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**Site-Level Field Appraisal  
of  
Wetland Co-management: IPAC Kangsho-Malijee Site**



# **Site-Level Field Appraisal for Wetland Co-management: IPAC Kangsho-Malijee Site**



**Prepared for:  
International Resource Group (IRG)**

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## Executive Summary

1. Rapid Appraisal through PRA was conducted to make a comprehensive situational analysis of the IPAC Kanghso-Malijee (K-M) site during January-February' 2009, aiming at helping to shape the future activities for the improved management within IPAC Project. Specifically, the appraisals focused on assessing the impact of post MACH period, identifying major stakeholders, understanding reasons for the wetland and forest degradation and its underlying facts, identifying the challenges for the project and exploring the opportunities for its improve management. In addition to application of various tools, like trend and seasonal analysis, Venn diagramming, livelihood analysis, ranking, scoring, resource mapping etc., a series of household and group interviews, and focus group discussions were also conducted.
2. The Kangsho-Malijee (K-M) Site bordering with Garo Hill Complex of Meghalaya, India to the north, Mymenshing and Jamalpur District on the South, Mymenshing District is on the East, and Jamalpur District is on the west. There are five upazilas under this district, namely: Jhenigati Upazilla, Nakla Upazilla, Nalitabari Upazilla, Sherpur Sadar Upazilla and Seebardi.
3. IPAC Konghso-Malijee (K-M) Site is situated within Sadar and Jhienaigati Upazilla under Shepur District. It covers 14 unions of both upazilla with 7 from each. Unions under Sadar upazila are: Pakoria, Bhatshala, Dhola, Bajitkila, Kamaria, Gazir Khamar and Sherpur Pourashaba. and that under Jhienaigati upazila are: Malijikhanda, Hatibandha, Jhienaighati, Gouripur, Nolkura, Dhainshail and Kangsha. The project area is about 200-240 km east of Dhaka.
4. A total of 14 unions having varied degree of stakes with the project have been identified. Total House Hold of 14 unions is 111,328 Nos. with a population of 478,292 including 247,727 male and 230,56 female.
5. A total of 14 Unions varied degree of stakes with the wetland have been identified. About 12 different primary stakeholder types, who directly extract different resources from the wetland, have been identified. Of them; fishermen, arrotder, lease holder, subsidence user, sand collector are recognized as primary stakeholder. Out of 12 different stake holders; piker, musclemen, local elite person, land encroacher were identified as secondary stakeholder. RMO & FRUG, relevant government agencies, NGO identified as institutional stakeholder.
6. Topographically the landscape comprises, law-lying plains gradually sloping from the north-west to south. This site was once a large depressed area. The higher land surrounding the site is intensively cropped. The Sherpur basin is a part of the Old Brahmaputra floodplain and northern piedmont plains. This area forms the



Kangsha River catchments. Moreover, the main rivers of the Sherpur District,s are Old Bhramaputra, Mirgi, Malijee, Bhogai, Chellashali and Maharashi. The annual average temperature maximum 33.3c, minimum 12c. Annual rainfall 1274 mm.

7. Local people mostly depend on wetland and forest resources for their livelihood. The resource collection activities include fishing, snails, aquatic plants and fruit collection, firewood collection, etc. Besides a group of people are engaged to exploit sands from the rivers and Beels.
8. Agriculture practice includes production of Boro and Amon, pulses of different kinds, vegetables, and few homestead gardening. During winter, irrigation done by low lift pump, and to some extent using river, canal and Beel water.
9. The assessment of professions of the local people includes mainly farmers, fishers, small traders, few service holders, etc. Number of real fishermen is very few comparing to subsistence fishing community. The major primary occupation of project area is agriculture (approx.65- 70%), principally paddy cultivation, followed by day labour including (20-25%), fishermen (30-35%), small business (2-3%), service (3%), and overseas employment (2%).
10. Before MACH Project intervention a number of indigenous fish species were threatened and endangered. Due to successful implementation of appropriate resource management tools (fish sanctuary, habitat restoration, fishing effort control, etc.) a number of disappeared species has been reappeared in the Beel Complex. However, this management practices need to be continued with out any interruption.
11. The Kangsho-Malijee River Basin comprises two main rivers namely Kangsho on south-east and Malijee to the north. Malijee is a Tran's Boundary River originated from Garo Hill Complex. A number of canals crisscrossed the Beel Complex forming a network of Complex Water Area. 26 prominent Beels identified in the Beel Complex of which 5 to 7 are perennial and rest are seasonal.
12. Flash flood occurs mainly from the north ward throuth Malijee River. The water carrying capacity of Malijee River decreased in extensively during last 2 to 3 decades. That results flooding of whole basin. However, flash flood is temporary where water remains for few days.
13. Three public water bodies of the Beel Complex belong to MACH RMOs. There are no identified public water bodies within the project area other than those three as mentioned. Besides RMO members, general people engaged in fishing don't maintain sustainable resource exploitation. As a result, quick depletion of fisheries resources is common phenomenon.

- 14.** A number of Non-Government Organizations (NGO) is functioning in the project area. These organizations are working on micro credit, mass education, health and sanitation & women development etc. It is assessed that good linkages need to be established between IPAC and these organizations for smooth implementation of project activities.
- 15.** The most commonly identified scenario of the locality is degradation of natural resources viz.: wetland and forest resources. Wetlands are mainly degrading because of siltation and agricultural encroachment. Similarly, forest resources are degrading mainly because of deforestation due to expansion of locality, fuel wood collection etc.
- 16.** Fisheries resources are degrading mainly due to over exploitation and indiscriminate fishing by illegal gears. No specific program from government side like habitat restoration, fish sanctuary establishment, fingerling stocking, Fish Act implementation were seen.
- 17.** Finally we can be said that, to revive the natural resources as well as fisheries would be the most prior challenge for IPAC. These can be achieved by bringing down the rate of dependency of the local people on natural resources. To achieve these challenges, introduction of Alternative Livelihood Activities (AIGA) is very much important. The future action plan of IPAC needs to be centered with this message in thinking.

