূত্রধর :

চল মন চলবে ভোলা বসবে আবার মাছের মেলা  
 খালে বিলে নদী নালায় সঞ্চয়গার গড়বে সবাই।  
 সঞ্চয়গার রাখবে সঠিক ফলবে তাতে মাছ অধিক  
 পরিমিত যায়বে মাছ তাতেই আবার জুটবে আবাস

## English version of drama script (a musical play with the participation of actors and actresses):

### First Scene

View of a rural market; a member of UP (also chairman of Sluice Committee) and his assistant is moving around. They met a few traditional Hindu fishermen and asked for fish. They were receiving fish without any price historically. The fishermen reported that there is no fish in the beel. Number of fish has drastically decline and they are not able to give them any fish. The member did not trust them and had an argument with them. The fisher blamed the sluice gate for the decline of fish. The UP member along with the assistant went to the market and came back with a unhappy mood. They found no fish in the market.

### Second Scene

The Hindu fishermen had problem in their family. The family member to quit the village and go out in search of other jobs insisted them. The fishermen declined to leave their traditional occupation. The UP member arrived the place. The fishermen informed him how the fisheries situation has been drastically changed. They mentioned about the non-functional aspects of the Sluice gate. There is no one to open the gate at the beginning of monsoon. The UP member also blamed the fisher as they were thought to be accused for the fishing in the monsoon period. The fishermen made his realized that the Sluice gate only helped the farmers but if it managed properly and the all stakeholders in the community represent the committee then it might bring in fortune for them. The UP member also urged for the fish. He thinks it is only required for him it might help the next generation.

### Third Scene

The local Schoolteacher participated in the meeting of the fisher and UP member. The UP member promised to form a new sluice gate committee in order to ensure the participation of the fishermen. They had a consensus. At that time the lady representing the fisheries

extension service came. She informed the community about the benefits of harvest reserve. She described the differences between harvest reserve and sanctuary. People were convinced as they heard from her that they will be allowed to do the fishing in a controlled way on the other hand it would help them conserving the fish resources. She describes the selection criteria of harvest reserve. The people found it very convenient and this inspired them

#### Fourth Scene

People are dancing and singing with the hope that the whole Bangladesh floodplain will become full of fish again. How the Good impacts of better Sluice gate management and establishment of Sanctuaries would increase the fish population is described in the songs.



## **Annex 3. Bangladesh project inception workshop**

### **Inception Workshop Briefing Note**

#### **FMSP Project R05/07 – Floodplain fisheries management guidelines – Inception Workshop**

**Host: BCAS, Venue: BRAC Centre, Mohakhali, Dhaka, Bangladesh, 3–4 May 2005**

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#### **Background**

Since 1992, the Fisheries Management Science Programme (FMSP) of the UK Department For International Development (DFID) has produced a series of outputs about the management of inland water fish stocks. These have shown, among other things, that inland fish production could be increased by the careful placement and management of fishery reserves or sanctuaries, and by measures maintaining the natural migration patterns of riverine 'whitefish' stocks. In flood control / irrigation systems, the operation of sluice gates at key times of the year has a critical role in maintaining fisheries as well as providing water for agriculture.

These FMSP projects have developed a strong biological basis for the management of fish stocks in floodplain river systems. The projects of DFID's Natural Resources Systems Programme (NRSP) have also developed 'systems' guidance on the integrated management of floodplain resources, recognising the needs of multiple resource users, especially the poor.

This project (R05/07) aims to integrate such DFID FMSP and NRSP-developed knowledge with other relevant experience of other agencies. Critical elements of the combined knowledge base will be identified and actively promoted in Bangladesh and in India, and disseminated widely throughout the Asian region, according to the communication needs of different stakeholders.

The new communication products required will be agreed with stakeholders at the project inception workshop and outlined in a communications plan. Potential promotion pathways for different target stakeholders include inter-sectoral workshops and personal meetings at a national level; and focus groups, drama, video and 'pot songs' for sluice gate and fisheries managers at the local level. Manager-level reports, leaflets, newsletters, posters, flyers etc could also be distributed as hard copy products, or electronically on web sites or via e-groups etc.

#### **This workshop**

This inception workshop will identify and present the key messages and products from the FMSP and NRSP floodplains projects (both technical and institutional) and seek related knowledge from the participants which could be included in the project outputs. Key communication stakeholders will be consulted about their current practices and knowledge of Asian floodplain fisheries. The workshop will then identify and prioritise key opportunities and pathways for the active promotion of the FMSP and other knowledge within target locations. With this information, the project will update its draft communications plan to maximise the impact of project outreach activities. Particular account will be taken of the knowledge generated by the NRSP projects on the most appropriate ways of interacting with target stakeholders. Invitations are being issued to communication stakeholders from the DFID-target locations of Bangladesh, West Bengal, India, and the Mekong region.

The workshop will also identify indicators and processes by which the uptake of the project outputs will be monitored both within and beyond the term of the project. An inception report detailing these agreements will be submitted to FMSP management and workshop participants after the meeting.

Following this workshop, the new outreach materials will be developed as agreed in the communications plan. In July and August, a series of meetings will be held in Bangladesh and India to present and test these draft new materials with communication partners. By 21 October 2005, tested materials will be disseminated to Mekong and wider Asian audience via electronic and/or other channels.

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#### **Sponsor: DFID Fisheries Management Science Programme (FMSP)**

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Websites: <http://www.mragltd.com/>, <http://www.fmsp.org.uk/>, <http://www.dfid.gov.uk/>

#### **Host: Bangladesh Centre for Advanced Studies (BCAS)**

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Tel: + 88 02 885 2217

## Inception Workshop Programme

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### Day 0 – Monday 2 May 2005 – Pre-workshop event

National dissemination workshop of FMSP Project R8210 - The use of sluice gates for fish stock enhancement and diversification of livelihoods (09.00 – 14.00)

### Day 1 – Tuesday 3 May 2005

08.30 Registration

#### Session 1. Opening Ceremony

08.55 Guests take their Seats

09:00 Recitation from the Holy Quran

09.05 Welcome Address

: Dr. A. Atiq Rahman

09.15 Introductions and background to the workshop and project

: Dr. Daniel Hoggarth

09.30 Address by special guests:

: Mr. Enamul Huq, Dir, DAE

Mr. Md. Nasir Uddin, DG, DoF

10.05 Address by chief guest

: Mr. Md. Abdul Karim,

Secretary, MOFL

10.20 Address by chair

: Dr Saleemul Huq

10.30 *Tea / Coffee*

:

#### Session 2. Review of FMSP floodplain fisheries management knowledge and communication products

11.00 FMSP Projects R5030, R7834, R5953 and R4791 (river fishery modelling)

: Dr. Daniel Hoggarth

11.20 FMSP Projects R5953 (river fish migrations) and R7043 (river fishery reserves)

: Dr. Daniel Hoggarth

11.40 FMSP Projects R6494 (enhancement and aquaculture)

: Dr. Saleemul Huq

11:50 FMSP Project R7917 (self-recruiting species in aquaculture)

: Mr. Faruk Ul Islam, ITDG

12:00 FAO Fisheries Technical Paper 384/1 (Management Guidelines for Asian River Fisheries)

: Dr. Daniel Hoggarth

12.15 FMSP Projects R4778J and R8210 (sluice gate management and global warming)

: Dr. Saleemul Huq

12:30 FMSP Project R5485 (Ganges Basin)

: Dr. Daniel Hoggarth

12.35 Discussion of FMSP knowledge base and products

: Participants

12.50 Remarks by the Chair

: Dr. A. Atiq Rahman

13.00 *Lunch and Prayer*

#### Session 3. Review of other DFID floodplains knowledge and communication products

14.00 NRSP LWI projects including R6756, R7868, R6744, R8195 and R8306:

: Mr. Mokhesur Rahman

14.40 DFID Water ERP Project R7235 and KAR project R7793 (irrigation impacts on fisheries)

: Dr. Daniel Hoggarth

14.50 Comments by the Chair

: Dr. A. Atiq Rahman

#### Session 4. Review of other floodplain fisheries management knowledge and communication products

15.00 Lao PDR Fisheries (and Mekong River Commission)

: Mr. Kamphet Roger, LARReC

15.10 WorldFish Centre including CBFM-2 Project

: Dr. M.G. Mostafa

15.20 STREAM

: Dr. Daniel Hoggarth

15.30 *Tea / Coffee*

15.50 Fourth Fisheries Project

: Mr. Kafil Uddin Kaiya, DoF

16.00 MACH Project

: Mr. Mujibur Rahman

16.10 Discussion of overall knowledge base needs and Day 2 plans

: Participants

16.50 Remarks by the Chair

: Dr. Saleemul Huq

17.00 Close

**19.30 Workshop Dinner at EFES Restaurant, Gulshan-1, Dhaka-1212**

## Day 2 – Wednesday 4 May 2005

NB: Original plan given below. Sessions 7 and 8 were reduced to a short plenary discussion to allow the workshop to close early at 2.30pm, and were covered by the project team instead on Thursday 5 May.

### **Session 5. Communication stakeholders – Knowledge, attitudes and practices (KAP)**

09.00	Review of draft project communications plan and matrix	: Dr. Daniel Hoggarth Dr. Saleemul Huq
09.30	Identification of key communication stakeholders (personal contacts etc)	: Dr. Saleemul Huq
10.00	KAP survey of participants / others (to enable update of communication matrix)	: Dr. Daniel Hoggarth
10.25	Comments by the Chair	: Dr. A. Atiq Rahman
10.30	Tea / Coffee	

### **Session 6. Communication mechanism with different stakeholder groups**

11.00	Brainstorming and demonstrations of preferred media, channels (pathways) and products for each communication stakeholder group (as defined in communications matrix)	: Dr. Daniel Hoggarth Dr. Saleemul Huq
11.50	Comments by the Chair	: Mr. Mokhlesur Rahman

### **Session 7. Planning for the production of new materials (Group Discussion)**

12.00	In working groups, develop structures/outlines/content of selected products, showing formatting/styles etc, and identify tasks, responsible persons and milestones for next phase (production of first draft materials by 4 July for review by Bangladesh stakeholders)	: Dr. Daniel Hoggarth
13.00	<i>Lunch and Prayer</i>	:
14.00	Presentation of group discussion findings	: Working group leaders
14.30	Open discussion	: Participants
14.55	Comments by the Chair	: Dr. Daniel Hoggarth

### **Session 8. Planning for project monitoring and evaluation (M&E)**

15.00	Summary of FMSP needs for project reporting and evaluation	: Dr. Daniel Hoggarth
15.10	Brainstorming and identification of M&E indicators for project OVs	: Dr. Mahbub Alam
15.30	Tea / Coffee	:
15.50	Agreement on who to collect which data for indicators	: Dr. Mahbub Alam
16.00	Comments by the Chair	: Dr. A. Atiq Rahman

### **Session 9. Workshop conclusions and wrap up**

16.10	Confirmation of revision of communications plan, log frame and M&E plan agreements, next steps, AOB etc.	: Dr. Daniel Hoggarth Dr. Mahbub Alam
16.40	Workshop evaluation	: Dr. Daniel Hoggarth
16.50	Concluding remarks/comment by the chair	: Dr. Saleemul Huq
17.00	<i>Workshop close</i>	:

## List of participants

Day 1 - Tuesday, 3 May 2005.

	Name of Participants	Name of Organization Address & E-mail	Telephone & Mobile No.
1	Khorshed Alam	AMRF	
2	Prof. Dr. Md. Aminul Islam	BAU, Mymensingh	011074401
3	Dr. Zoarder Faruque Ahmed	BAU, Mymensingh, Associate Professor	0172-269016
4	Azra N. Ahmad	BCAS	8851237
5	Dr. Atiq Rahman **	BCAS, Director	8851237
6	Dr. Saleemul Huq **	BCAS, Director	8851237
7	Faruque Ahmed	BCAS, Program Manager	8851237
8	Khandaker Mainuddin	BCAS	8851237
9	Mahbub Alam **	BCAS, Anthropologist	8155049
10	Md. Abdul AliM	BCAS	8851237
11	Md. Belayet Hossain	BCAS	8851237
12	Mr. Md. Liaquat Ali **	BCAS	8851237
13	Nasreen Rahman	BCAS	8851237
14	S.M. Alauddin **	BCAS	8851237
15	Sarder Shafiqul Alam **	BCAS	8851237
16	Shohel Pervez	BCAS	8851237
17	Tanzeba A Haq	BCAS	8851237
18	M.A. Khair	BRAC	
19	Md. Korban Ali	BWDB, Executive Engineer	9872846 / 0171-246715
20	Mohammad Ali	BWDB, Executive Engineer/ Design-5	0171221159
21	Zulfikar Ali Howlader	BWDB, Planning – Dhaka, Executive Engineer	0171345 716
22	Md. A. Wadud Bhuiyan	BWDB, Superintending Engineer	9567239
23	Anisul Islam **	CNRS	9886514
24	Dr. Mokhesur Rahman **	CNRS	9886514
25	Enamul Hoqu	DAE, Director	8117328 / 0031357
26	Dr. M. Shafi	Dhaka Univ.	9662255
27	Md. Motaher Hossain	Dhaka Univ.	977384
28	Nasir Uddin A.	DOF, Dir. General	
29	Md. Kafiluddin	DOF, Asstt. Director	
30	Md. Mahabubur Rahman Khan	DOF	9571696
31	Md. Rafiqul Islam	DOF, Director (FRSS)	9560526 / 0171548236
32	Arne Andearsson	FFP, Manager	0139 253888
33	A.M. Kamal Uddin	ICZMP	
34	Dr. Md. Liakath Ali	ICZMP, PDO	8826614
35	Andrew Jenkins	IPSWAM/ BWDB	0175007244
36	Faruk-Ul-Islam	ITDG-B	9123671
37	Mohammad Ali	ITDG-B	8111934
38	Rakibul Haque	IUCN Bangladesh	9890395
39	Md. Manirul Islam	IWM	011-102329
40	Mr. Nur Alam	Kari (Hazar)	
41	Khamphet Roger	LARReC, Lao PDR	856-21-020 5699416
42	Md. Abdul Karim	Ministry of Fisheries & Livestock, Secretary-in-Charge	
43	Qazi Khaze Alam	Proshika, Dir. (Natl. Resources)	0171548170
44	Dr. Daniel Hoggarth **	SCALES Inc.	+1246 434 0919
45	Shyamal Borman	SDA	019102328
46	Md. Ekram Ullah	WARPO	9880879
47	SAM Rafiquzzaman	World Bank	
48	Dr. M.G. Mustafa	WorldFish Centre, Bangladesh, Fisheries Coordinator	0175007632

NB: See below for acronyms / \*\* = Project staff

## Day 2 - Wednesday, 4 May 2005

	Name of Participants		Name of Organization Address & E-mail	Telephone & Mobile No.
1	Dr. Atiq Rahman	**	BCAS, Director	8851237
2	Dr. Saleemul Huq	**	BCAS, Director	8851237
3	Kh. Mainuddin		BCAS	8851237
4	Mahbub Alam	**	BCAS, Anthropologist	8155043
5	Md. Abdul Alim		BCAS	0174 019977
6	Mr. Liaquat Ali	**	BCAS	8851237
7	S. M. Alauddin	**	BCAS	8851237
8	Sardar Shafiqul Alam	**	BCAS	8851237
9	Shohel Pervez		BCAS	0172 209020
10	Tanzeba A Haq		BCAS	8851237
11	Faruque Ahmed		BCAS, Program Manager	8851237
12	M. A. Khan		BRAC	
13	Md. Shahidul Islam		BRAC	0176 466131
14	Md. A Wadud Bhuiyan		BWDB	9567239
15	Md. Korban Ali		BWDB	
16	Mohammad Ali		BWDB	0171 221159
17	Dr Mokhlesur Rahman	**	CNRS	9886514
18	M. Anisul Islam	**	CNRS	0171 813407
19	A.K.M. Enamul Haq Mia		DAE	8117328 / 8051357
20	Md. Motaher Hossain		Dhaka University	977384
21	Prof. Dr. Md. Aminul Islam		Dhaka University	9662255
22	Md. Billal Hossain		DOE, Agargaon	
23	Md. Rafiqul Islam		DOF, Director (FRSS)	9560526
24	Md. Kafiluddin		DOF, Assistant Director	9560653
25	Arne Andearsson		FFP, Manager	0189 253888
26	Abu M Kamal Uddin		ICZMP, PDO	
27	Mohammad Ali		ITDG	0171 027474
28	Faruk Ul Islam		ITDG-B	0172 532388
29	Rakibul Haque		IUCN Bangladesh	
30	Khamphet Roger		LARReC, Lao PDR	856-21 020699416
31	Shahnaz Perveen		MACH	0173 012788
32	Qazi Khaze Alam		Proshika, Dir. (Natl. Resources)	0171 548170
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35	Md. Ekram Ullah		WARPO	9880879