## Acronyms

<b>Acronym</b>	<b>Detailed name</b>
AIGA	Alternate Income Generating Activities
ASA	Association for Social Advancement
BDR	Bangladesh Rifles
BO	Beat Office
BRAC	Bangladesh Rural advancement Committee
BRDB	Bangladesh Rural Development Board
BREB	Bangladesh Rural Electrification Board
CAP	Center for Advancement Program
CBO	Community based Organization
CODEC	Community Development Centre
Dept.	Department
DFO	Divisional Forest Officer
FD	Forest Department
FGD	Focus Group Discussion
Fig.	Figure
FRMP	Forest Resource Management Plan
FSP	Forestry Sector Project
GD	Group Discussion
GO	Government Office
Govt.	Government
HHs	Households
IGA	Income generating Activities
Int.	Interview
IRG	International Resource Group
kg	Kilogram
KI	Key Informant Interview
KM Site	Kangsho-Malijhee Site
LGED	Local Government Engineering Department
MACH	Management of Aquatic Resources through Community Husbandry
Mat.	Material
MP	Member of Parliament
NACOM	Nature Conservation Management
NGO	Non Government Organization
NP	National Park
PA	Protected Area
PDB	Power Development Board
RDS	Rural Development Sangstha
PIDIM	A Bengali named, microfinance organization
PRA	Participatory Rural Appraisal
RDRS	Rangpur Dinajpur Rural Development Society
RO	Range Office
RRA	Rapid Rural Appraisal
SH	Stakeholder
SSS	Society for Social Service
UP	Union Parishad / Upzilla Parishad

# **1. Introduction**

## **1.1 Project Background**

The US government funding agency USAID financed two separate project namely: MACH (Management of Aquatic Ecosystem through Community Husbandry) and NISHORGO respectively with the GOB agency; The Department of Fisheries and Forest Department. The carryover of these two projects will be mainstreamed through Integrated Protected Area Co-management (IPAC) project.

This project follows the successful completion of the MACH Project funded by USAID from 1998 – 2008, to support the Department of Fisheries and local stakeholders in the management of Aquatic Ecosystem through Community Husbandry (MACH). IPAC also continues support provided to the Forest Department Nishorgo Program aimed at promotion the co-management of forest protected areas.

Collaborative management, or co-management, is an approach used by government technical agencies to collaborate with local communities and other stakeholders in the management of designated natural resources like forest ,wetlands etc. To implement a co-management approach, managers engage these local stakeholders through a participatory process that empowers them with a voice and well defined role in decision-making and provides sufficient economic incentives to engage their interest and commitment to the successful achievement of the agreed upon natural resource management objectives.

IPAC is being implemented through the Ministry of Environment and Forest (MoEF), and Ministry of Fisheries and Livestock (MoFL). The primary technical implementing agencies of the Government of Bangladesh are the Forest Department (FD), the Department of Fisheries (DoF) and Department of Environment (DoE).

The principal targeted beneficiaries of IPAC are the men, women and youth of poor rural households living within the landscapes around the targeted protected areas. However, the successful implementation of IPAC will generate benefits for the entire country over the medium and long term.

IPAC is also designed to communicate with and to support the development of a wide range of constituencies with a stake in conservation of natural resources as well as those in a key position of influencing decisions about the use and management of natural resources. This includes political and opinion leaders, religious leaders, university students, journalists, scouts and other youth program participants, tourists and other visitors to protected areas, environmental and conservation organizations as well as corporate leaders and private sector partners.

IPAC project mobilization began in June, 2008, and the project is being launched in November, 2008. IPAC will be implemented over a period of five years, and is schedule to end in June, 2013.

Bangladesh is rich in natural resources especially water and soils. Its freshwater wetlands are among world's most important, harboring hundreds of fish, plants and wildlife and providing a critical habitat for thousands of migratory birds. The productivity of this valuable wetlands has come under increasing pressure as the human population has spiraled, and as forest clearance, drainage for agricultural development and the construction of flood embankments in tandem with over exploitation and pollution has decimated fish stock and other aquatic life, including edible plants harvested by the poor. The consequences have been devastating for millions of fishing households.

“Saving Bangladesh's forest for future Generation” is the principal slogan of Forest Department Nishorgo Program. In recent years Bangladesh's forest have also come under relentless human pressure as its population grows and forest land are converted to agriculture and other land issues. As a result, Bangladesh now has one of the smallest areas and protected and intact forest in the world, and many rural livelihoods that are depended on the continued existence of forests are threatened.

In order to secure these natural resource-based livelihood while improving the socio-economic well-being of rural communities and protection these valuable natural resources and the associated with natural beauty of Bangladesh's wetlands and forests, USAID/Bangladesh is pleased to extend its support to the government of Bangladesh as well as the people of Bangladesh.

## 1.2 Information Needs of IPAC Kangsho-Malijhee Site and Logical Basis for Conducting PRA / RRA

For any project, development or research, information are needed for designing and planning project interventions, setting implementation strategies, evaluation and monitoring of project performance and impact. Information at the initial stages of the project thus helps the project in carrying out its activities effectively and efficiently.

Kangsho-Malijhee Site situated in Jhinaigati and Sadar upazilas of Sherpur district is one of the MACH site that would be carried over through IPAC. It has been emphasized from the beginning that unnecessary and irrelevant information's and data's of IPAC Kangsho-Malijhee Site will be avoided. Rather it will concentrate on collection of relevant information by sing appropriate methodology. Therefore, it was necessary to carefully scrutinize the information needs and determine its relevance to the project objectives and activities.

The generation of information, in principle, is guided by project objectives and goals. The IPAC Kangsho-Malijhee Site is particularly concerned with the establishment of co-management mechanism of wetland resources in one hand and developing a prescription for the technical management of its resources, on the other hand. Therefore, generation of information is thus centered on the characterization of local community (stakeholders) likely to be involved with the project and local resources that are to be managed.

This preliminary assessment of information needs for IPAC Kangsho-Malijhee Site through scooping exercises provided precursors for brainstorming for identifying specific information needs that will be collected through subsequent appraisals. It was thought that at the initial stage of the project a rapid appraisal would be very appropriate in terms of cost effectiveness, usefulness, reliability, and overcoming time constraints.

Rapid Rural Appraisal (RRA) / Participatory Rural Appraisal (PRA) are packages of methods and tools for collection of qualitative information about local people, their life, environment, resources within the landscape, activities and living conditions in a short time. The purpose is to utilize knowledge of the local people in designing and setting implementation strategies of a project/program and /or to monitor and evaluate project performances and impact. It is also considered as a process for involving local people in the project planning and /or implementation and monitoring. In fact, RRA / PRA is thus considered as an integral part in down-top planning process in many development or resource conservation projects.

RRA was carried out as an initial activity in the field with primary focus on stakeholder assessment and also equally intended for generating information that will help to get a sense of range of key issues and challenges that need to be addressed and be better informed on the context (social, economic, ecological) in which the project is likely to intervene.

Built upon the outcome of the RRA, subsequently PRA was planned to collect in depth information on the identified issues and to ensure greater participation of local people in information collection.

### 1.3 Purpose of the Report

The main purpose of the present report is to present a synthesis of all findings from RRA and PRA exercises conducted by the IPAC central Cluster Team in IPAC Kangsho-Malijhee Site during January-February, 2009. The report also details the methodology and tools used and highlight the issues in forest management and biodiversity conservation and identify the challenges for the IPAC Kangsho-Malijhee Site. Finally the report makes suggestions on what the project, Department of Fisheries, Department of Forest and Department of Environment need to do immediately. Finally, the report puts forward set of recommendations for the improved management of the wetland of IPAC Kangsho-Malijhee Site.

## 1.4 Outline of the Report

The site level appraisal report, at first, provides an executive summary which summarizes the entire ranges of the findings, methods used, issues and challenges identified during PRA. The report starts with general introduction in Chapter 1 that includes the background information of the project, information needs of IPAC Kangsho-Malijhee Site and logical basis for conducting PRA / RRA, the purpose of the report etc. A brief description of the site is provided with a site map in Chapter 2.

Chapter 3 sets out the methodology of the study that deals with the approach taken for the implementation of the fieldwork of RRA and PRA, study team and study period, objectives and methodology of the study. The chapter also includes study period, setting RRA and PRA issues and questions, formation of RRA and PRA field teams, selection of RRA and PRA spots, choice of RRA and PRA methods and tools and the limitation of the field work.

Outcomes of the RRA and PRA exercises are described in chapter 4 which contain major findings and analyses. The findings are mainly presented as situational analysis of the forest resources, stakeholder analysis, resource and resource extraction, trend analysis, socio-economical situation of the surrounding area, seasonal trends in resource extraction, etc. In short, this chapter reflects the current status of the forest dynamics with social dynamics.

Chapter 5 presents issues and challenges for IPAC Kangsho-Malijhee Site, an extended section based on PRA / RRA outcomes, identifying present issues of concern and challenges for NSP and highlights the opportunities for the project.

The final Chapter 6 embodies a set of suggestions and recommendations regarding the implementation of the project. At last a number of necessary references of all documents consulted and photographs are appended as annexure with the report.

## 2. Description of the project site

Sherpur District is under Dhaka Division; is bounded by Garo Hills of Meghalayas (India) on the North, Mymensingh and Jamalpur District on the South, Mymensingh District is on the East, Jamalpur District is on the west. There are five upazilas under this district, namely: Jhenigati Upazilla, Nakla Upazilla, Nalitabari Upazilla, Sherpur Sadar Upazilla and Seebardi.

Kangsho-Malijhee Site is situated within Sherpur Sadar and Jhienagati Upazilla under Sherpur District. It covers 14 unions of both upazilla 7 from each. Unions under Sadar upazilla are Pakoria, Bhatshala, Dhola, Bajitkila, Kamaria, Gazir Khamar and Sherpur Pourashaba. and that under Jhienagati upazilla are Malijikhanda, Hatibandha, Jhienagati, Gouripur, Nolkura, Dhainshail and Kangsha. The project area is about 200-240 km north of Dhaka.

Topographically the landscape comprises, low-lying plains gradually sloping from the north-west to south-west. This site was once a large depressed area. The higher land surrounding the site is intensively cropped. The entire floodplain area including the connecting Canals, Streams and Rivers are intensively fished with a diverse varieties of gears. According to the local community there has been massive geo-physical change over last 20 years with rapid and almost complete deforestation of the wetland areas followed by a rapid loss of connectivity due to embankments and increased sedimentation.

The Sherpur basin is a part of the old Brahmaputra floodplain and northern piedmont plains. This area forms the Kangsha River catchments. Moreover, the main rivers of the Sherpur District are old Brahmaputra, Mirgi, Malijhee, Bhogai, Chellashali and Maharashi. The annual average temperature maximum 33.3°C, minimum 12°C. Annual rainfall 1274 mm.

Flood water enters in this area from the Garo / Meghalaya Hills through a number of hill streams those turn eventually and drain out to the Bhugai and onto the Kaligang / Kangsho which is part of the Sylhet Haor Complex of Rivers in different places.

In the upper catchments of the Malijhee River system originated from Tura and Garo Hills of India flow in Bangladesh and join with Dhali Beel complex (9 Beels) near Bagadubi village. The River Bagadubi originated from Dhali Beel complex and join with Mahroshi River which join with Malijhee at Paglar Mukh. Then the Malijhee flows towards south to south-west direction through Tinanibazar under Malijhee Kanda Union. The River ChillaKhali joins with it at Kalaspa Union. The flow ultimately joins with the Bhugai and then the Kangshaw River in the down.

On the way, the River system connects many Canals, lower pockets (Beels) and Rivers which created a good for rich aquatic vegetation, fish, birds and other aquatic biota. The lower pockets (Beels) contain seasonal and perennial Beels rich of aquatic flora and fauna.



People surrounding the resource base largely depend on fishing. Boro rice is widely cultivated at the high and medium low lands of Beels in the dry season. The land is fertile and productivity is satisfactory. However, there is risk of crop damage due to early flash flood and the community is vulnerable with such situation. The area remains under water at least six months in a year during Jaisthya to Kartik (May-October). This is the main cause of manifold problems, the people suffers from income hardness. The community also involved in many other professions. They use to migrate temporarily to other areas for their livelihood.