### Acronyms

AMRF	Alternative Movement for Resource and Freedom Society
BAU	Bangladesh Agricultural University
BCAS	Bangladesh Centre for Advanced Studies
BRAC	Bangladesh Rural Advancement Committee
BWDB	Bangladesh Water Development Board
CNRS	Centre for Natural Resource Studies
DAE	Directorate of Agriculture
DOF	Department of Fisheries
FFP	Fourth Fisheries Project
FRSS	Fisheries Resources Survey System
ICZMP	Integrated Coastal Zone Management Plan
IPSWAM	Integrated Planning for Sustainable Water Management
ITDG	Intermediate Technology Development Group
IUCN	International Union for Conservation of Nature and Natural Resources
IWM	Integrated Water Modeling
MACH	Management of Aquatic Ecosystems Through Community Husbandry
PDO	Project Development Officer
SAD	Sustainable Development Associates
WARPO	Water Resources Planning Organization



## Annex 4. Project Communications Matrix (as updated at Inception Workshop)

Notes: Communication materials to be prepared in both english and bangla for national and district level Bangladesh stakeholders [1-4], in bangla only for Bangladesh local levels [5, 6, 8] and in english only for Indian/regional and DFID stakeholders [9, 10]  
 Bangladesh policy and manager level activities to focus on DOF 'Fish Fortnight' where appropriate and feasible, at a date yet to be announced in July/August  
 Bangladesh sluice gate managers' activities to coincide with critical 'open-gate' time at start of flood (~June, depending on rains)  
 Bangladesh sanctuary training activities to be held in September to coincide with approaching dry season

Communication stakeholders	Research Product / message to be communicated	Current knowledge, attitude, practice of stakeholders	Communication objectives: Desired outcome of communication / promotion	Communication channels and media in which research product will be communicated	Approach to monitor and evaluate implementation of communications plan
1. National policy makers in Bangladesh					
Min. of Fisheries & Livestock	Guidelines on fish sanctuaries, stocking and self recruiting species (SRS)	National policy makers in Bangladesh have tended to prioritize their own sectors but are now more aware of the need for integrated management. National water policies now require management of sluice gates for multiple beneficiaries; national fisheries policy requires sanctuaries and CBFM, and sanctuaries are now being developed in FFP, CBFM2, MACH sites.	Enhanced level of awareness amongst key national level policy makers on the importance of integrated resource management, and adaptive, dynamic management approaches, and the need for more widespread use of sanctuaries, and better design of FCDIs including 'fish friendly' sluice gates and their management in new projects. Awareness raised also on relevant approaches to future climate changes impacts.	<ul style="list-style-type: none"><li>- Policy briefs (co-authored where possible by senior ministry staff)</li><li>- Policy dialogue with key influential stakeholders in one-to-one meetings and small multi-stakeholder workshops</li><li>- Sponsorship of Fish Fortnight seminar with DOF about floodplains management</li><li>- Depending on suitable timing... promotion of key FMSP messages into draft 'Parliamentary Policy Paper on Fish Sanctuaries' (may already be finalised)</li><li>- Copies of outputs to be given to national policy makers who are unable to attend the workshop</li></ul>	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
Min. of Agriculture	Guidelines on sluice gate management and FCDI design re water needs for fisheries production (noting also NRSP guidance)				
Min. of Water Resources					
Min. of Land	Need to release more jalmohol land for use as sanctuaries; evidence of benefits etc				
MPs	Need for integrated management and new knowledge of floodplain dynamics and management options				

2. Natural resource researchers and trainers in Bangladesh					
University academics / research institutes	FMSP knowledge on FCDI and sanctuary impacts and assessment methodologies	Aware of need for integrated floodplain management but need examples, tools, methodologies, etc	To raise capacity for training and awareness of source materials (NB: may need assistance with internet browsing etc)	- Provision of PowerPoint packages for incorporation into existing training programmes (eg. FRI, WDB, Dhaka University Fisheries Dept, BAU Mymensingh Fisheries Dept.)	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
Training institutes (govt & NGO)	FMSP guidelines (as appropriate to each training institute)				
BCAS and CNRS 'Centres of excellence in floodplain knowledge'	Full suite of FMSP knowledge, including awareness of NRSP, KaR etc outputs	Already well established and institutionally linked with Bangladesh agencies and projects	Enhanced knowledge of technical options and tools for integrated floodplain management	- Preparation of 2-page summaries of FMSP (also to contribute to FMSP programme level database) to complement summaries of other Bangladesh projects  - Development of web sites to provide access to e-docs and directions to hard copy grey literature in library	
3. National managers/planners in Bangladesh					
DOF	Guidelines on fish sanctuaries, stocking, SRS	Most sub-sectoral stakeholders (e.g. fisheries, irrigation, agriculture navigation, etc) unaware of integrated water management issues, or of <i>how</i> to implement new policies for sanctuaries and integrated sluice gate management	Water sector managers better able to implement integrated water management on floodplains, recognising multiple objectives of agriculture, fisheries and other sectors	- Presentation of management guidelines and policy briefs at senior managers monthly meetings, including emphasis on planners of new FCDI projects (e.g. as PowerPoint presentations + leaflets and/or other hard copy handouts)  - Articles for BCAS 'Bangladesh Environmental News' newsletter, also submitted for use by other agencies' newsletters (e.g. ITDG, CBFM-2, BWDB 'Pani Parikroma' – 'Water Circulation', DOF Fish Fortnight Souvenir magazine, DAE Agric. Info. Service Monthly mag.)	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
Dept of Agric. Ext.	Guidelines on sluice gate management and FCDI design				
BWDB					
WARPO					

4. Local level managers in Bangladesh					
Fisheries managers at district / upazilla level	New national policies for water and fishery management in Bangladesh. FMSP guidelines on sanctuary selection and management, SRS and sluice gate operation and benefits of use.	Many local level officers not aware of national policy developments or need for integrated management	Adoption of national policies and improved local management practices	<ul style="list-style-type: none"><li>- Briefings at upazilla monthly meetings in 2-3 priority locations (to be selected by DOF Director of FRSS, Rafiqul Islam)</li><li>- Distribution of FMSP guidelines in leaflet form in priority locations (see DFID SUFER project guidelines for formats)</li><li>- Newsletter articles (see 3 above)</li></ul>	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
Agriculture managers at district / upazilla level					
Water managers at district / upazilla level					
Local govt. admin.					
5. Local floodplain resource managers in Bangladesh					
Sluice gate management committees / operators	Guidance on management of sluice gates for multiple benefits	Sluice gate operators currently unaware of potential for complementary use for both agriculture and fisheries and/or unaware of national policies for equitable operation	Sluice gate managers adopt new guidelines for operation of sluice gates to favour fisheries as well as agriculture	<ul style="list-style-type: none"><li>- Focus groups / training in FMSP sites in Tangail and Pabna, to coincide with start of flood (~June), including hard copy materials as available at this early project stage</li></ul>	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
NGOs / CBOs in existing project sites	Guidelines on sanctuary site selection and management (+ others as per interest in each site)	Open to idea of sanctuaries but limited experience in using	Enhanced capacity for use of sanctuaries (allowing for integrated management needs)	<ul style="list-style-type: none"><li>- Focus group meetings with selected CBOs at project sites of CBFM2, FFP</li></ul>	
6. Floodplain resource users					
Fishers	Need for sustainable and equitable resource use, and biodiversity needs etc. Guidelines and benefits of sluice gate management and sanctuaries.	Poor awareness of need for sustainable management e.g. using sanctuaries; fish out all dry season waterbodies whenever possible	Encourage respect for new sanctuary initiatives emphasising long term livelihood benefits	<ul style="list-style-type: none"><li>- Street theatre + pot songs – up to 10 locations/performances at selected sites, during Fish Fortnight, with invitations to TV media to film and distribute nationally</li><li>- Newspaper article prepared (based on newsletter material) and promoted to target ‘green’ newspapers (e.g. ‘Bangla Daily’)</li></ul>	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
Farmers	Need to manage water levels for both agriculture and fishery production	Prioritise crop irrigation needs over fisheries	Farmers accept need to modify sluice gate use for multiple benefits		

<b>7. Private sector</b>					
Possible inclusion in project to be explored by BCAS					
Private enterprises involved in extensive stocking (e.g. in Daud Kandi upazilla)	Importance of SRS in culture ponds	To be investigated			
<b>8. Natural resources management and development projects in Bangladesh</b>					
4 <sup>th</sup> Fisheries Project	Guidelines on sanctuary selection and management, SRS and sluice gate operation	Already involved in sanctuary development and integrated management to varying degrees, but limited awareness of FMSP and NRSP outputs	Enhanced awareness of available FMSP guidelines and knowledge on integrated floodplain resource management	<ul style="list-style-type: none"><li>- Provision of bill boards and posters for display in project locations (to be selected project partners); focus on clear simple messages and good artwork / presentation</li><li>- Provision of PowerPoint packages for use in training programmes</li></ul>	BCAS and CNRS will monitor inputs and outcome; IIED, CNRS & BCAS will evaluate.
CBFM Project					
MACH Project					
DFID country desk (re relevance to above projects and e.g. new Char Livelihoods Proj.)					
<b>9. Regional and National Water sector policy makers and managers in South East Asia (India and Mekong regions)</b>					
West Bengal DOF etc	Benefits of harvest reserves, FCDI design and sluice gate operation for fisheries sector and guidelines for integrated management	Stakeholders generally see water management in sub-sectoral terms (i.e. fisheries, irrigation, navigation, etc.). Some awareness of need for reserves (e.g. in Mekong 'deep pools') but low awareness of FMSP and NRSP outputs.	Enhanced awareness amongst water sector planner/managers about integrated floodplain water management	- India workshop in Calcutta for water planners and managers from target institutes, to present Bangladesh policy briefs, training materials, other guidelines etc, as relevant to India	SCALES will organize and lead the regional workshop and monitor follow up in collaboration with Indian and regional partners
National DOFs and research agencies in Indian and Mekong				- Dissemination of project outputs by hard copy	
Regional advisory bodies including Mekong River Commission, WorldFish, STREAM				- Submission of articles to newsletters (e.g. MRC 'Catch and Culture') - Electronic dissemination on web sites (esp. STREAM, WorldFish) or via e-groups	
<b>10. DFID Policy Division &amp; Research Programme</b>					
Target policy groups: Global & Local Environments; MDG; Renewable Natural Resources; Reaching the Very Poorest	Summary knowledge and guidelines arising from FMSP Cluster 9, in the context of wider DFID issues including climate change, poverty reduction, good governance etc	Aware of existence of FMSP knowledge, but could be encouraged to promote more widely through DFID projects, programmes and country offices	Wider knowledge and promotion of FMSP products	- Direct communication, including information briefs prepared around DFID guidelines for policy level audiences.	Direct communications by SCALES and IIED

**Table 1. Summary of communication channels and media intended for different stakeholders**

	Bangladesh								Reg- ional	DFID
Communication channel / media	1. Policy mak-ers	2. Univ/ train-ers	3. Natl. mgrs/ plnrs	4. Distr./ upaz. mgrs/ plnrs	5. Local mgrs	6. FP resrc. users	7. Priv-ate sector	8. NR Proj-ects	9. Policy mkrs. / mgrs.	10. Policy divi-sion
<b>Policy briefs</b> (co-authored where possible by senior ministry staff)										
<b>Policy dialogue</b> with key influential stakeholders in one-to-one meetings and small multi-stakeholder workshops										
Sponsorship of <b>Fish Fortnight seminar</b> with DOF about floodplains management										
Inclusion of key FMSP points in draft ' <b>Parliamentary Policy Paper</b> on Fish Sanctuaries'										
Provision of <b>PowerPoint packages</b> for incorporation into existing training programmes										
Preparation of <b>2-page summaries</b> of FMSP and other Bangladesh projects (also to contribute to FMSP programme level database)										
Development of <b>BCAS and CNRS web sites</b> to provide access to e-docs and directions to hard copy grey literature in library										
Powerpoint presentations at <b>senior managers monthly meetings</b> , with hard copy handouts of management guidelines, leaflets and policy briefs etc										
Articles for BCAS 'Bangladesh Environmental News' <b>newsletter</b> and DOF Fish Fortnight souvenir magazine, also submitted for use by other agencies' newsletters										
<b>Briefings at upazilla monthly meetings</b> in 2-3 locations to be selected by DOF										
Distribution of FMSP guidelines in <b>leaflet</b> form (e.g. based on SUFER formats)										
Distribution of <b>5-10 page managers guidelines</b> in bangla										
<b>Focus groups / training</b> at FMSP sites in Tangail / Pabna, to coincide with start of flood										
<b>Street theatre + pot songs</b> - up to 10 locations/performances at selected sites, during Fish Fortnight, with invitations to TV media to film and distribute nationally										
<b>Newspaper article</b> (based on newsletter material) and promoted to target 'green' newspapers (e.g. 'Bangla Daily')										
Provision of <b>bill boards and posters</b> for display in project locations to be selected by DOF and project partners; focus on clear simple messages with good artwork										
<b>India workshop</b> in Calcutta for water planners/managers, to present Bangladesh policy briefs, training materials, other guidelines etc, as relevant to India										
<b>Postal dissemination of hard copy materials</b> and electronic dissemination on <b>web sites</b> (esp. STREAM, WorldFish) or via e-groups										
<b>Information briefs</b> prepared around DFID guidelines for policy level audiences										

## **Annex 5. India dissemination workshop (Activity 2.2)**

### **Workshop Briefing Note**

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#### **FMSP Project R8486 – Floodplain fishery management guidelines – Dissemination Workshop**

**Host:** West Bengal Department of Fisheries, Kolkata, India

**Venue:** Great Eastern Hotel, Central Kolkata

**Date:** 5-6 August 2005

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#### **Background**

Since 1992, the Fisheries Management Science Programme (FMSP) of the UK Department For International Development (DFID) has produced a series of outputs about the management of inland water fish stocks. These have shown, among other things, that inland fish production could be increased by the careful placement and management of fishery reserves or sanctuaries, and by measures maintaining the natural migration patterns of floodplain river fish stocks. In flood control / irrigation systems, the operation of sluice gates at key times of the year has a critical role in maintaining fisheries as well as providing water for agriculture.

These FMSP projects have developed a strong biological basis for the management of fish stocks in floodplain river systems. The projects of DFID's Natural Resources Systems Programme (NRSP) have also developed 'systems' guidance on the integrated management of floodplain resources, recognising the needs of multiple resource users, especially the poor.

FMSP project R8486 aims to promote the knowledge developed by these FMSP and NRSP projects in Bangladesh and in India, and to provide access to key materials via project websites.

To promote these messages, a range of new communication products were agreed with stakeholders at a project inception workshop, held in May 2005 in Dhaka, Bangladesh. These are now being developed and promoted in Bangladesh using a range of different media and promotion pathways. They include policy briefs; a sponsored seminar and stall during the annual Fish Fortnight; and focus groups; drama and 'pot songs' for sluice gate and fisheries managers at the local level. Reports, leaflets, newsletters and posters are being distributed as hard copy products, and electronically on web sites or via e-groups etc.

#### **This workshop**

This dissemination workshop will present the key messages and information products (both technical and institutional) from selected FMSP floodplain fisheries projects and give summary information on the NRSP and other DFID projects. The outline programme is given below.

Following the presentations, participants will be invited to consider the relevance of the FMSP knowledge to their situation and to provide feedback in discussion sessions. At the end of the workshop we will attempt to identify indicators and processes by which the uptake of the project outputs may be monitored both within and beyond the term of the project. These will include a short 'Knowledge, Attitude and Practice' questionnaire survey that will be given out for completion both at the start and the end of the workshop.

Following the workshop, some of the new outreach materials (guidelines documents, leaflets, PowerPoint presentations) will be made available for download on the FMSP R8486 project web site (see 'current projects' on <http://www.fmsp.org.uk/>).

#### **Logistics**

Local arrangements for this dissemination workshop are being made by the West Bengal Department of Fisheries.

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#### **Sponsor: DFID Fisheries Management Science Programme (FMSP)**

**Contact:** Dr Daniel Hoggarth (dhoggarth@sunbeach.net)

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**Tel:** + 44 207 255 7755 (General Enquiries)

**Websites:** <http://www.mragltd.com/>, <http://www.fmsp.org.uk/>, <http://www.dfid.gov.uk/>

#### **Host: West Bengal Department of Fisheries (WBDOF)**

**Contact:** Dr. Madhumita Mukherjee (madmita\_mukh@yahoo.co.in)

**Address:** Office of the Joint Director of Fisheries (M&P), Pailan, P.O. Pailan Hat, P.S. Bishnupur, Diamond Harbour Road, Kolkata-700104.