**Fig. 1: IPAC Kangsho-Malijhee Site**



### 3. Methodology

As mentioned in the preceding section a rapid appraisal strategy was taken. RRA was conducted in the initial stage in the appraisal process, followed by PRA. RRA was carried out as an initial activity in the field with a primary focus on generating information that would help to get a sense of the range of stakeholders, key issues and challenges that need to be addressed and provide information on the context (social, economic, ecological etc.) in which the project will operate. Built upon the outcome of the RRA, a subsequent PRA exercise collected in-depth information on the identified issues and was designed to ensure greater participation of local people in information collection. The overall purpose of the RRA and PRA was to come up with a comprehensive situational analysis of the IPAC Kangsho-Malijhee Site with a view to understand.

- Who destroys and how the wetland resources destroyed?
- Opportunities for improvement in wetland resource management?
- Cause and effects of the behavior of local people?
- What are the underlying driving forces for the forest degradation?
- What kind of stakeholders are involved with wetland resources? Or so on.

#### 3.1 Developing the RRA and PRA: Issues and Methods

As per direction of IPAC's authority, an integrated planning was applied by Central Cluster Team for developing the applicable RRA and PRA method. The type and nature of issues, the research team's accessibility and mobility in the area, the behavior of local people and their rapport with the field staff were all taken into consideration in the design of these methods and tools by the direct field implementation partners (RDRS) and relevant government offices. , who were likely to be involved in the RRA field exercise. These participation to prepare a field protocol, decide and agree on approaches, methods and tools to be used and also to make and consolidate team understanding.

The detailed methodology for these activities was embodied in a manual and used in training workshops with the field teams to give instruction in using the research tools and to ensure that the methodology remained same across the team and across the sites. A one-day training workshop was organized for the PRA and RRA team members on the beginning of the month of January, 2009 with Central Cluster Team.

The RRA was mainly based on unstructured and semi-structured household interviews, KI interviews, group interviews and focus group discussions (FGD). A limited number of other RRA tools were also used like trend analysis, seasonal analysis, sketch mapping etc. The issues and activities covered in the RRA are shown in Table 1.

**Table 1. Selected RRA Issues for IPAC Kangsho-Malijhee Site, Specific Activities and Tools Used**

Sl.	RRA Issues	Specific activities	Tools Used	Participants
1	Stakeholder Assessment	-Identification of settlements, resource users, local institutions and agencies and organization, community organizations etc and their roles and activities	HHs Interview, KI FGD GD Sketch mapping	Local HHs Local school teacher, Doctor Community people (villagers, elites etc) Local community people Local people
2	SH Demographic profile	-- Settlement wise no. of HHs/population HH occupation, education, wetland use, land holding	Secondary Info HH Int., KI, GD, FGD Trend Analysis	Local union parishad HHs heads / members Community people School / College teachers & local public representatives
3	SH Economic Activities/ Livelihood Strategies and Human Capital Development	----- HH primary and secondary income sources of HH Richness/poverty Unemployment and its seasonal trend Credit and alternate income generating opportunities Skill and skill development opportunities	HH Int. GD KI FGD Seasonal Calendar	HHs heads/members Teacher, retired officers, old people Public representative Local elite Community people
4	Gender Issues	-General impression on living standard, education and health status etc. - Participation in decision making (household and PA management) - Women mobility in the area -Access to IGA and credit etc	HH Int. GD FGD KI, Direct observation	HHs heads Women group Community people Local elites RRA team members.
5	Behavior local people of	-Initial response of the local people and DoF staff towards the project -Sources of conflict and conflict resolution	FGD GD HH int.	Local community GO staff HHs heads
6	Local Level Awareness	-Awareness and perceptions about resource degradation and conservation - Willingness for resource conservation - Awareness about the existence sanctuary-knowledge about wetland, aquatic flora and fauna preservation acts	HH int. GD FGD	HHs heads Local community
7	Resources / resource status	-Trend in changes in major resource bases -Endangered / extinct aquatic flora and fauna -Causes for the decline in different resources	Trend analysis, HH int, FGD GD KI	Local people/GO staff Local HHs heads Community people Local educated old,

Sl.	RRA Issues	Specific activities	Tools Used	Participants
8	Resource exploitation	-Major wetland resources collected, Reasons and extent of exploitation of different wetland resources	HH int, FGD, GD	Local HHs heads Public representatives
		-Dependency on the forest/forest products -Seasonal trend in resource exploitation -Future risks -Medicinal plant uses and reason for not using these	KI, Trend analysis, seasonal calendar	Community people Local educated old, Local elite and GO staff, HHs interview and KI
9	Resource regeneration practices	-Stocking status in the locality - Problem with natural regeneration in the wetland	Secondary Information, FGD, GD, KI, Seasonal calendar	Secondary data from GO staff, Community people Local elite, teacher Community people
10	Legal aspects	-Access to the wetland by locals - wetland and land use agreement	FGD	DoF staff and wetland villagers
		-Conflict and negotiation with DoF staff -Land encroachment/recovery -Law enforcement mechanisms in the PA - Illegal tree felling and forest cases	GD KI FGD KI	Local community and local govt. members Local elites DoF staff, community people Teacher, ex-officers,
11	Local leadership	Local influential and their role, local hierarchy Nature and sources of power and their domain of influence Conflict and conflict resolution Social cohesion and --- adhesion	HH int, FGD, GD, KI	Local HHs heads Local community and local govt. Local community Local elites
12	Others	---- Access to areas and settlements NGO activities in the locality Challenges for conservation Local problems Mobility in the area	HH int, FGD, GD, KI	HHs heads Local community and local govt. Local people & DoF staff Local elites

PRA issues and questions were developed by a three-person team of experts on the basis of field experience and outcomes of the RRA exercise. During the PRA, tools like Venn diagramming, resource mapping, seasonal analysis, trend analysis, livelihood analysis etc., were used in addition to interviews, focus groups and more informal discussions. More than one tool was used to research any particular issue to allow the research teams to triangulate the information gathered. The issues and activities performed in the PRA are summarized in Table 2.