**Tel:** 2497 8209, 2323 7614

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## Workshop programme

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### Day 1 – Friday 5 August

09.00 Registration

#### Opening Ceremony

10.00 Welcome ceremony  
10.10 Welcome address Mr Anoop K. Agrawal, I.A.S. Director of Fisheries, WB  
10.20 Introductions and background to the workshop and project Dr Daniel Hoggarth (DH)  
10.30 Keynote address Mr R.P.S. Khalon, Secretary, Dept. of. Fisheries  
10.40 Presidential address Mr Kiranmoy Nanda, Minister in Charge of Fisheries  
10.50 Vote of thanks Dr Madhumita Mukherjee, Jt. Director of Fisheries  
**11.00 Tea / Coffee**

Review of programme and selection of chairperson/s

#### Session 1. Current practice in West Bengal

11.15 Pre-workshop questionnaire survey of participants current 'Knowledge, Attitude and Practice' (KAP) about floodplain fishery management in West Bengal Participants  
11.45 Floodplain Fisheries and their Management in West Bengal Dr Madhumita Mukherjee  
12.15 Discussion of current practices

#### Session 2. Review of DFID floodplain fisheries management knowledge and communication products

12.30 Introduction to DFID floodplains-related projects (FMSP Cluster 9 and others) DH  
See leaflets, web site addresses etc in registration pack  
**13.15 Lunch**

#### Session 3. Floodplain fisheries management guidelines

14.00 Overview of FMSP floodplains guidelines published as FAO Fisheries Technical Paper 384 DH  
Including slide show of floodplain fishing gears, impacts etc DH  
15.00 Review of summary Managers Guidelines (5-pager) Dr Ashley Halls (AH)  
**15.15 Tea / Coffee**

#### Session 4. Harvest reserves – selection and co-management (project R7043)

15.45 Key messages presentation (including research on reserve impacts) DH  
16.15 Training presentation DH  
17.00 Discussion  
**17.30 Close**

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### Day 2 – Saturday 6 August

#### Session 5. Invited presentations on floodplain related management from Indian experts

10.00 Dr. Maniranjana Sinha, Fisheries Advisor, Government of Tripura  
10.15 Dr. Vass, Director, CIFRI, Barrackpore, Kolkatta  
10.30 Dr. Ayar, Previous Director, CIFRI, Barrackpore, Kolkatta  
10.45 Discussion

#### Session 6. Management of sluice gates for FCDI mitigation (Projects R5953 and R8210)

11.00 Fisheries impact of the Pabna FCDI scheme in Bangladesh (R5953 etc studies) AH  
11.15 Key messages on sluice gate management (R8210 results and recommendations) AH  
11.45 Discussion  
**12.00 Tea / Coffee**

#### Session 7. Other FMSP floodplains-related research outputs

12.20 Floodplain fisheries modeling approaches AH+DH  
Including area-based predictive models (projects R5030, R7834); population dynamics models including hydrology (R5953, R7868); and multi-species, multi-gear modeling (R4791)

- 13.00 Data collection for co-management of inland river fisheries (project R8285) AH  
 13.15 Discussion of other research outputs  
 13.30 *Lunch*

#### Session 8. Floodplain fisheries management in Bangladesh

- 14.30 Presentation of draft Bangladesh Open-water Capture Fisheries Strategy Masood Siddique (BDOF)  
 15.00 Discussion of Bangladesh strategy  
 15.15 *Tea / Coffee*

#### Session 9. Workshop conclusions follow up

- 15.45 Planning for project monitoring and evaluation (M&E) DH  
 Leading to agreement on collection of any data for monitoring uptake  
 16.15 Final comments and recommendations by Indian experts  
 (A) Dr. Sugata Hazra, Director, School of Oceanographic Studies, Jadavpur University, Kolkata  
 (B) Dr P. Das, Retired Director, National Bureau of Fish Genetic Resources, Lucknow, ICAR  
 16.45 Post-training KA survey (pre-and post- results to be analysed to show any change in knowledge or attitude due to the workshop; actual practices to be monitored as agreed above Participants  
 17.15 Workshop evaluation and concluding remarks by the chair and others Chair / DH etc  
 17.30 *Workshop close*

## **List of Participants**

### Inaugural Programme

1. Sri Kironmoy Nanda, Minister in charge, Department of Fisheries, Aquaculture, Aquatic Resources and Fishing Harbour, Govt. of West Bengal, Writers' Buildings Kolkata – 700 001, West Bengal.
2. Raj Pal Singh Kahlon IAS, Secretary, Fisheries Department, Govt. of West Bengal, Writers' Buildings Kolkata – 700 001, West Bengal.
3. Mr Anoop K. Agrawal, IAS, Director of Fisheries, West Bengal.

### Organizers

1. Dr. Daniel D. Hoggarth, SCALES Inc., C3/12 Graeme Hall Park, Christ Church, Barbados
2. Dr. Madhumita Mukherjee, West Bengal Department of Fisheries (Collaborator - Project R8486)
3. Dr. Ashley Halls, Aquae Sulis Ltd. Bath, UK

### Special Guests

1. Masood Siddique, Bangladesh Department of Fisheries / Fourth Fisheries Project, Dhaka
2. Dr. Maniranjana Sinha, Advisor to the Govt. of Tripura, Department of Fisheries, Agartala (and Ex-Director, CIFRI) – 799 006
3. Mr. V. R. Chitranshi, Assistant Director General (Fisheries), DF, ICAR, Krishi Anusandhan Bhawan Bhawan- II, New Delhi.
4. Mr. S. P. Ayyar, Retd. Director of CIFRI, C-205, Usha's Apartment, 16 Main, 4<sup>th</sup> Block, Jayanagar, Bangalore 560001.
5. Mr. Y. S. Yadava, I.G.O. Coordinator, B.O.B.P. 91 St. Marys Road, Abhirampuram, P.B. No. 1054, Chennai 600018.
6. Dr. P. Das, Retired Director, National Bureau of Fish Genetic Resources, Lucknow, ICAR, Govt. of India

### Participants

1. Dr. Vyas. Director, CICFRI Barrackpur.
2. Dr. Aniruddha Mukherjee, Environmental Department, Calcutta University.
3. Dr. Sugata Hazra, Director, School of Oceanographic Studies, Jadavpur University, Kolkata – 700 032.
4. Director, IIM, JOKA, Kolkata.
5. R. Chakraborty, Director, River Research Institute, Kolkata 700 087
6. Mr. S. Chakraborty, Joint Director of Fisheries (ME & MS).
7. District Magistrate, Nadia.
8. District Magistrate, North 24 Pgs.
9. Sri Gautam Sarkar, Dy. Director of Fisheries, (Central Zone).
10. Karmadhakshya, Irrigation Department, Nadia.
11. Karmadhakshya, Fisheries Department, Nadia.

12. Executive Engineer, Irrigation Department, Nadia.
13. Executive Engineer, Zilla Parishad, Nadia.
14. Principal Agriculture officer, Nadia.
15. Barun Mukherjee, Karmadhakshya, Irrigation Department, North 24- Pgs.
16. Karmadhakshya, Fisheries Department, North 24- Pgs.
17. Executive Engineer, Irrigation Department, North 24- Pgs.
18. Executive Engineer, Zilla Parishad, North 24- Pgs.
19. J. Chatterjee, Principal Agriculture officer, North 24- Pgs.
20. Assistant Director of Fisheries, Nadia.
21. Dr. S. Das, Assistant Director of Fisheries, North 24- Pgs.
22. Dr. Sailendra Nath Biswas, Deputy Director of Fisheries (Freshwater Aquaculture & Research), Govt. of West Bengal, Freshwater Fisheries Research Station, Kulia (Kalyani), Nadia District.
23. Sri Atish Ghosh, Steno to the Director of Fisheries, West Bengal.
24. Saynatani Raychoudhuri, i-land informatics Ltd, NGO.
- 25-27. Three Journalists.

## Impacts on Knowledge and Attitude

Impacts of the India dissemination workshop on 'knowledge' and 'attitude' towards the FMSP recommendations was tested using parts 1 and 2 of the KAP survey questionnaire (see below).

Fishery management 'practices' in West Bengal were not recorded in the survey as it was not expected that such practices would change between the times of the pre- and post-workshop questionnaires. In India's West Bengal state, inland water resources, like Bangladesh, are already highly modified by flood control, drainage and irrigation projects. Due to the high level of impoundment, management has focussed on the establishment of fishermen's co-operatives and attempts to increase fish production by stocking of carps in sewage-fertilised impoundments. FMSP floodplains-related knowledge is currently little used, but relevant to this resource, as in Bangladesh.

Results from the questionnaire surveys, taken both at the start and end of the dissemination workshop are given in Tables A5.1 and A5.2 below for knowledge-related and attitude-related questions respectively. Since some participants did not attend the full two days of the workshop, and some others declined to complete the questionnaire at the end of the workshop, the numbers of post-workshop respondents is only half the number of pre-workshop ones.

In the two tables, the themes (harvest reserves, sluice gates etc) given in the second column indicate those questions specifically relating to a particular theme, where a particular 'right' answer was being tested (see below for the full text of the questions in the questionnaire). Questions were sometimes framed so that the 'right' answer required a positive response; others required a negative one (see shading in the main block of responses indicating the 'right' answer in each case). The 'difference' column in the tables gives the absolute difference between the mean value given by the respondents and the 'right' answer for that question. This ranges in principle between 0 if all respondents give the 'right' answer, up to say 4 if the right answer is '5' (e.g. 'strongly disagree') but all respondents answer with a 1 (e.g. 'strongly agree'). The values in the bottom right give the change in these 'difference' values between the pre- and post-workshop surveys. Where this value is negative (as shown by shading in the table), this means that the respondents have on average moved towards the 'right' answer for that question. In these cases, the training may be said to have been successful in developing knowledge or changing attitudes.

It will be noted that some questions are not shaded to indicate any 'right' answer, or given any theme. These questions were not included in the quantitative analysis, as with hindsight, they were considered too difficult to allocate clear 'right' answers. In most of these cases, the answer would depend on the particular local circumstances, or the objective of management. With hindsight, some of these questions could perhaps have been removed from the questionnaire if time had been allocated to pre-testing etc.

Looking at the results, it is clear that the training has increased the respondent's knowledge of the

FMSP results, and changed attitudes towards the recommended approaches. The bottom right blocks of cells are mostly shaded, indicating reductions in the 'difference' scores between the pre- and post-workshop surveys. For the post-workshop surveys, nearly all of the modal responses were on the 'right' side of the distribution, if not necessarily on the 'strong' answer defined as 'right'.

The largest of the few non-negative changes in difference scores (for Question 5 in the attitude survey) related to the self-recruiting species (SRS) results. These results were not a major focus of the training, due to the controversy over the recommendations in preparing ponds).

**Table A5.1 Frequency of responses to the knowledge related questions/statements in the pre- and post-training KAP surveys conducted at the India workshop (see below for the full questionnaire text). Sample sizes: n = 20 pre-workshop, and n=9 post-workshop.**

Pre-workshop responses								
Q	Theme	Questions/statements (shortened version)	Not at all (1)	Low (2)	Medium (3)	High (4)	Very High (5)	Difference (mean - 'correct')
1	HR	Benefit of harvest reserves	0	0	7	<b>9</b>	4	1.2
2a	SL	Benefit of opening sluice gates during flood	2	4	4	<b>6</b>	4	1.7
2b	SL	Benefit of closing sluice gate in dry season	0	0	2	<b>10</b>	8	0.7
3	SR	Importance of SRS in diet of poor	0	3	4	6	<b>7</b>	1.2
4	SL	Benefit of diversifying crops in beel areas	0	1	<b>6</b>	<b>6</b>	<b>6</b>	1.1
5a		Benefit of monsoon/high water closed season	1	0	4	8	7	
5b		Benefit of dry season closed season	2	9	4	4	1	
			Correct (1)		No Idea (2)		Incorrect (3)	
6	M	Less than 10% of fish survive each year in B'desh	<b>3</b>		<b>8</b>		<b>8</b>	1.3
7	M	Benefit of dry season closed season	<b>10</b>		1		9	1.0
8		Benefit of closed season (any month)	11		2		7	
9	HR	Importance of blackfish/whitefish issues	<b>11</b>		5		<b>3</b>	1.4
10	HR	Importance of sanctuary locations	<b>14</b>		4		2	0.4

Post-workshop responses								
Change in 'difference' scores since first pre-workshop survey								
1	HR	Benefit of harvest reserves	0	0	0	<b>6</b>	4	0.6 -0.6
2a	SL	Benefit of opening sluice gates during flood	0	0	2	<b>7</b>	1	1.1 -0.6
2b	SL	Benefit of closing sluice gate in dry season	0	0	0	4	<b>6</b>	0.4 -0.3
3	SR	Importance of SRS in diet of poor	0	0	4	1	<b>5</b>	0.9 -0.3
4	SL	Benefit of diversifying crops in beel areas	0	1	<b>3</b>	<b>3</b>	<b>3</b>	1.2 0.1
5a		Benefit of monsoon/high water closed season	0	1	3	3	1	
5b		Benefit of dry season closed season	1	0	3	1	4	
6	M	Less than 10% of fish survive each year in B'desh	<b>4</b>		2		<b>4</b>	1.0 -0.3
7	M	Benefit of dry season closed season	<b>8</b>		0		2	0.4 -0.6
8		Benefit of closed season (any month)	6		1		3	
9	HR	Importance of blackfish/whitefish issues	3		1		<b>6</b>	0.7 -0.7
10	HR	Importance of sanctuary locations	<b>5</b>		1		3	0.8 0.4

**Notes:**

Themes: HR = Harvest reserves; M = Management (generally); SL = Sluice gates; SR = Self-recruiting species

Themes given in the second column indicate questions specifically relating to a particular theme, where a particular 'right' answer was being tested

Shading in the main block of responses indicates the 'right' answer to each question, where appropriate

Shading in the bottom right block of cells indicates those questions where the 'difference' between the mean answer of the respondents and the 'right' answer had decreased between the two surveys.

Bold numbers give the most frequently given (modal) response for each question.

Coding of answers for questions 6-10 changed for the analysis to recode the 'no idea' answer to use the middle value, 2, and the 'incorrect' answer to the value 3.

**Table A5.2** Frequency of responses to the attitude related questions/statements in the pre- and post-training KAP surveys conducted at the India workshop (see below for the full questionnaire text). Sample sizes: n = 20 pre-workshop, and n=9 post-workshop, not including single Bangladeshi respondent.

**Pre-workshop responses**

Q	Theme	Questions/statements (shortened version)	Strongly agree (1)	Agree (2)	Not sure (3)	Disagree (4)	Strongly disagree (5)	Difference (mean - 'correct')
1	M	Aquaculture more important than fishery management	6	5	2	5	1	2.5
2		Fishing effort control could increase yields	10	9	0	0	0	
3		Increase in rice production more important than fishery	4	1	3	8	3	
4		Pond aquaculture can be alternative of capture fishery	1	9	5	4	1	
5	SR	Removal of SRS by pesticides should be discouraged	10	4	2	1	1	0.8
6	SL	Open sluice gates in flood will not benefit fish	3	4	5	7	0	2.2
7	SL	Sluice gates can only be used to protect crops	2	4	1	9	4	1.6
8		3 month closure in dry season better than in flood	0	9	2	7	0	
9	SL	Frequent short opening of sluice gates better...	1	13	5	1	0	1.3
10	HR	Beels best location for white fish reserves	3	13	0	3	0	2.8
11		Intensive fish stocking best option to increase prod'n	3	9	3	3	0	
12	SR	Govt. should make legal framework for SRS	7	12	0	1	0	0.8
13	M	Poor should not be involved in floodplain management	2	4	2	5	7	1.5
14		Data/information sharing would ... hamper main work	1	3	1	13	2	
15	HR	One large reserve better than several small ones	2	7	4	6	0	2.3
16	SL	Sluice gate managers should only open/close gates	2	7	3	7	1	2.1
17	SL	Not possible to diversify rabi crops in beel basins...	2	5	3	7	2	1.9
18		Biodiversity and poverty higher priority than total catch	8	8	0	2	1	
19	HR	Community-led management better than strict govt...	7	12	0	0	0	0.6
20	HR	Sanctuary need strict rules, so co-manage't no good	0	9	1	6	2	1.9
21	M	Wetlands less important than crop lands	3	2	1	5	8	1.3
22	HR	Whitefish sanctuary more important than blackfish...	0	7	7	5	0	2.1
23	HR	No fishing should ever be allowed in sanctuary	2	13	0	3	2	2.5
24	HR	Sanctuary manage't plan must be centrally developed	2	11	2	3	1	2.5
25	M	Catchment-wide management best approach...	4	14	0	0	0	0.8

**Post-workshop responses**

Change in 'difference' scores since pre-workshop survey								
1	M	Aquaculture more important than fishery management	2	3	0	4	0	2.3
2		Fishing effort control could increase yields	2	6	1	0	0	

3		Increase in rice production more important than fishery	0	1	1	5	2		
4		Pond aquaculture can be alternative of capture fishery	1	0	0	7	1		
5	SR	Removal of SRS by pesticides should be discouraged	2	5	0	1	1	1.3	0.5
6	SL	Open sluice gates in flood will not benefit fish	0	6	0	2	1	2.2	0.1
7	SL	Sluice gates can only be used to protect crops	0	1	0	4	3	0.9	-0.7
8		3 month closure in dry season better than in flood	1	3	0	3	2		
9	SL	Frequent short opening of sluice gates better...	1	7	0	1	0	1.1	-0.2
10	HR	Beels best location for white fish reserves	3	4	2	0	0	3.1	0.3
11		Intensive fish stocking best option to increase prod'n	2	3	0	4	0		
12	SR	Govt. should make legal framework for SRS	4	5	0	0	0	0.6	-0.2
13	M	Poor should not be involved in floodplain management	1	0	0	5	3	1.0	-0.5
14		Data/information sharing would ... hamper main work	1	0	0	7	1		
15	HR	One large reserve better than several small ones	0	3	0	5	1	1.6	-0.7
16	SL	Sluice gate managers should only open/close gates	0	2	0	7	0	1.4	-0.7
17	SL	Not possible to diversify rabi crops in beel basins...	0	0	1	8	0	1.1	-0.8
18		Biodiversity and poverty higher priority than total catch	2	2	0	2	1		
19	HR	Community-led management better than strict govt...	4	4	0	1	0	0.8	0.1
20	HR	Sanctuary need strict rules, so co-manage't no good	0	3	0	5	1	1.6	-0.4
21	M	Wetlands less important than crop lands	0	0	0	6	3	0.7	-0.6
22	HR	Whitefish sanctuary more important than blackfish...	0	0	3	5	0	1.4	-0.7
23	HR	No fishing should ever be allowed in sanctuary	1	2	0	5	1	1.7	-0.8
24	HR	Sanctuary manage't plan must be centrally developed	0	6	0	2	1	2.2	-0.3
25	M	Catchment-wide management best approach...	1	7	1	0	0	1.0	0.2

#### Notes:

Themes:HR = Harvest reserves; M = Management (generally); SL = Sluice gates; SR = Self-recruiting species

Themes in the second column indicate questions specifically relating to a particular theme, where a particular 'right' answer was being tested

Shading in the main block of responses indicates the 'right' answer to each question, where appropriate

Shading in the bottom right block of cells indicates those questions where the 'difference' between the mean answer of the respondents and the 'right' answer had decreased between the two surveys.

Bold numbers give the most frequently given (modal) response for each question.



**KAP (Knowledge, Attitude and Practice) survey on FMSP  
FMSP Project R8486**

**Respondent:**

Name of the enumerator: \_\_\_\_\_ Date: \_\_\_\_\_

Name of the respondent: \_\_\_\_\_ Designation: \_\_\_\_\_ Organization: \_\_\_\_\_

Education: \_\_\_\_\_ Work Station: \_\_\_\_\_ Work Experience: \_\_\_\_\_

\_\_\_\_\_

**1. Current knowledge of stakeholders on improved floodplain fisheries/resources management issues and options**

Please answer the questions in this section using the following scale:

If you wish to clarify your answer, please add text to the lines underneath (insert more lines if required). However, please always use the scale to insert a number in to the box.

1 = Not at all  
2 = Low  
3 = Medium  
4 = High  
5 = Very High

1. In your understanding, to what extent can fish sanctuaries/reserves produce floodplain fisheries benefit?  
(on the scale of 1-5)

2. In your understanding, to what extent would there be fisheries benefit within FCD/I schemes if the:

- sluice gates are open during rising flood water? (on the scale of 1-5)
- some water is retained inside the FCD/I scheme over the dry season by closing sluice gates (before the end of the ebb flow) ? (on the scale of 1-5)

3. To what extent do SRS (self recruiting species) like puti, chanda, small shrimp, etc. contribute to the diet and income of poor households? (on the scale of 1-5)

4. To what extent could diversification of alternative rabi crop (other than boro rice) in beel areas benefit floodplain fisheries production? (on the scale of 1-5)

5. To what extent the Impact would be on fisheries production if closed period is maintained:

- in monsoon / high water season (June-August)? *(on the scale of 1-5)*
- in pre-monsoon / dry season (February-April)? *(on the scale of 1-5)*

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Please answer the questions in this section using the following scale:

If you wish to clarify your answer, please add text to the lines underneath (insert more lines if required). However, please always use the scale to insert a number in to the box.

1 = Correct  
2 = Incorrect  
3 = No idea

6. In Bangladesh there is so much fishing that less than 10% of fish survive each year *(on the scale of 1-3)*

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7. Fish production could be substantially increased by restricting fishing particularly during the dry season (January-April). *(on the scale of 1-3)*

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8. Closed season during any month of the year would increase fish production a little (say less than 5%) *(on the scale of 1-3)*

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9. It is not important to consider whitefish or blackfish issue in establishing floodplain fish sanctuary (reserve) as there would be no differences in benefit. *(on the scale of 1-3)*

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10. Selection of sanctuary site must consider the locations where extra fish produced due to the reserve will be caught by the people. *(on the scale of 1-3)*

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**2. Attitude Related: Please express your opinion by putting tick (✓) in any of the 5 options against each statement**

Statements	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
1. We should emphasize and promote increased aquaculture production as opposed to put much effort in floodplain fisheries management					
2. Fishing effort control could contribute in increased fishery yield					
3. Considering the high population, we need to increase rice production at the cost of floodplain capture fisheries					
4. Pond aquaculture can be the alternative of open water (floodplain) fisheries					
5. Removal of self recruiting / wild species (SRS) using pesticides during pond preparation should be discouraged					
6. Keeping sluice gates open during rising flood water will not benefit fish as high current and turbulence would restrict fish movement					
7. Sluice gates can not be operated for the benefit of fish as these are built for crop protection only					
8. Three months closed season in pre-monsoon (February - April) would produce better results than 3 months closure in monsoon (June-August)					
9. Frequent opening of gates (even for short period) in rising water stage may benefit the fishery more than continuous longer opening in other times					
10. Beels could be the best location for making sanctuary for migratory species (white fish)					
11. Intensive fish stocking in floodplain beels can be the best option for increased fish production					
12. Government should formulate a legal framework for SRS conservation and management					
13. Poor has no land and thus they should not be involved in floodplain fisheries management planning and implementation					
14. Data/information sharing among relevant stakeholders/institutions would increase paper that would hamper main work					
15. Establishment of one large beel as sanctuary is better than several small reserves in a wider catchment					
16. Gate managers scope of work should be limited to opening and closing gates only					
17. It is not possible to diversify rabi crops (other than boro rice) in beel basins – as beels are only suitable for boro cropping					
18. In floodplain management environment, biodiversity and poor peoples livelihood should be given priority instead of production increase					
19. Community-led flexible management of sanctuary can produce better results/benefit than strict government managed closed ones					
20. Sanctuary need strict rules thus collaborative co-management approach would not work for sanctuary management					
21. Wetlands are less important (Waste lands) than crop lands					
22. White fish sanctuary could produce wider benefits than black fish reserve – we should promote only white fish sanctuary to get wider benefit					
23. All sanctuaries should be managed strictly and there should be no fishing year round					
24. Sanctuary management plan must be developed centrally by the concerned authority with strict rules and conditions					
25. Catchment wise integrated floodplain management can be the best approach as opposed to single water-body management					

## Local follow up by collaborators

The letters pasted below were received from the Indian project collaborators on 2 December 2005, describing the actions they had taken since the workshop at that time.

**GOVERNMENT OF WEST BENGAL  
DIRECTORATE OF FISHERIES  
JESSOP BUILDING  
63, N. S. ROAD, KOLKATA-700001.**

**No. FTR- 323  
FTR-1/18/97-II**

**Date 2 / 12 / 2005.**

To  
Dr. Daniel Hoggarth,  
Scales Consulting Ltd.,  
66B, Creffield Road,  
London W3 9PS,  
UK.

Sub: Feedback on the uptake and adoption on the collaborative  
Project on FMSP tools.

Ref: Your e-mail on November 28<sup>th</sup> 2005

Sir,

With reference to your e-mail dated November 28<sup>th</sup> 2005 we are to furnish our comments on the basis of the points raised in bullet points.

<b>Sl No.</b>	<b><u>Query</u></b>	<b><u>Action Taken</u></b>
1	Any further training of staff within the department (if so, when?, where?, to how many participants?, summary of training messages or materials)	Training on flood plain management and stock assessment tools is regularly being imparted from State Level Training Centre at Kalyani, Nadia. 40 nos of WBJFS – Grade II officers in 2 sets of trainings on basic data collection have been completed during October & November 2005 utilizing GOI funds.
2	Any writing of papers, newsletters, policy recommendations referring to the FMSP guidelines (either directly or indirectly – e.g. recommendations for more sanctuaries, but without mentioning the FMSP guidelines)	Manuscript on ‘Area Report on West Bengal’ comprising of 50 pages and 20 photographic plates has been completed and we are awaiting funds for publication. Preparation of leaflets and exhibition posters for awareness campaigning is in progress.
3	Any promotion of the messages within field sites (e.g. promotion of sanctuaries/slulice gate managements/alternative cropping by NGO Collaborators) – if so, in which locations?, when?, by whom (NGO name)?, and potentially affecting how many stakeholders (numbers in any specific categories?)	<ol style="list-style-type: none"><li>1. A meeting between Ministers of West Bengal and Bangladesh Fisheries has been written to and negotiations are expected to fall in place (<a href="#">see second letter below</a>).</li><li>2. Two meetings in Nadia and 24 Parganas (North) have been called to constitute sluice gate committees for each of the gate which were deferred by the District Magistrates, likely to be activated soon.</li><li>3. Sluice Gates and Sanctuaries is in our policy level decisions and are likely to be framed by 2006.</li><li>4. Data is being filtered into an Agri Portal which will serve up to the Block Levels in local language also.</li><li>5. Agricultural Biodiversity Committee the JDF (HQ) has been selected to be one of the board members responsible to tract down the following:<ol style="list-style-type: none"><li>a. Formulate strategies for Agricultural Biodiversity inventorization.</li><li>b. Keep the board informed about present status of</li></ol></li></ol>

		<p>Agricultural Biodiversity of W.B.</p> <ul style="list-style-type: none"> <li>c. Suggest germplasm conservation strategies.</li> <li>d. Promoting traditional cultivable bio resources.</li> <li>e. Identification of Agricultural Biodiversity.</li> <li>f. Introduce economically viable eco-friendly methods of cultivation.</li> </ul>
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A list of participants is attached along with the copies of each bill – expenditure incurred for finalization of accounts.

Yours faithfully,

**Director of Fisheries**  
West Bengal

Copy forwarded for information to:

1. P.A. to the Minister-in-Charge, Department of Fisheries, West Bengal for appraisal.
2. Mr. G.D. Chandrapal, Deputy Commissioner (Fisheries), Govt. of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi – 110 001.
3. The Secretary, Fisheries Department.

**GOVERNMENT OF WEST BENGAL  
DIRECTORATE OF FISHERIES  
JESSOP BUILDING  
63, N.S. ROAD, KOLKATA –1**

**Memo No:FTR 295**

**Dated: 26/10/2005**

1/18/97(II)

To  
The Secretary,  
Department of Fisheries  
Writer's Buildings  
Kolkata – 1

**Sub: Organizing of periodical meetings between the Ministers-in-Charge of the two countries of Bangladesh and West Bengal, Department of Fisheries.**

Sir,

The Department of Fisheries, West Bengal, has successfully completed the **FMSP Project R8486 – Floodplain fishery management guidelines – Dissemination Workshop at Great Eastern Hotel, Central Kolkata on 5-6 August 2005**. It was represented by Massood Siddique, Bangladesh Department of Fisheries / Fourth Fisheries Project, Dhaka on behalf of your Government as special guest.

It has been felt that organizing of periodical meetings between the Ministers-in-Charge of the two countries of Bangladesh and West Bengal, India Department of Fisheries would be beneficial for both the land masses and its people. The border districts of our state are ecologically connected with Bangladesh and would be much benefited if joint management of flood plains is performed. Also there would be an erupting need of a discussion on effluent discharge into the Ichamati River along with migratory and other species particularly Hilsa species. It is very disturbing to note that the recent market trends of Hilsa species shows that the size of catches are diminishing (even below 60 gms). This implies that recruitment of new generations would be difficult due to lack of natural brooders. A foolproof quarantine would help to check unwanted disease needs to be looked into. An exchange of technical knowledge base can eventually benefit each other. It would be fruit bearing on excavation of beels for restoration of natural cycle and riverine eco-system. It would enhance production, generate employment and resources. Besides the two sides are optimistically looking forward towards equal mindedness in handling pollution threatening to go out of control because of the huge population pressure.

I am therefore to request you to consider opening a dialogue between the Minister-in-Charge, Bangladesh Department of Fisheries and our Department as to how a joint meeting could be organized on the above subject at the convenience of both the Departments.

Yours faithfully,

-sd-  
**Director of Fisheries**  
West Bengal

Copy forwarded for information to:

1. P.A. to the Minister-in-Charge, Department of Fisheries, West Bengal.
2. Mr. G.D. Chandrapal, Deputy Commissioner (Fisheries), Govt. of India, Ministry of Agriculture, Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi – 110 001.
3. Massood Siddique, Bangladesh Department of Fisheries / Fourth Fisheries Project, Dhaka



## **Annex 6. Bangladesh Knowledge, Attitude and Practices (KAP) Report**

By M. Mokhlesur Rahman and M. Anisul Islam  
Center for Natural Resources Study (CNRS)

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### **1. Introduction**

#### **1.1 Background**

The FMSP floodplain fisheries project cluster has produced a considerable amount of new knowledge concerning such production issues on floodplains. The project intended to communicate the key messages generated out of the findings of various FMSP research projects carried out in Bangladesh and adjacent Asian countries to the key audiences of Bangladesh at government and NGOs levels. The key target institutions of this communication project included the relevant government agencies, (DoF, DAE, BWDB and LGED) and NGOs who are involved in implementing various floodplain fisheries projects in partnership with the DoF.

This project emphasized communication of messages on fish friendly sluice gate management to benefit the impacted fisheries inside modified floodplains (viz. within FCD/I projects), fishing effort control measures, fish sanctuary or reserve management and conservation of SRS for adoption (uptake) by the TIs to enhancing fisheries production and benefiting the livelihood of poor fishers. To this end, clear understanding of communities' current knowledge of, and responses to, the options was considered important for developing the approaches.

This annex reports an effort to determine the knowledge, attitudes and practices (KAP) of relevant stakeholders among TIs on management of floodplain resources. The study addressed the issues relevant to the knowledge, attitudes, and practices of the concerned stakeholders on management issues and understanding of concepts and science in relation to practicing and promoting messages among the TIs at the policy and intermediary levels.

#### **1.2 Objective**

The objective of the survey was to assess the change of understanding and attitude of key actors among the TIs due to communicating new knowledge on floodplain fisheries management.

The study is expected to provide valuable relevant information on the following key areas needed promotion of messages:

- Current knowledge/understanding, attitudes and practices (KAP) of target institutions towards floodplains in relation to policy and practice;
- Perceptions and attitude of stakeholders on issues related to recommended new knowledge (fishing effort control, sluice gate management, conservation of SRS, fish sanctuary/reserve management) and to the extent suitable for adoption;

### **2. Survey Methodology**

The KAP survey targeted key staff of TIs from government agencies and NGOs involved in floodplain fisheries management and policy development. The TIs in government included DoF, DAE, BWDB and LGED while BRAC, Proshika, Caritas and BELA from NGOs. The study also targeted BARC, MACH, and international organizations like IUCN, Practical Action (former ITDG) and WFC. A comprehensive questionnaire was developed and field-tested before the actual survey was conducted. The survey was conducted twice using the same questionnaire with minor change at the post survey. The first round survey was done at the outset of the project in July 2005 and the second round was done in November 2005.

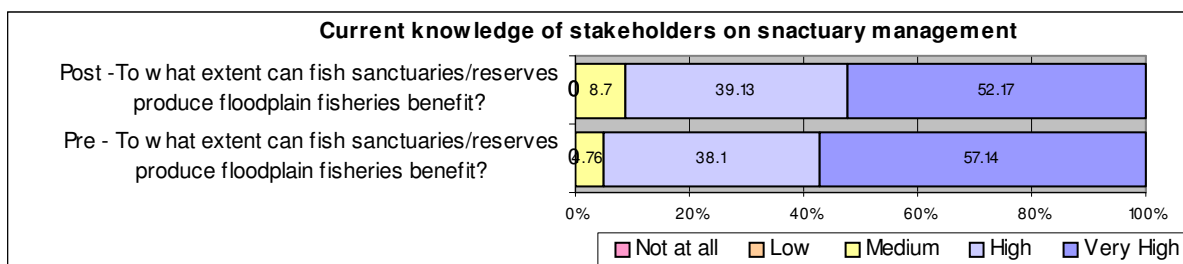
### 3. Findings

#### 3.1 Knowledge of stakeholders on fisheries issues

To assess the current knowledge base of relevant fisheries stakeholders on various floodplain fisheries issues, a questionnaire survey was administered comprising of some relevant statements and the stakeholders asked to express their opinion on five-point scale (not all, low, medium, high and very high) against each of the statements. In addition, another set of statements were made in the survey and the respondents asked to mark each of the statements 'correct', 'incorrect', or 'not sure' based on their knowledge.