**Table 2. PRA Issues, Specific Activities Performed and Tools Used in IPAC Kangsho-Malijhee Site**

Sl.	Issues	Specific activities	Tools used	Participants
1	Wetland make up dynamics	-observation on wetland physiography and topography and wetland make up  -land use cover, resource exploitation and regeneration areas, animal distribution	Transect walk  KI  Resource mapping  Secondary data, FGD, KI	PRA Team  Local elite, DoF staff  DoF staff and village headman, wetland villagers.
		-changes in forest cover, thickness, vegetation, settlements, animals and availability of resources	Trend analysis	Local people and DoF staff, forest villagers
2	Local governance system and community structure and functions	-Decision makers--- influential people --Local community organizations and institutions and their linkages -Local conflict and conflict resolution -Social cohesion and adhesion -Collective action -Local problem, cause and possible solution	Venn diagram Ven diagram Venn diagram  FGD / GD, FGD & GD and Ranking	Community people Community As above  As above and local elite
3	Livelihood strategies	Income and expenditure sources, Livestock, Richness and poverty	Wealth ranking HH interview	Women group and local people
4	Gender issue	-Family decision making  -mobility  -workload  -Education and access to credit	Decision making Chart  Mobility map  Daily and seasonal work chart HHs Int. & FGD	Women group  Women group Women group Women and educated people
5	Wetland resources collection	-Information on collector -purpose and reasons for collection -uses of the resource and extent of extraction -dependence on the extraction and marketing -conflict and negotiation with people over the extraction -alternate source for the resources -needs and expectation of the collector -impact on the forest and future risk for the -seasonal changes and trend in abundance	FGD, GD Seasonal calendar and trend analysis	Wetland resource collector, community, people and GO staff and local people

Each PRA tool was used to collect information about more than one issue, as shown below:

**Venn diagramming:** local power structure, local community organizations, local institutions and agencies, local conflict and conflict resolution, family decision making, mobility of women & men, local NGO / CBOs

**Seasonal calendar:** fish and fish fry, mollusk collection, aquatic weed, unemployment, workload, , agricultural activities, collection of building materials, sand collection, sun-grass extraction.

**Trend analysis:** availability of fish and fisheries items, unemployment, local solvency, land encroachment, settlement/population solvency/income, livelihood expenditure, literacy, unemployment, use of wetland for income, use of forest for HH needs, transportation and mobility, homestead plantation, food scarcity, credit and IGA, occupation

**Ranking and scoring:** local problem ranking, wealth ranking, and livelihood analysis

**Transect walk:** Soil, vegetation, land use, elevation, crops, aquatic flora and fauna, human activities etc

Forest resource mapping: forest land use cover, resource zones, resource exploitation zones, animal distribution, settlements.

## 3.2 Fieldwork Preparation

### *3.2.1. Selection of RRA and PRA Sites*

On the basis of information provided by local DoF staff and the field implementing NGO (RDRS), various sample locations were selected for the purpose of information collection. These locations are hence called RRA and PRA spots. The selection of locations was based on a number of selection criteria. The selection process was completed during planning workshop. While the number of sites visited during the RRA was limited, the team focused on gaining an overview of issues covering the whole of wetland area. However, because of the size and geographical location of the project site, it became clear there would have to be a trade off between the size of the study area and the depth and quality of the information collected. Therefore, a decision was made that the PRA would focus on only issues and stakeholders relating to the management of wetland within the wetland. A list of the selected RRA and PRA spots for IPAC Kangsho-Malijhee Site is given in Tables 3 and 4.

**Table 3. List of Selected RRA Spots & Schedule for Visits**

Date	Name of spots (villages) visited		Remarks
	Villages	Location	
05.02.09	Orientation and briefing session on RRA field exercise at Cluster Office, Modhupur		Team build up
13.02.09	Dholi Baila RMO	Doli, Kalinagor, Jhenaighati	within 1 km distance from of the wetland
14.02.09	Takimari Darabashia RMO	Jolgao, Malijikhanda, Jhenaighati	close of a wetland and canal
15.02.09	Bailsha Beel RMO	Uttar Khanduli, Dhanshai, Jhenaighati	several wetlands situated surrounding the RMO
16.02.09	Kewta Beel RMO	Bakerkhanda, Pakuria, Sherpur	several wetlands situated surrounding the RMO

**Table 4. PRA Schedule, Spots and PRA Activities in IPAC Kangsho-Malijhee Site**

Date	Village/ Location	Performed activities	Remarks
22.02.09	Dholi Baila RMO	GD(1), HH interview(3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
	Doli, Kalinagor Jhenaighati	GD (1), HH interview (3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
24.02.09	Takimari Darabashia RMO	GD (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
	Jolgao, Malijikhanda, Jhenaighati	GD (1), KI (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. KI with local UP member, Social Mapping with local people
26.02.09	Bailsha Beel RMO	FGD (1), KI (1), HH interview (4) Social Mapping	FGD with forest villagers, KI with head man of wetland village, HH with female group
	Uttar Khanduli, Dhanshai, Jhenaighati	FGD(1) wetland resource mapping, Transect work	FGD with DoF staff, wetland resource mapping, Transect walk with wetland villagers and DoF Staff
28.02.09	Kewta Beel RMO	GD (1)	GD with Villagers
	Bakerkhanda, Pakuria, Sherpur	GD (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI



### *3.2.2 Formation of RRA and PRA Field Teams*

The RRA field teams were formed with representatives from Worldfish Center, RDRS and DoF, local staff, having biological and sociological background. The teams make up for the RRA and PRA field exercises are provided in the table 5 and 6. During RRA two separate RRA field teams were formed, each team consisting of 4-5 members. And during PRA, three separate PRA field teams were formed, each team consisting of 2 members. The teams worked simultaneously in the field, but at different locations.