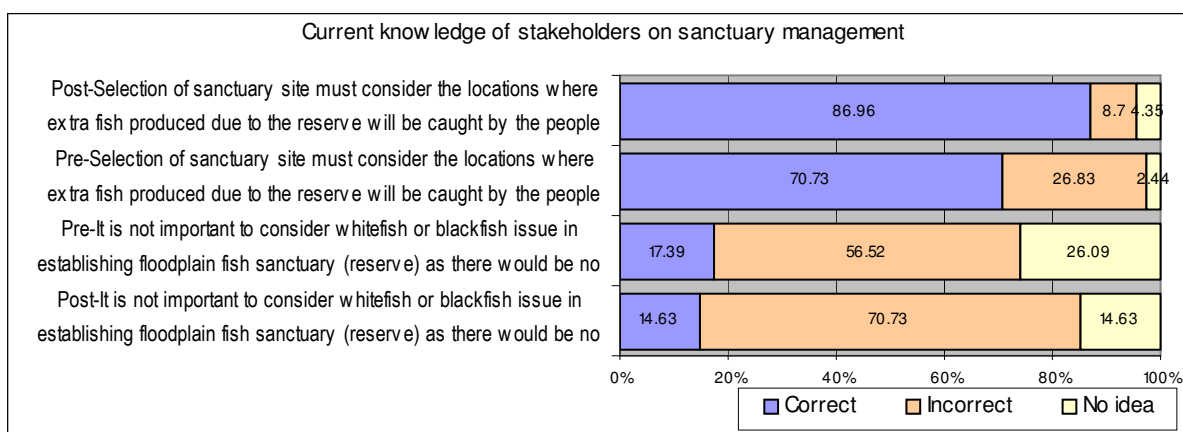
##### 3.1.1 Fish sanctuary

The knowledge of stakeholders on establishing fish sanctuaries was found to be satisfactory. The respondents were asked to express their opinion as to what extent fish sanctuaries could contribute to increasing natural fisheries production in floodplains. Figure 1 shows that all the respondents thought that sanctuaries positively contributed to increase fish production. It was observed that in both the pre and post survey rounds over 50% of the respondents said the benefit of sanctuary is very high and none said there is no benefit or low benefit. Thus, the majority of the respondents currently have an understanding' about the benefit of establishing fish sanctuaries towards enhanced floodplain fisheries production.



**Figure 1: Knowledge on fish sanctuary**

The respondents were asked whether the benefits of increased fish availability due to the establishment of sanctuary should be enjoyed by the local people, and thus whether, while planning fishing places at a reasonable distance from the sanctuary, an area should be set aside where local people could fish for their needs. Most of the respondents said yes, by ticking the correct column. In post survey round, higher numbers of respondents supported this attribute (Figure 2). However, some respondents still opposed the idea and said it was incorrect. The fact remains that the local people must reap some benefits from sanctuaries, maintaining rules of conservation; other-wise, it wouldn't be feasible / acceptable to communities for whom sanctuaries are established.



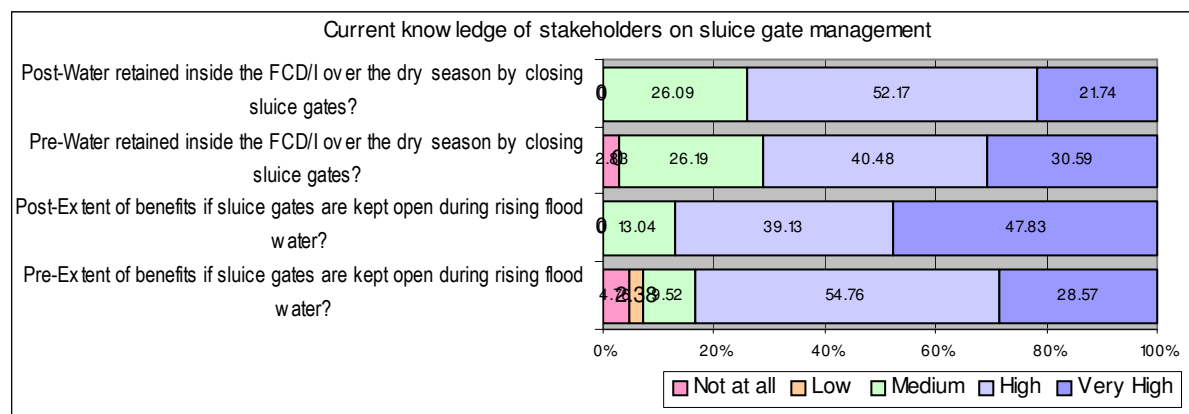
**Figure 2: Knowledge on sanctuary issues**

Another aspect of establishing sanctuaries is to consider the species mix in the riverine floodplain ecosystem and their habitat preference. For example, there are riverine species (so called “white fish” that preferred to spend most their cycle in a riverine environment) and beel resident species (black fish who prefer to spend most of their life cycle in a beel environment). Both the species categories are floodplain dependent, and thus considered riverine floodplain species, and both the categories need a refuge area for growth to attain maturity. A negative statement was served, saying ‘it is not wise to consider “white fish” and “black fish” issues while planning sanctuaries’, and respondents asked to express their opinion as to whether the statement was correct or incorrect (or no idea). The majority of the respondents (70% in post survey compared to 57% in pre-survey) demonstrated understanding’ by stating that the statement was incorrect (Figure 2).

### 3.1.2 Sluice gate management

Studies revealed that FCD/I projects have negatively impacted floodplain fisheries production within flood control projects largely by blocking fish migration (immigration) from river to floodplain beel, and reducing water extent through controlled water regimes. Recent studies (sluice gate management) suggest that there is great potential for increasing fisheries production in flood control projects, through proper, fish friendly, management of sluice gates. To this end, the timing of opening and closing gates is important, and should be adjusted with fish biology as well as with the cropping situation.

From the fisheries point of view, various studies suggested that fisheries gains can be very high if the gates are open when the water level rises in the pre-monsoon (or early monsoon), to facilitate fish immigration. Fisheries gains can also be obtained if the gates are closed during the post monsoon, to retain water inside the flood control project to allow fish to grow for a longer time. The respondents were asked to express their knowledge as to the extent the fisheries gains if the gates are kept open during rising floodwater. The survey findings revealed that at least some of the respondents did not have clear knowledge on the issue but majority demonstrated good knowledge even better at post survey compared to pre survey round (Figure 3).

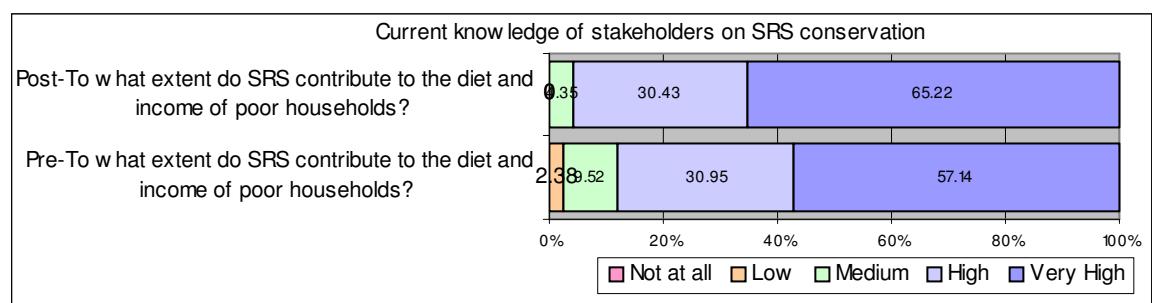


**Figure 3: Knowledge on sluice gate management**

### 3.1.3 Conservation of SRS

SRS (self recruiting species) are the small indigenous fish species found in open and closed waters that can breed and repopulate both in open and impounded water-bodies, and are the main source of protein for the poor households in Bangladesh. These species are however, under serious threat of eradication, due to poisoning or dewatering from closed water aquaculture, over fishing, and habitat reduction in open waters, thus affecting the nutrition and income of poor households. Policy planners often ignore the importance of these species and thus suggest massive aquaculture and large scale stocking of floodplains with carp. However, various studies suggest the need for conservation of these species both in aquaculture, and open water management practices. To this end, it was felt important to get the opinion of stakeholders on the conservation needs of these species and they were asked to express their opinion as to the extent to which SRS contributing to financial and

nutritional income of the poor people. The majority of responded were found to have an understanding of the importance of SRS as observed in both the survey rounds (Figure 4).

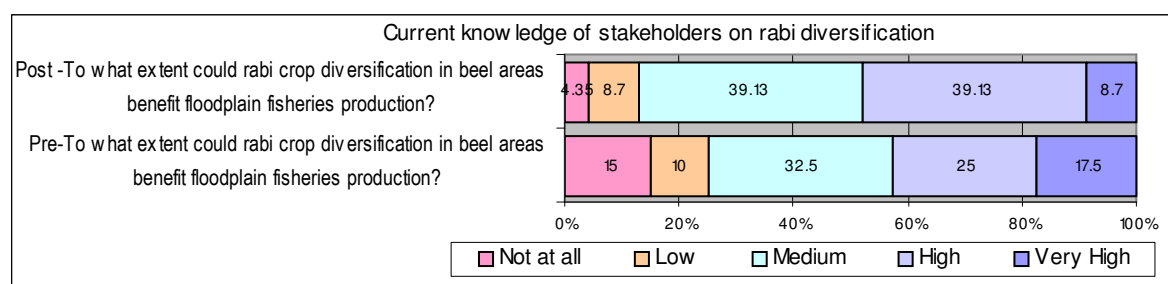


**Figure 4: Knowledge on SRS**

### 3.1.4 Diversification of rabi crops

Dry season water shortages in floodplain beels has been identified as one of the key obstacles to sustainable natural fisheries production, as the most of the beel become dry (or near to dry), making the fish vulnerable to both natural and fishing mortality, leaving hardly any stock to balance population size and maintain production level at a sustainable level. Moreover, boro rice (winter rice) cultivation is widespread in the flood plain beel basin and this crop is termed a water hungry crop. It requires 10,000 cubic meters of water abstraction to irrigate 1ha of boro, while alternative rabi crops like onion, garlic, wheat, maize, winter vegetables require one-third or one-fourth of the water requirement (irrigation) of boro rice.

Therefore, a large volume of scarce dry season water could be saved and made available for fish, if a substantial part of the floodplains could be brought under alternative rabi crop cultivation, instead of boro. To this end, varying knowledge levels were found among the respondents, and found increased knowledge among the respondents in post survey than the pre survey round (Figure 5).



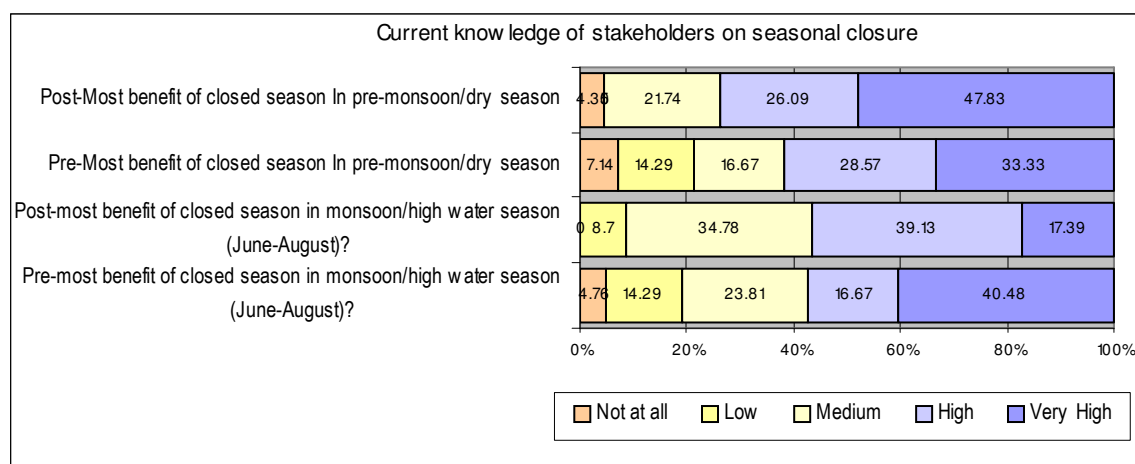
**Figure 5: Knowledge on rabi diversification**

### 3.1.5 Seasonal fishing closure

It is evident that Bangladesh’s floodplain fisheries have been under serious fishing pressure. Studies reveal that the fishing pressure is such that less than 2% new recruits can manage to escape being caught at the end of each year, and if this situation continues the floodplain fisheries are likely to decline substantially. Therefore, it become necessary to adopt seasonal closure of fisheries, and various projects have been trying fisheries management in conjunction with communities and have experienced positive results. However, there are questions to be resolved as to what would be the best time for seasonal (time closure) closure, to ensure maximum benefit. To this end, respondents were asked to express their thoughts on when to adopt seasonal closures, and whether most benefit would be obtained from wet season, or pre-monsoon, closure.

The respondents expressed almost equal preference for both the seasons. The fact here is that closure in any month or season (two months or three months) is beneficial to varying degrees. However, it has been assessed that pre-monsoon closure could give better results as this protects

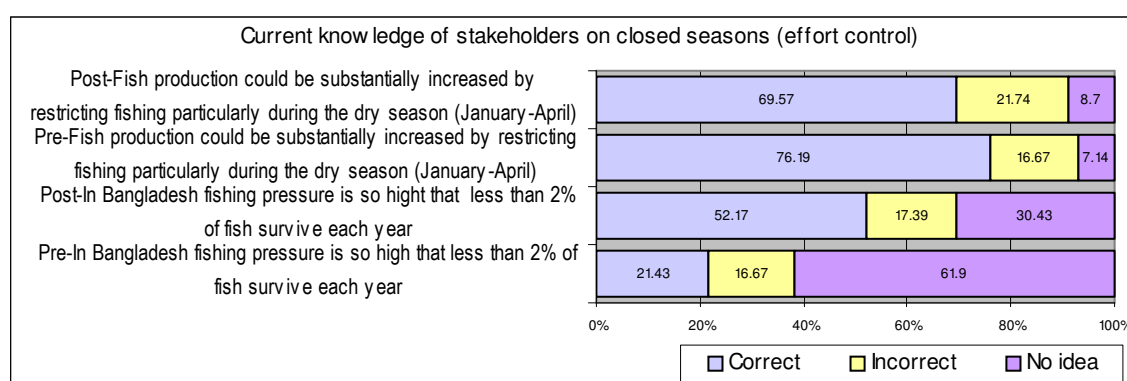
the brood prior to spawning season, and if the brood stock is protected pre-monsoon, they can successfully spawn in early monsoon with the onset of the rains. As observed, understanding of the respondents become clearer in the post survey compared to that of the pre survey (Figure 6). However, a few respondents said there would be no benefit of seasonal closure whether it is adopted in monsoon or pre-monsoon. Thus it can be concluded that there is gap in knowledge among some stakeholders on the necessity and timing of seasonal closure.



**Figure 6: Knowledge on effort control**

Another statement specifically asked the respondents whether dry season closure (January-April) could produce substantial benefit and most of the respondents (around 70%) said correct in both survey rounds and few (less than 10%) did not have any idea on the issue.

Study findings suggested that fishing closure in any month of the year can contribute to increased fish production to varying degrees, ranging from a minimum of 25% increase in catch for August closure, to as high as 102% for January closure. Thus, if closure is adopted in any month of the year the minimum increase in catch is substantial - 25% (as per the PIRDP modeling results). To learn more, participants were asked to express their opinion on whether this negative statement is correct that 'closure in any month of the year would produce very little impact (say less than 5% increase in catch)'. Majority the respondents support this negative statement, saying it was correct, thus implying that they have little knowledge on the issue, while some disagreed with the statement (Figure 7).



**Figure 7: Knowledge on closed season (effort control)**

When presented with the statement: 'fishing pressure is very high in Bangladesh's floodplains and studies revealed that less 2% fish survive each year', -many participants (61%) stated that they did not know about the issue, whilst 21% stated that this was incorrect (Figure 7). Thus only 17% of respondents had an idea as to the detrimental effects of current fishing pressure (although they gave the right answer, for this type of true/false question the possibility of them just guessing is high, despite the 'don't know' option being available).

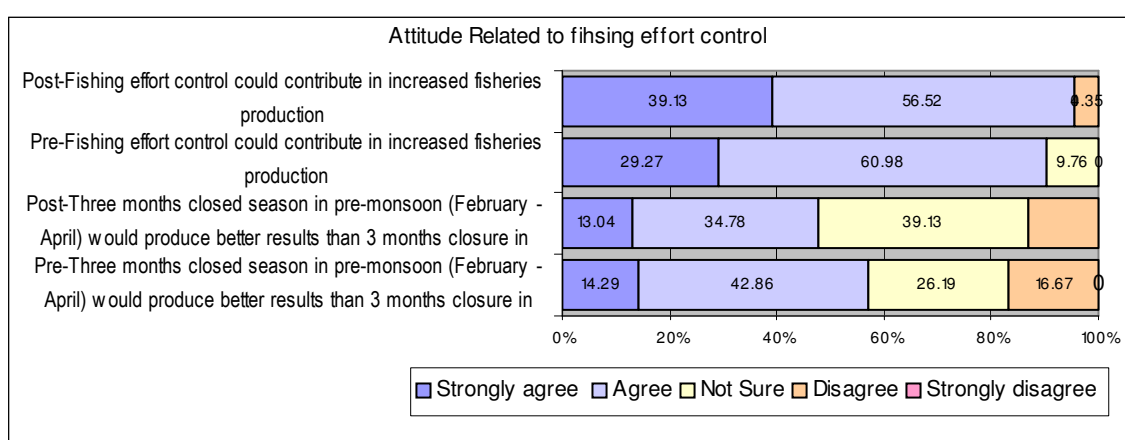
## 3.2 Attitude of stakeholders on fisheries issues

Attitudes of stakeholders on various fisheries management interventions have been assessed through responses made to various attitudinal statements.

### 3.2.1 Fishing effort control

Limiting fishing effort for sustained fisheries was one of the statements and most of the respondents showed positive attitude to limiting fishing effort or support effort control measures. Figure 8 shows that majority of the respondents agreed with effective control of fishing effort in both the survey rounds, realizing that the current level of effort is very high and a cause of declining floodplain fisheries production.

The issue of whether the seasonal closure should be pre-monsoon or in monsoon is not clear among the respondents. Although majority favored pre-monsoon closure over monsoon closure, there were opinions against pre-monsoon closure too.



**Figure 8: Attitude on effort control**

### 3.2.2 Conservation of biodiversity and SRS

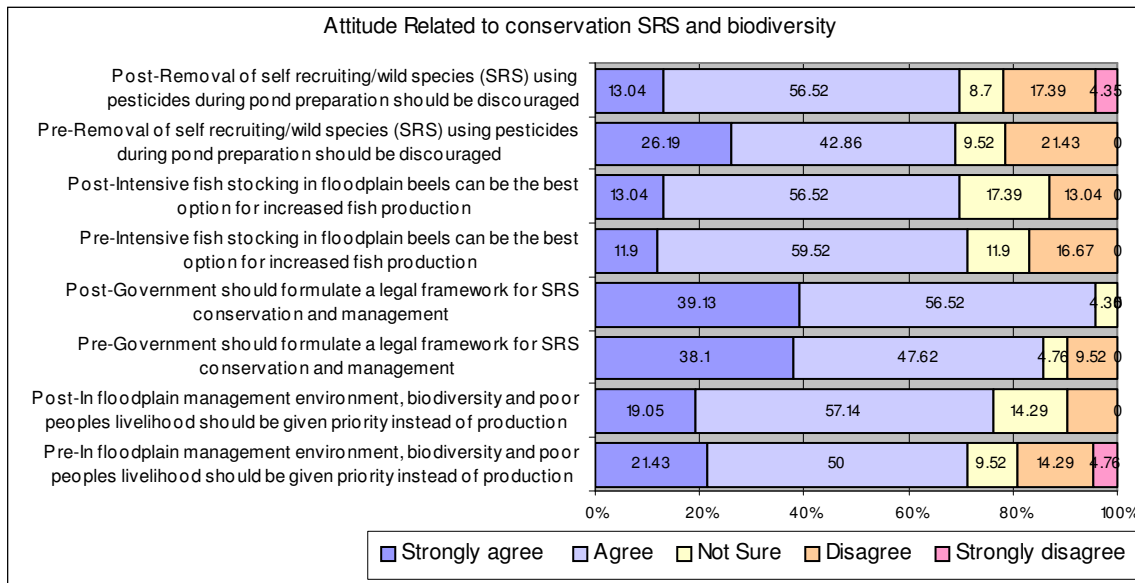
The attitude of respondents towards conservation of SRS was positive. Data shows that the majority of respondents (69%) agreed with the statement that removing SRS by poisoning during pond preparation should be discouraged. However, 21% disagreement with the statement and 4% were not sure as to whether the SRSs would be removed or not. Currently there is no regulatory regime on the conservation of SRS in aquaculture practices; rather removal of SRS is encouraged in aquaculture practices, as these are treated as weed fish that compete with culture species in ponds and hamper desired fish species' production. Although, there is no regulation, 86% respondents showed a positive attitude and agreed with the statement that the government should formulate a legal framework for conservation of SRS for the benefit of the poor.

Apart from SRS, the majority of the respondents showed a positive attitude towards conservation of biodiversity, environmental protection, and poor peoples livelihoods, as opposed to the idea of increasing aquaculture production in floodplain management planning. This statement however, is linked with the issue of conservation of SRS. Figure 10 shows that majority of the respondents showed a positive attitude to this issue. However, some showed a negative attitude, considering the environment and biodiversity issue, rather preferring an increased production approach and some did not have any preference (Figure 9).

Although the majority of the respondents showed a positive attitude towards the conservation of SRS and biodiversity, the majority of them supported the idea of an intensive fish-stocking program in the floodplains as the best option. Note that the impact of intensive floodplain stocking with carps on SRS has not been clearly evaluated and is not understood, however, it is assumed that large scale



stocking in the wild may have a negative impact on SRS and access of poor to fishing. Analyzing this statement it can be ascertained that the respondents could not articulate various facets of floodplain fisheries issues, including environment, conservation, biodiversity and livelihood of poor, with production options, and thus their attitude is still biased towards increased production over other important aspects.



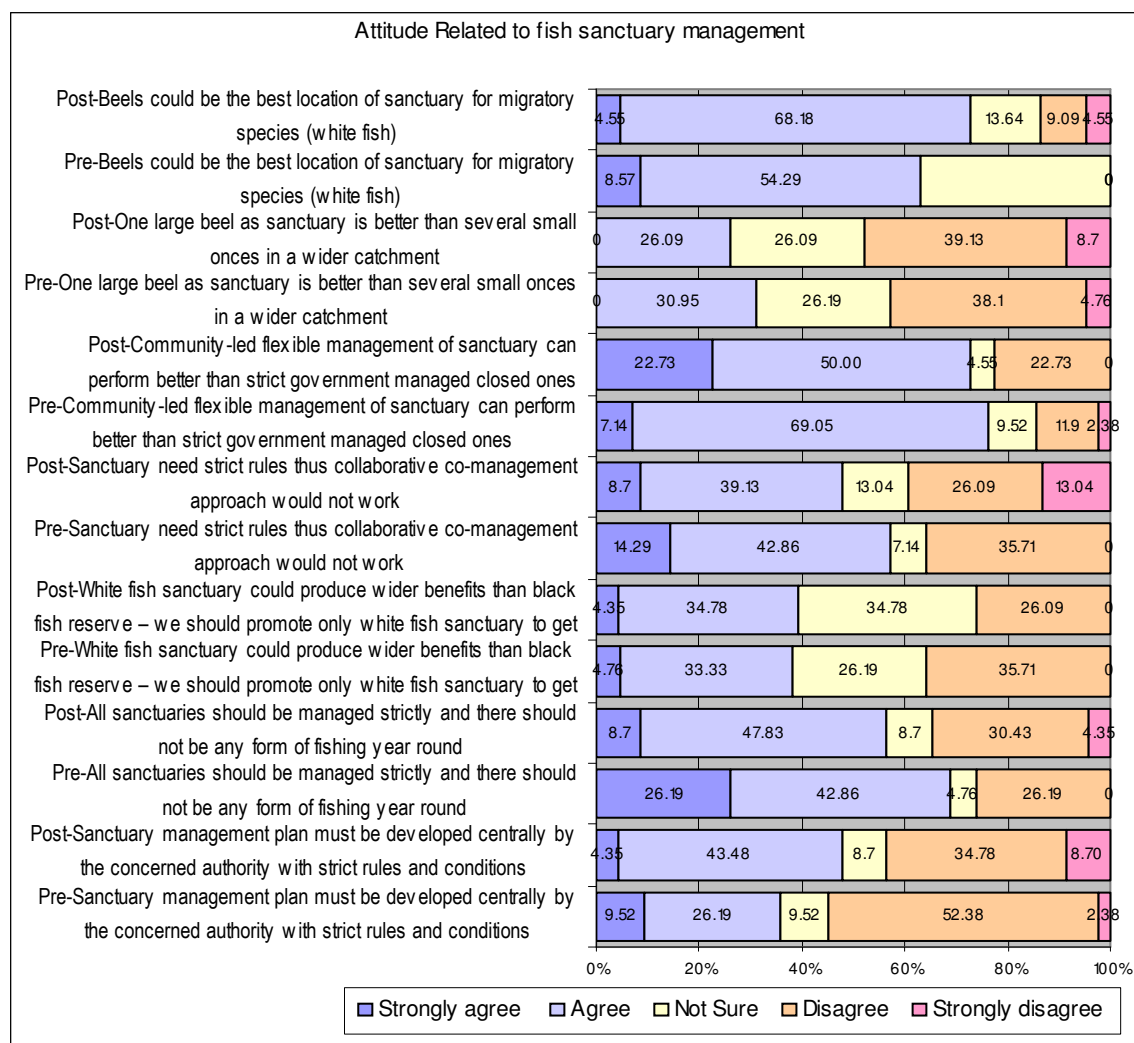
**Figure 9: Attitude on SRS**

### 3.2.3 Sanctuary management

A positive attitude has been observed among the stakeholders surveyed about the establishment and management of floodplain fish sanctuaries for the sustainable conservation of fisheries and benefits thereof. However, there are differences in attitudes among the stakeholders as to the norms and systems of sanctuary management and majority preferred community-led flexible management could produce better results, as opposed to strict government management control.

Regarding on-site management, the attitude of the majority was found to favor strict sanctuary management rules, that there should be no fishing allowed year round. This is probably due to the fact that if a flexible norm of fishing is allowed, it encourages fishing within sanctuary making it harder to maintain the sanctuary for conservation purposes.

Regarding the aim of conserving fish populations as a whole, covering white and black fish, both knowledge and attitude among the stakeholders was found to be poor. In both the survey rounds majority supported beel for sanctuary management as river is not under any management (out of lease). White fish sanctuaries can create wider benefits as these are usually established in river systems where they can also act as refuges for migratory white fish, amongst other species, thus benefits of white fish sanctuaries usually cover a wider range. On this matter based on findings implying that they would prefer sanctuaries to support both white and black fish, protecting both riverine and beel resident species (see Figure 10).



**Figure 10: Attitude towards sanctuary management**

### 3.2.4 Sluice gate management

Sluice gate management targeting fisheries production enhancement and livelihood development for the poor people living inside FCD/I project is an important issue in poverty reduction and environmental management. Studies recommended that sluice gates could be managed in a way that would benefit fisheries production and biodiversity inside FCD/I and improve the livelihoods of poor fishers without damaging crops.

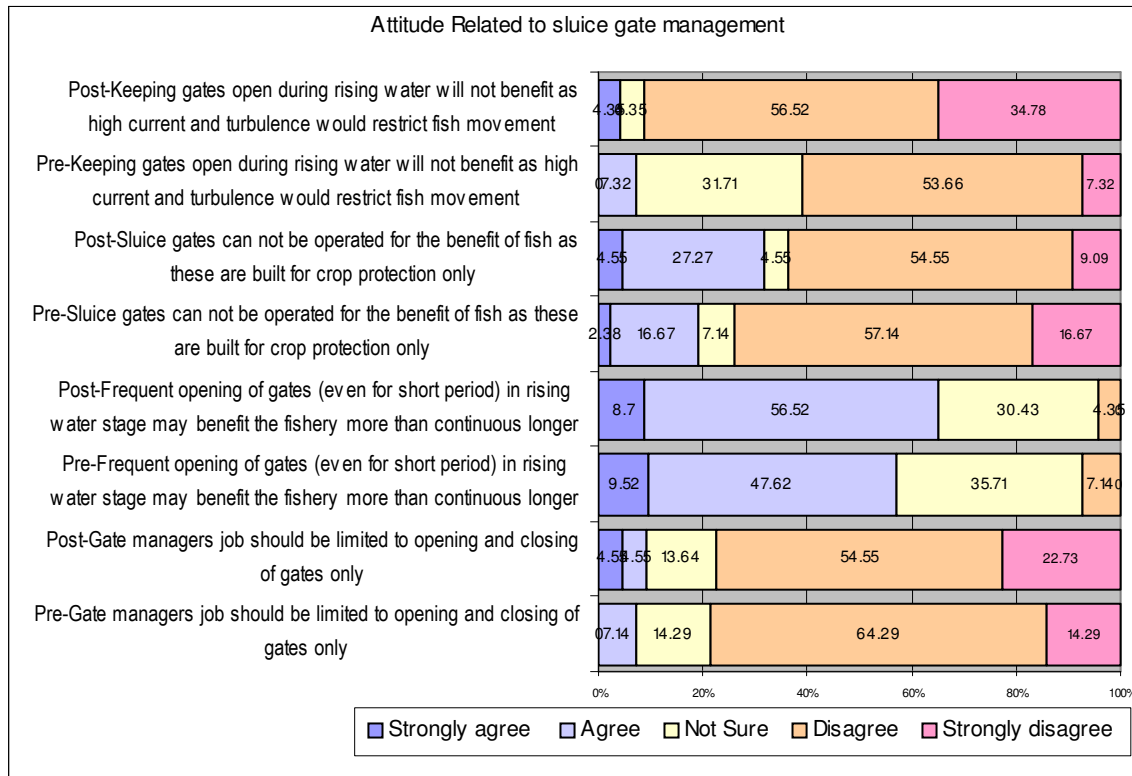
However, this requires policy and management decisions as to whether and how these sluice gates could be operated in a fish friendly manner, when they have been built for the sole purpose of flood protection for crops within FCD/Is. The attitudes of relevant stakeholders on this issue are key to putting the research findings in to action.

It should be noted that strong currents and turbulence could be a major barrier in fish friendly operation of sluice gates, particularly for small fry and hatchlings. A relevant statement was made that 'opening gates in rising water will restrict fish movement due to high current and turbulence' but the majority of respondents disagreed, reckoning that it would facilitate fish migration. However, a number of respondents were undecided, and agreed with the statement that opening sluice gates in rising floodwater would not serve the purpose of fish migration (see Figure 11).

Although some practice and research findings show that existing sluice gates can facilitate fish migration, there is a belief among some stakeholders that sluice gates can only protect crops from floodwater, and that as no provision is explicitly made for fish movement, it is not possible through

these structures. Responses from stakeholders to this were positive, as the majority disagreed with the statement and some respondents believed that it was not possible to use the existing gates (without required changes) for fish migration and a few said they didn't know (Figure 11).

Although more than half showed a positive attitude and supported the statement that frequent gate opening in rising floodwater is better than continuous longer opening, a good number said they had no knowledge on the issue and disagreed with the statement (Figure 11). Attitudinal differences exist that need to be worked on to enhance knowledge and adjust attitude.



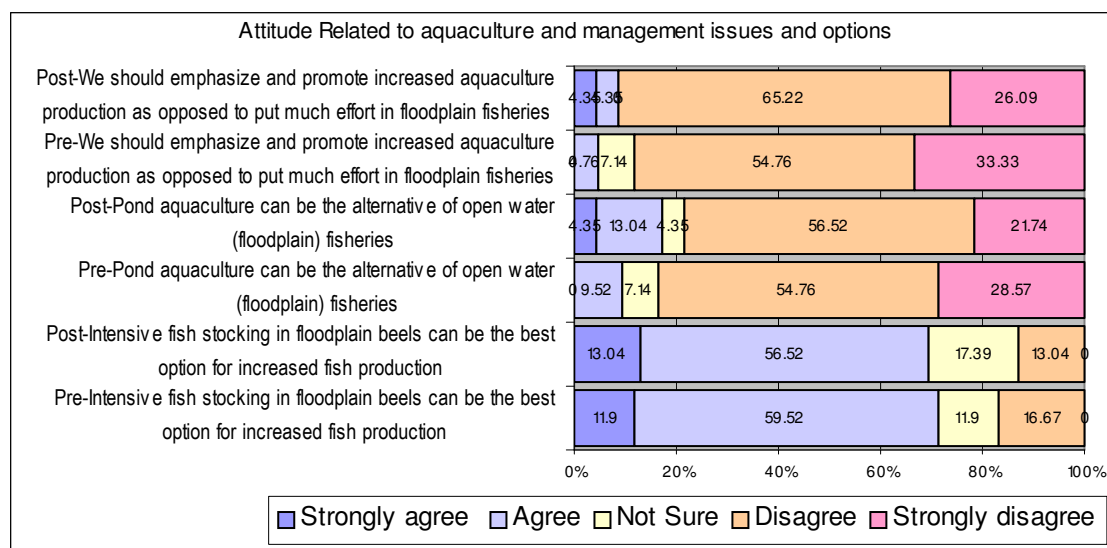
**Figure 11: Attitude related to sluice gate management**

### 3.2.5 Management options

Although most of the donors supported government fisheries projects, working in smaller management units, based on single water-bodies (except MACH and some CBFM2 site), the respondents showed a strong bias towards wider management units (catchment-wide integrated floodplains management as opposed to single water-body management). Survey findings shows that majority were in favor of catchment-wide management (Figure 12).