**Table 5. RRA Team of IPAC Kangsho-Malijhee Site**

<b>Name</b>	<b>Organization</b>
Masood Siddique	IPAC-Worldfish Centre
Shital Kumar Nath	IPAC-RDRS Bangladesh
Shariful Islam	IPAC-RDRS Bangladesh
ABM Shahidul Hoque	IPAC-RDRS Bangladesh
Lutmon Edmond Podhuna	IPAC-RDRS Bangladesh

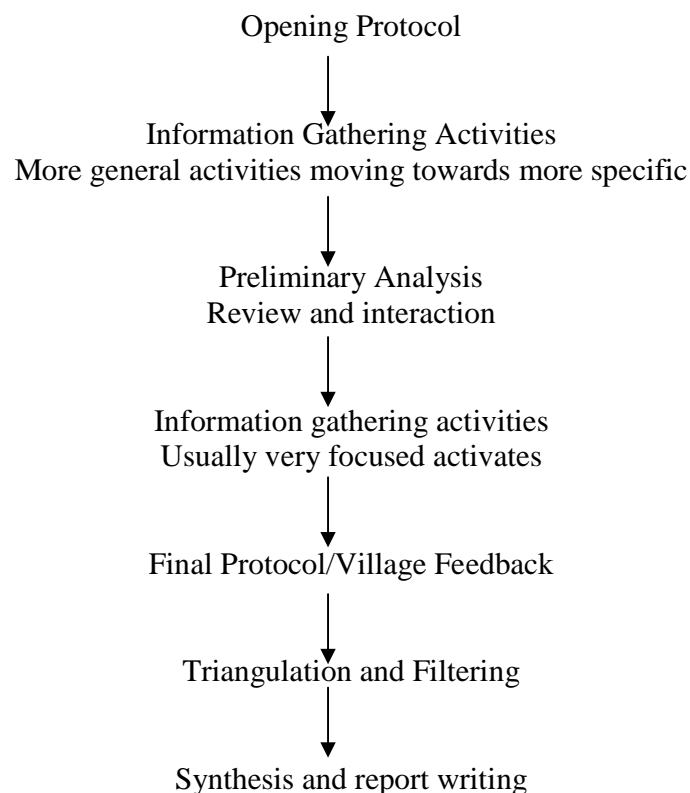
The RRA and PRA field exercise and finalize were conducted between 15<sup>th</sup> and 28<sup>th</sup> February 2009.

### 3.3 Field Implementation Strategies

#### 3.3.1. Organization of the RRA and PRA field work

The organization of field exercises involved a series of logical steps. The field teams always made efforts to adhere to those steps. The flow of activities is shown in the following flow chart.

Fig. 2. Flow of RRA/PRA Field Activities (3-4 days)



During RRA exercise, a total of 20 HHs interviews, 4 group interviews, 4 key informant Interviews, and 2 Focus group discussions were conducted. The other RRA tools were applied during above mentioned interviews and discussions. Similarly, during PRA a total of HH 22 interviews, 4 Group interviews and 2 focus group discussions, 2 key informant interviews were conducted. This is summarized in Table-6.

**Table 6. Summary of Activities in IPAC Kangsho-Malijhee Site during PRA & RRA at a Glance.**

Appraisal	FGD	GD	KI Interview	HH Interview	Transect	Resource and Social mapping
PRA	2	4	2	22	4	4
RRA	2	4	4	20	4	4

The other PRA tools were used either during the above exercise or in separate exercises dedicated for this purpose. Further details on the implementation of the fieldwork methods used are provided below.

### *3.3.2 Household (HH) interview*

- Individual/HH interviews were conducted with randomly selected interviewees, typically visiting one household at each stop.
- Both male and female respondents were considered.
- Typical HH interview last for about 1 hr – 1:30 hr
- The interviewees were not treated as respondents to a questionnaire, but active participants in an unstructured/semi-structured interview. A checklist of issues was used as a basis for questions, not necessarily addressing all questions in each interview and sometimes departing from basic questions to pursue interesting, unexpected or new information, relevant to the project and situation.

### *3.3.3 Key informant (KI) interview*

Key informants are local people who have extensive knowledge on the local environment, situation and events. The purpose of this interview was to utilize them in collecting information from them relevant to the project needs.

KI interview was by prior appointment. A local guide helped in making appointment with the KI. The interview was taken by paying visit to Key informant HH or by inviting him to the team base

- A preliminary discussion with local DoF staff, IPAC Field partner staffs and interview of local people gave adequate clue for selecting KI. Preferably local schoolteachers, retired officials, local elites or local public representatives would be selected as the KI.
- A typical KI interview lasted for about 1.5 hrs. The entire team took part in the interview taking session
- As with HH interview, a similar checklist of questions was used for the purpose of KI interview.

### *3.3.4 Group interview*

- The purpose of the planned Group Interviews was to collect some information on the locality and local situation based on the consensus of the local people.
- Interviews were conducted at places, preferably at local tea stalls, road junctions and other local community places, where local people gathered spontaneously. No formal invitation to the local people was made for participating at the group interview.
- Mapping, seasonality, ranking and scoring exercises, whenever possible, were done in such group interviews.
- Typically a group interview lasted for about 1-1.5 hrs
- At least one group interview was held each day
- This was basically an unstructured interview and a checklist of issues was used as a basis for questions

### *3.3.5 Focus Group Discussion*

Focus Group Discussions were carried out with different professional groups, resource user groups, local public and government representatives with a view to collect information on specific areas.

During PRA, FGDs were principally conducted with different stakeholder groups, mainly with local DoF staff, wetland villagers, local public representatives etc.

- The FGDs were conducted by invitation and a local guide was used to invite the people.
- Senior project personnel /or senior personnel from the partner NGO /and or senior DoF Official and/or experts were usually present in the FGD sessions.

### *3.3.6 Other PRA tools*

Other PRA tools were either incorporated into the interview and discussion processes outlined above or carried out through separate exercises dedicated for this purpose. Resource mapping, Venn diagramming, seasonal calendaring, trend analysis, ranking, scoring etc. were done usually in separate sessions dedicated to these activities. However, sometimes, these exercises were also performed during group, focus group and key informant interviews. The participants were either invited local people or local people instantly gathered at places.