The focus and priority of floodplain fisheries management varies from project to project, however, the common target of all project is primarily technical, i.e. production increase with lesser focus on social, institutional and environmental issues. Thus, government projects often have large-scale floodplain stocking components aimed at increasing production rather than conservation and sustainable management of existing natural stocks. The majority of respondents showed positive attitude to the statement that 'intensive stocking in floodplain beels can be the best option for increased fish production' (figure 12).

Conversely, in another relevant statement most of the respondents agreed to floodplain fisheries management compared to promotion of aquacultural production, disagreeing that 'we should emphasized and promote increased aquacultural production as opposed to put much effort on floodplain fisheries management'.



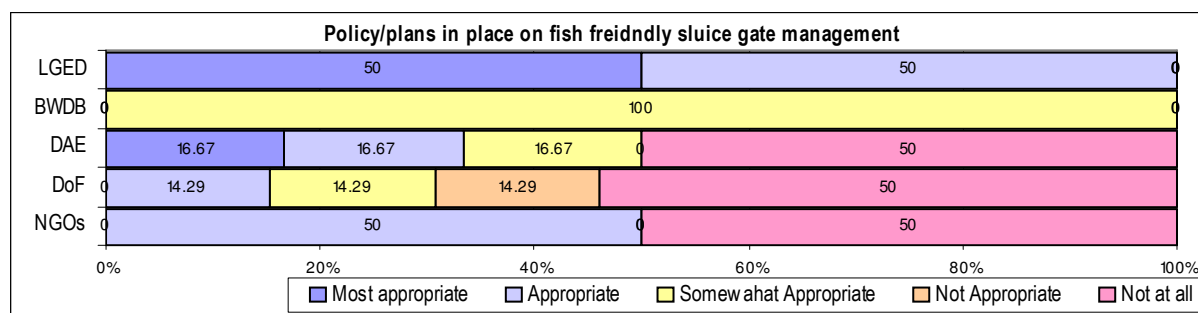
**Figure 12: attitude towards management options**

### 3.3 Practice

The practice of any intervention or management option in floodplains whether physical (effort control, cropping pattern or sluice gate management) or skill development (training) or research (hydrology monitoring or fish catch monitoring) is the reflection of acquired knowledge that influence the attitude of decisions makers/planners of any organization or agency and finally brought in to action through a set of activities. In judging the practice, it is therefore most appropriate that the practice level information can be best assessed through physical observation and/or review of relevant reports and documents. It is also a key that there should be a policy or a plan or a guideline in place for activities that are in implementation at field level to achieve some set of objectives.

#### 3.3.1 Practice related to fish friendly operations of sluice gates

To this end, respondents were asked to respond whether they (their respective agency) have any policy or plan against some interventions relevant to floodplain fisheries/resources management. In response to having a policy or plan on fish friendly operation of sluice gate, varied responses were found in case of more than one respondents from the same organization or department. Of the two respondents (Project Director and Environment Consultant, small scale water management project) of LGED, one said they have most appropriate policy/plan for fish friendly sluice gate operation while one said the policy is appropriate (he feels that there is scope for further development) (Figure 13). However, this policy of plan is for the project, not necessarily for the LGED as whole. The respondents also said that they have guidelines on fish friendly sluice gate management available, which is effective/most effective from the field implementation point of view (Figure 14).



**Figure 13: Policy or plan in place on fish friendly sluice gate operation**

The respondent from BWDB said they have a policy/plan on fish friendly sluice gate management in place but is not updated & comprehensive and thus from the qualitative point of view was ranked as

somewhat appropriate (which is better than not appropriate). Although, BWDB has a policy on fish friendly operation of sluice gates but they do not have any guideline on this thus no clear instruction on how to make it operational at the field level is available without which it may often be difficult to make it operational (Figure 14).

The participants from DAE responded differently on the issue of sluice gate management though they are from the same government agency. Here half (3 out of 6) of the respondents said that DAE has no policy or plan on fish friendly operation of sluice gates while one said it is there but not appropriate, one said the it is appropriate and the other said most appropriate. The persons who said yes and appropriate are associated with DAE project and thus the plan is project based. However, on the issue of presence of a guideline related to fish friendly operation of sluice gate, all but one said DAE does not have any guideline on the issue (Figure 14).

Like the DAE, DoF also has no organizational policy of plan on fish friendly operation of slice gate as 50% said so (Figure 13) while one each said there is a policy/plan on the issue and that is most appropriate, appropriate and somewhat appropriate respectively. The respondents who said there is such a policy they referred to DoF's project plan. It is noted that the FFP and CBFM2 projects of DoF have been trying fish friendly sluice gate operation where appropriate in the project sites.

The DoF is lacking of any suitable guideline at their organizational on fish friendly operation of sluice gate as 57% said there is no any (Figure 14). Therefore, it can be said that the DoF does not have any organizational policy or guideline on fish friendly sluice gate management, which is important for fisheries enhancement inside modified floodplains though. However, DoF has recently developed an inland fisheries strategy where the issue of fish friendly operation of sluice gate is incorporated.

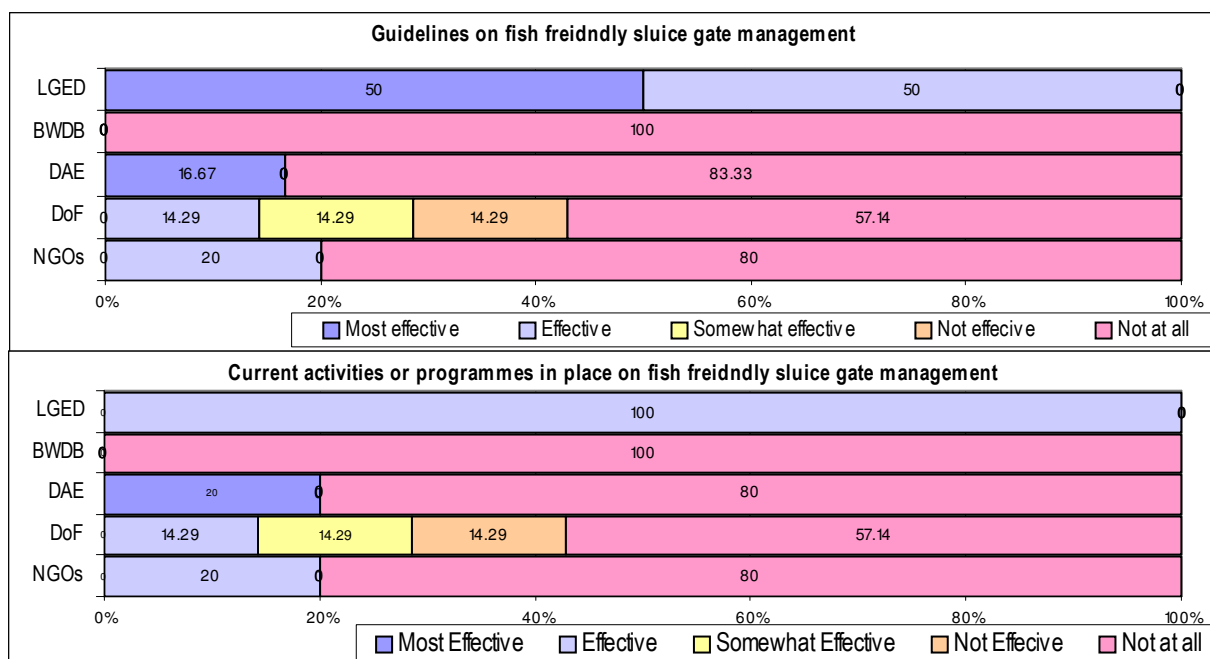
NGOs (Caritas, Proshika, BRAC, BELA) working as partner of DoF projects were also asked about their organizational policy or plan on sluice gate management and found that 50% said they do not have such plan and others said they have effective plan on the issue (Figure 13). But again that is also at project level (FFP and CBFM2). In terms of having any guideline for sluice gate operation, over 80% said there is no such guideline at their organizational level while others said they have effective guideline on the issue (Figure 14).

Besides having a policy or guideline on fish friendly operation of sluice gates, it was also strived to get an understanding of the organizations current program/activities on sluice gate management in place at the field level under any project or as regular organizational activities.

As regard to the field level activity of relevant government agencies and NGOs on fish friendly operation of sluice gates to facilitate fish migration and enhancement of impacted fisheries inside modified floodplains (within FCD/I projects), the responses are rather frustrating. As seen that the LGED only practicing fish friendly operation of sluice gates at their project (small scale water management project) sites and according to their assessment the extent of practice so far in place is effective. However, it is not confirmed whether other projects of LGED has similar activities or not.

It is learnt from the responses that BWDB has no sluice gate operation activity that could contribute to enhance fish production and species diversity (through facilitating fish migration between rivers and floodplains) within FCD/I projects at the field level although they build most of the FCD/I projects in the country that caused serious negative impacts on floodplain fisheries (Figure 14).

DoF is also seen not making much progress in this respect as 57% of the respondents said that they do not have any activity relevant to fish friendly sluice gate operation at field site while others said whatever the have activities relevant to sluice gate management at field level is to some extent between not effective to effective/most effective at the project level. Similar situation prevails in DAE where over 80% said they have no such program or activity at the field level (Figure 14). NGOs also do not have any field level activity or program on sluice gate operation as 80% said no except one said they have effective field level activity on fish friendly operation of sluice gates, this is again under a project.

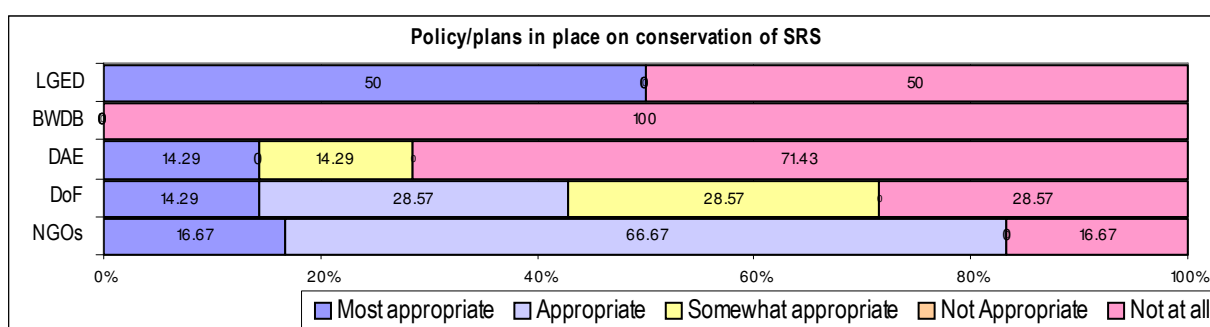


**Figure 14: Guidelines and field activities on fish friendly sluice gate operation**

### 3.3.2 Practice related to conservation of SRS (self recruiting species)

Self-recruiting species that are quite diverse and rich play a vital role in the diet of the poor people of Bangladesh. These species are available in all sorts of wetland habitats including open flowing rivers to closed or small seasonal rivers/khals and large flooded haor basins to small seasonal beels within FCD/I projects and large semi-closed baors to small closed ponds including aquaculture ponds. These species are however, seriously impacted due to habitat alterations, over fishing, drying up of wetlands and removal from aquaculture ponds as weed fish. The fisheries policy also ignored the value of small SRS and lacking of any specific guideline to protect these species. Although availability of SRS is still at a reasonable extent due to their high resilience, the production trend is declining, thus care is needed to reverse the trend. It is therefore, imperative that DoF, NGOs and other relevant government agencies should come forward to protect the SRS for benefiting the poor.

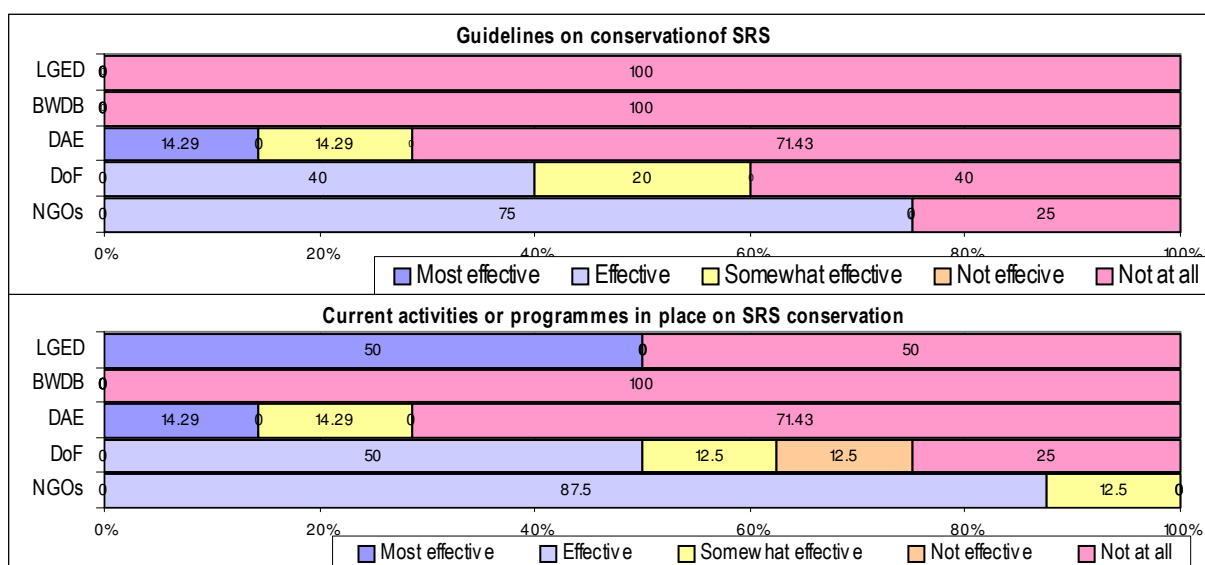
To this end, LGED has a policy or plan to protect the SRS as claimed by the project director of “small scale water management” project however, the environment specialist of the same project said that they do not have any policy or plan on conservation or culture of SRS. Thus it is questionable whether the project has any such plan or not. BWDB has no policy on conservation SRS. Majority of the respondents (over 70%) from DAE also said that they do not have any policy on SRS conservation while 2 respondents associated with projects said they have effective policy on SRS (Figure 15).



**Figure 15: Policy or plans in place on SRS at organizational level**

DoF being the national focal point of fisheries should have an explicit policy on SRS conservation and protection. As found in the survey, 29% respondent said that they do not have any such policy while 29% mentioned about a policy but that is not appropriate (Figure 15). This means majority of the respondents have a feeling that no appropriate policy DoF has on SRS. However, 44% respondents of DoF said they have policy on SRS and that is appropriate/most appropriate but the policy or plan they claimed exist only at project level. In contrast, 3 out four NGOs claimed that they have plan for conservation of SRS and they feel the policy or plan is appropriate.

There is lacking of a guideline on SRS conservation and management in all four relevant government agencies active in floodplain fisheries at varying extents. Although the project Director of LGED claimed that have policy/plan on SRS conservation and management but they are lacking of any guideline for the implementation of activities at the field level aiming at conservation and sustainable management of as both of them (project director and environment specialist of the project) said they are lacking of any relevant guideline (Figure 16). BWDB also have no guideline on SRS. DAE is also lacking of a guideline of SRS as over 70% said so, however, one (out of 6) of the respondents (14%) said they have most effective guideline and one said the guideline is not effective.



**Figure 16: Guideline and field activities on SRS**

DoF is also lacking of a guideline except what they have at the project level (40% said they do not have any guideline on SRS). However, the project level guideline appeared effective as the respondents mentioned. However, 20% assessed the guideline as not effective (Figure 16). The NGOs claimed that the guideline they have on SRS is effective while 25% said they do not have any guideline on SRS although all NGOs said that they have policy/plan on conservation of SRS.

Regarding the current program or field level activities related to SRS conservation and management, two respondents of LGED responded differently. The Project Director (small scale water management project) claimed that they have field level program or activity on SRS while the specialist of the same project who works exclusively for the project for long time said they do not have any field activity specially targeting conservation of SRS. It is known that the LGED project is mainly targeting increase production of rice by protecting floods (or water management) while mitigating fisheries through facilitating (introducing) fish stocking based floodplain aquaculture within empoldered areas.

The BWDB as usual do not have any activity at the level aiming at conservation of SRS. DAE is also having no organizational activity on SRS at the field level (as 71% said DAE has no field programme on SRS) while they have some activity to manage floodplain fisheries under development projects. The situation of DoF as mentioned by the respondents is not very promising as 50% said they have an effective field program but that is at project level and 25% said that DoF have no such program at the field level indicating that the field activity has under project is not focused on SRS. Three out of four

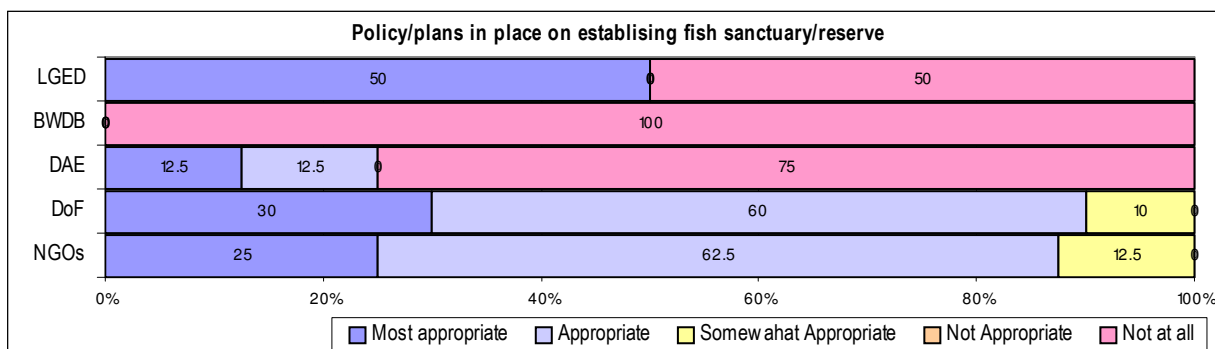


NGOs claimed that they have effective programme on SRS at the field level (Figure 16).

### 3.3.3 Practice related to establishment of sanctuary/reserve

Bangladesh floodplain fisheries are under serious threat of over fishing, more and more people are getting involved in fishing either part time or full time. The destructive fishing practices viz. complete dewatering in the dry season and by fixing bunds across channels/water ways (fixed engine) are in rising negatively impacting fish production and species diversity. Establishment and management of fish reserves or fish sanctuaries (now popularly used in Bangladesh) have been tested under various projects. The government is also taking it seriously for extension of this intervention. However, before wider practice, it is important to have a policy and guideline on sanctuary management so that these could produce benefits as well as contribute to livelihoods of the poor fishers who subsist mainly on fishing.

To this end, respondents were asked whether they have any policy/plan and guideline on sanctuary and the extent of its appropriateness or effectiveness. Figure 17 shows that BWDB has no policy/plan and thus no guideline and field activity relevant to fish sanctuary establishment and management. LGED also has similar situation but the project director, Small-scale Water Management Project claimed that they have sanctuary policy and that is appropriate to serve the purpose. However, the Environmental Specialist who is responsible for environmental assessment of project interventions and working full time for the project said they do not have any explicit policy on sanctuary management. Both of them however, agreed that LGED do not have guideline on fish sanctuary establishment and management and so they do not have relevant field activities.



**Figure 17: Policy or plan on fish sanctuary management**

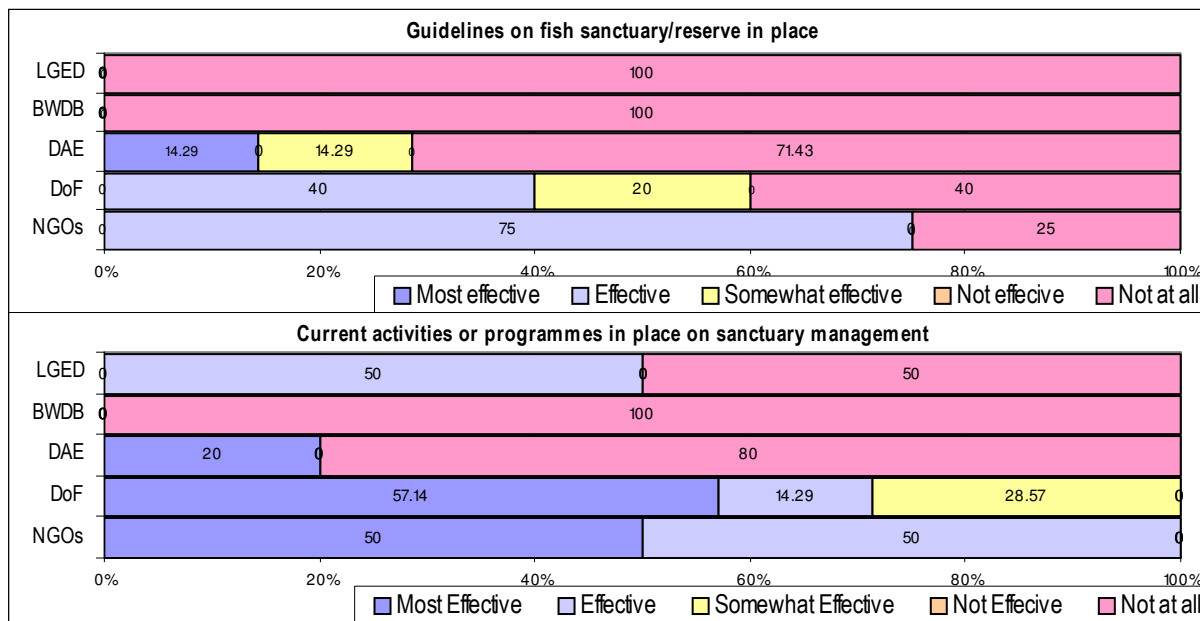
Although majority (75%) from the DAE said they do not have any policy in place on fish sanctuary management, respondents working for the DAE development projects said they have plan at their project level where conservation of natural fish in floodplains is considered. They however, respondents mentioned that DAE is lacking of any workable guideline for management of fish sanctuaries (Figure 17).

In contrast, there is policy and plans on fish sanctuary/reserve management in place at DOF and partner NGOs. However, most of the respondents highlighted that the policy/plan and the guideline on fish sanctuary needs improvement to make them most appropriate to technical, social and institutional contexts.

All the respondents from partner NGOs said that they have field level activities relevant to fish sanctuary establishment and management. Two NGOs felt assessed that their relevant field activities are being effectively implemented while one NGO felt it is not up to the mark and one felt it is running very effectively.

DOF respondents have varied observation and assessment on fish sanctuary related to the level of effectiveness to produce the desired out puts. More than half of the respondents (70%) have a feeling that field implementation of sanctuary activities are running at effectively/most effectively while 30% felt it is not up to the mark (Figure 18).

DAE has practically no field level activities on fish sanctuary establishment. However, one DAE respondent associated with development project claimed that field activities relevant to conservation of fisheries are running most effectively at project level.



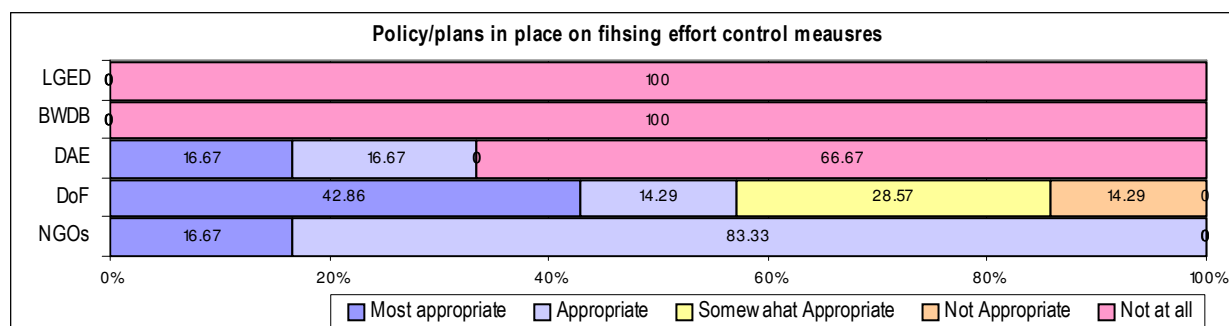
**Figure 18: Guideline and activities on fish sanctuary management**

### 3.3.4 Practice related to fishing effort control measures

All the respondents of DoF said that they have policy/plan and guideline on fishing effort control as measure to reduce fishing pressure and thereby enhance floodplain fisheries production and species diversity. However, regarding the policy in place there have been varied opinion as seen in Figure 19 that 60% felt that the policy/plan on effort control now they have is most effective/effective while 40% felt it is not that effective as it should be (somewhat effective/not effective). Similar observation is revealed in case of having a guideline on effort control at DoF where majority said that the guideline they have is effective while one said they do not have any guideline on the issue. At field level implementation of effort control measures, majority expressed satisfaction as to the level of effectiveness of the intervention although a few expressed dissatisfaction regarding effectiveness to produce any impact.

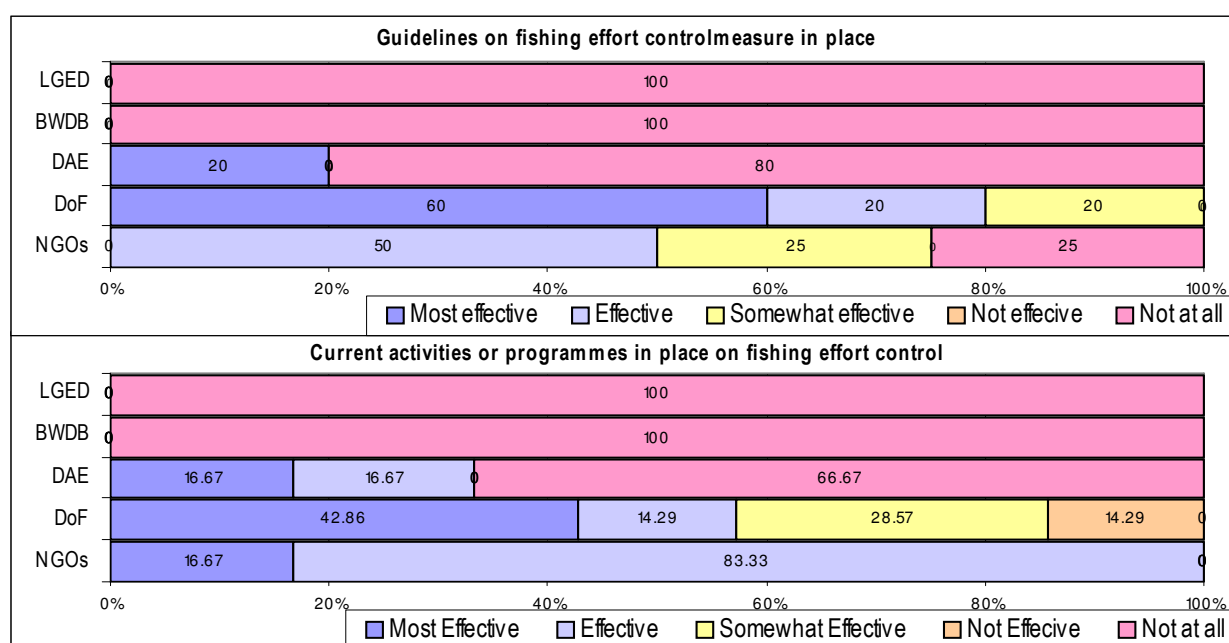
The partner NGOs of the DoF involved in implementing various projects (e.g. FFP, CBFM, MACH) have policy/plan on fishing effort control measures (closed seasons and closed area) at their project level. The respondents from the four NGOs mentioned that the plan on the issue they have in place is effective. However, regarding the guideline on effort control measures, respondent from one NGO said they do not have any guideline while two NGOs said that they have effective guideline on effort control. The practice of effort control measures at field level was assessed and found that some NGOs only enforce closed area as measure to reduce effort level, they do not practice closed season (time closure) at field level. While other NGOs do practice only closed season at the field level as a measure to control efforts (Figure 20).

DAE do not have any policy/plan on fishing effort control measures at organizational level. However, at project level, they have plans not to affect floodplain fisheries. Likewise they do not have any guideline on effort control as over 70% mentioned so during the survey although two project level respondents said they follow a guideline that is somewhat effective. Majority of the respondents have the same feeling that the relevant field level activities are not there in place except at project level, which they mentioned, effective.



**Figure 19: Policy or plan on fishing effort control measures**

LGED has no policy and guideline on fishing effort control measures at its organizational level. However, the project director claimed that they practice closed season as effort control measure at field level and that is most effectively being implemented. BWDB has no policy, guideline and field level activity on fishing effort control.



**Figure 20: Guideline and activities/programme on fishing effort control measures**

## 4. Conclusion

### Knowledge

- Knowledge on fish sanctuary/reserve was found satisfactory among the stakeholders surveyed among the government and NGOs. Most of the respondents have good understanding of the benefit of sanctuary in enhancing fisheries production and conservation of species diversity. However, the understanding of key issues in establishing sanctuary in terms of locations (whether it should be in rivers or in beels or in both the habitats and for why), about the rules (whether flexible or rigid), about numbers (one large sanctuary of several small instead) was found not very clear. However, in the post survey better understanding of the issues was reflected.
- Regarding sluice gate management respondents demonstrated a broad understanding of sluice and its operation to benefit fisheries. Majority have an understanding that sluice gate can be operated in a way that have potential for benefiting fisheries inside FCD/I. However, regarding timing of opening the gate for realizing maximum fisheries benefit was not clear among some stakeholders.

- Majority of the respondent have clear understanding on the benefit of SRS conservation to support livelihood of poor and supported that government should come up with a regulation on SRS conservation.
- Respondents demonstrated good understanding of fishing effort control but did not have clear idea about the extent of current fishing pressure on Bangladesh floodplains. There is also lack of understanding in the key issue of duration and timing as to when the fishing closure should be, whether in the pre-monsoon dry season or in wet season? However, during the post survey round the stakeholders demonstrated better understanding on the issue.
- Understanding regarding rabi crop diversification in floodplain beel areas for benefiting floodplain fisheries was found not clear among majority of respondents. During the post survey round some enhancement of understanding in this issue was recorded.

## **Attitude**

- Majority of the respondents showed positive attitude towards fish friendly operation of sluice gates to benefit the impacted fisheries inside FCD/I projects.
- The issue of discouraging or stopping removal of SRS (treated as weed fish) from aquaculture ponds is not supported by all stakeholders even though majority has a feeling to conserve SRS. It is due to the fact that aquaculture recommends cleaning of SRS to get good production of desired cultured species. Although majority showed positive attitude on SRS conservation and its importance but majority supported massive floodplain stocking with carps that may have negative impact on SRS. Issues related to environment and biodiversity are well discussed in the country and the government has projects on biodiversity conservation, but some respondents still showed positive attitude towards increased production at the cost of biodiversity and environment. This may be due to the production biased national policy of the country.
- Majority demonstrated positive attitude towards sanctuary management but many were found strict on inflexible centrally dictated sanctuary management rules as opposed to community managed flexible norms.
- Majority showed positive attitude on sluice gate management in way to benefit fisheries. They also supported that the gate managers scope of work should not be limited to gate operation only rather be widened to cover over all fisheries and crop management issues. The BWDB also supported fish friendly operation of sluice gates and for which they are willing to extend any assistance.
- Regarding the boundary of floodplain fisheries management positive attitude of respondents was observed. Their attitude towards the conventional approach of defining single beel as management unit, majority preferred considering wider catchment as management unit for floodplain fisheries to produce better impact.
- The stakeholders also showed negative attitude to the conventional thought that aquacultural production can be the best alternative (or replacement of floodplain fisheries). Majority showed negative attitude to initiate floodplain aquaculture at the cost of floodplain fisheries, which often the policy stakeholders support.

## **Practice**

- Various attributes relevant to good practice of floodplain fisheries management and enhancement are found poor among all the stakeholders of government and NGOs. It is found that the BWDB practically has no plan and activity at the field level relevant to floodplain fisheries.

- DoF's activities relevant to floodplain fisheries are still project dependent. However, through FFP they have developed good skills and understanding. DoF, through the FFP developed inland capture fisheries strategy and submitted to Ministry of Fisheries and Livestock (MOFL) has incorporated all the issues, if approved, improvement at practice level is expected.
- Although all the TIs except BWDB mentioned that they have field level activities on sluice gate management, effort control, sanctuary management, conservation of SRS, most of them do not have any policy/plan or guideline on the interventions. The plans and guideline that the TIs mentioned they have are not at up to the standard (not appropriate) that need improvement to make them comprehensive.
- The activities relevant to FMSP options suggested are in place at the project level of TI's not at the organizational level thus still need effort to mainstream the better practice of FMSP new knowledge in to practice.