### *3.3.7 Direct Observation*

The team while walking through the project area, talked to local people, discussed many things and made observation on the resources, people's behavior and their activities, etc. These observations and informal discussions helped to triangulate collected information and generate new questions for interview or discussions.

### *3.3.8 Secondary Information Collection*

Some demographic data was collected from the relevant local Union Parishad sources. The report on secondary information collection collected from previous MACH project, whenever necessary.

### *3.3.9. Reflection and Analysis*

After each day of fieldwork, the team sat together for about 1 ½ hours for team interaction and triangulation. The activities performed during the session included:

Reviewed information gathered that day and made summary of the information, triangulated whenever necessary. The person designated for report writing took note of discussions

Planned the next day's activities

Methodological review

### *3.3.10 Triangulation and filtering*

A single information may be collected by using several tools or from several sources. The team cross-checked their results and accepted the most logical analysis. During these feedback sessions and subsequent data analysis, team members were required to use their own judgment to ensure the most reliable analysis of the situation.

## **3.4 Limitations of the Fieldwork**

The main limitation of the field work was that it took place during the paddy cultivation period. This made working conditions difficult, and in particular meant that the traditional PRA approach of participants working together to complete large scale matrices on the ground was impossible, and researchers recorded information in note form and by completing matrices themselves either during the group discussion or afterwards. Therefore this work does not match the usual requirements of a PRA where information is analysed and owned by the participants. During the paddy and vegetable cultivation period most of the local people were engaged cultivation field. So, gathering for data collection was not smoothing process.

IPAC ପ୍ରକଳ୍ପ ଖେରପୁର ମାନ୍ୟ  
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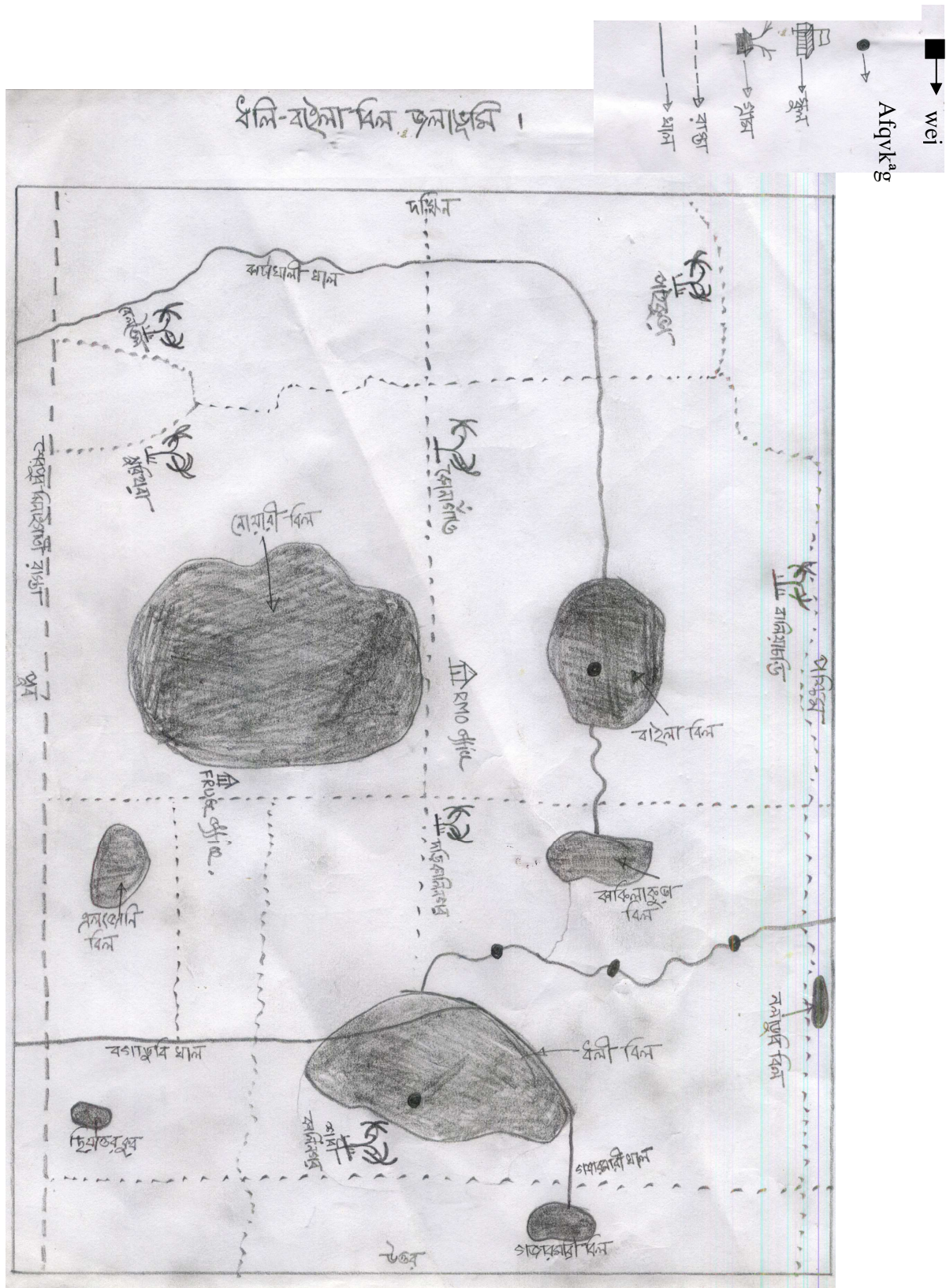


PRA / RRA Report of K-M Site, Sherpur





Fig.4:Dholi-Baila Beel Complex of K-M Site,Jhinaigati, Sherpur (Prepared by local community)





## 4. Outcomes

### 4.1. Status and Trend in the IPAC Kangsho-Malijhee Site

The present project area is spreaded over in two upazilas of Sherpur district, namely: Sherpur Sadar and Jhenaigati. Almost all the landscape area is located within flash flood zone. Flash flood water mainly flows from northward hilly areas of neighboring country (Meghalaya, India). The Kangsho-Malijhee river basin is criss-crossed by many canals and tributaries. These canals are very much flashy during monsoon. They connect all the Beels and floodplains within the project areas with the rivers namely Malijhee, Challakhali and Bugai. These canal networks are the migratory route and spawning ground of indigenous fishes. At present most of the canals are silted up due to agricultural and homestead encroachment. Loss of water carrying capacity of nearby rivers, tributaries and canals also another cause of siltation. A total of 26 Beels of different sizes have been identified within the existing project area (Table 7).

**Table 7: Resource Management Organization Information**

Sl no.	RMO Name	Total Member	Meeting Date	Leader Name	Location	Beel Name
01	Kewta RMO	73 (M=60,F=13)	04 no. GB meeting /year and 08 no. EC meeting / year	President:Abdul Mannan Munshi Secretary:Shahabuddin Casier:Nurul Islam	Bakar Kanda Pakuria , Sherpur	01.Kewta Beel 02.Neti Beel 03.Durungi Beel 04.Moinari Beel
02	Takimari Darabashia RMO	87 (M=60, F=27)	04 no. GB meeting / year and 08 no. EC meeting / year	President:Azizur Rahman Secretary:Abdur Razzak Casier: Abul Kashem	Jolgao, Malijhi Kanda, Jhenaigati	01.Takimari 02.Darabashia 03.Barbari 04.Berbon 05.Khata Khali Khal 06.Charalia 07.Batia 08.Malijhee River 09. Dainar Kur
03	Doli Baila RMO	114 (M=90,F=24)	04 no. GB meeting / year and 08 no. EC meeting / year	President:Tota Mia Secretary: Hasmot Ali Casier:Kismot Ali	Dolikhali Nagar , Jhenaigati	01.Doli beel 02.Baila Beel 03.Boga Dubi Khal 04.Kakila Kuri Beel 05.Tenachura Khal 06. Alangjani Beel 07.Noari Beel 08. Jogar Mari Beel
04.	Bailsha Beel RMO	106 (M=76,F=30)	04 no. GB meeting will be held in one year and 08 no. GB meeting will be held in one year	President:Shamsul Haque Secretary: Sultan Ahmed Casier: Mohijul Haque	Uttor Kanduli Danshail, Jhenaigati	01.Bailsha beel 02.Sonaikuri Beel 03.Gojarmari Beel 04.Tenachura Khal

N.B.: Out of the above list there are 5 Beels, which are not maintained by any RMO.

At present; most of the Beels are perennial. It can be mentioned that before MACH Project's activity most of the Beels were seasonal. There are 23 fish sanctuary established within 8 Beels of different location of the project area (Table 8) during MACH Project intervention. Out of 26 Beels only 5-7 Beels are perennials. Major as reported by the local people about 25 – 20 years-back most of the Beels were perennials. Beels were well inter-connected by the internal canal networks. During the study, detail information of 20 Beels collected. Water retention period of seasonal Beels usually 6-8 months; however, in some Beels water remains for a period of 9-10 months a year.

**Table 8: List of Beel wise sanctuary of KM Site**

Sl No.	Name of Beel	Number of sanctuary	Maintenance by	Location of upazila
01	Batia Beel	01	Takimari-Derabashia Beel RMO	Jhenaigati
02	Dainnar Kur	01	Takimari-Derabashia Beel RMO	Jhenaigati
03	Khatakhali Khal	05	Takimari-Derabashia Beel RMO	Jhenaigati
04	Doli Beel	01	Doli-Baila Beel RMO	Jhenaigati
05	Tenachura Khal	03	Doli-Baila Beel RMO	Jhenaigati
06	Baila Beel	06	Doli-Baila Beel RMO	Jhenaigati
07	Bailsha Beel	02	Bailsha Beel RMO	Jhenaigati
08	Kewta Beel	04	Kewta Beel RMO	Sherpur Sadar

There are three Beels in the project area, which leased out for every five years, but it required renewal for each year, namely: Kaowta Beel, Dholi-Baila Beel and Dairnar Kur. Kaowta Beel is situated at Chandernagar & Tinghariapara, Dahala Union; which maintained by Kaowta RMO by leasing money Tk. 1900 (one thousand nine hundred) only per year. Dholi-Baila Beel is situated at Dolikalinagor, Jhenaigati, which maintained by Dhli-Baila Beel RMO by leasing money Tk. 7,800 (seven thousand eight hundred) only per year. Dairnar Kur is situated at Malijikhanda, Malijikhanda Union; which maintained by Takimari-Dharabasia RMO by leasing money Tk. 130 (one hundred thirty) only per year.

There is no restriction on fishing by the subsistence fisher for family consumption. For commercial fishing the share and tool arrangements are varied based on fishing gears and units as well as water bodies. There are number of Kurs (Duar / Kum) in the rivers and canals. These are managed and harvest by the local people (mainly elite). However, sharing of fishing among the fishermen is 50-50 basis.

At present farmers mainly cultivate Boro and Aman. In the past, most of the Beels were perennials, only Boro crops cultivated at the fringe areas of Beels. Now, in the fringe areas framers cultivate two crops mainly Boro and Aman and also they use these areas for seed bed.

Vegetable and wheat cultivation observed in few crop lands. As reported by the local people there are need for forestation.

vicinity Area under Boro HYV is increasing day by day. The farmers use mainly ground water for irrigation through shallow tube well. The local people reported that they don't have any problem with the ground water. However they are facing crisis for lack of surface water availability in the dry season. They also mentioned that within 15-20 years the dry season water crisis would be severe.

A rubber dam has installed in the Bhugai River. It is about 5-6 km from Nalitabari Upazila head quarter. The main purpose of the dam is to provide surface water irrigation to the Boro fields of the both sides of the rivers.

BWDB has installed one sluice gate in the river Bogai at Simultali to provide irrigation water in the dry season. BWDB also constructed embankments in both sides of the river Challakhali.

The bench mark study of MACH project shows that 12 native fish species were nearly endangered at that time (2000-01). At present these species are reappeared in low abundance. Table 9 shows a brief of present status:

**Table 9: Information about Fishing Ground and gears, water retention period, & fish species of low abundance**

Union	Villages in the vicinity	Fishing Ground	Water Retention period	Gears used	Species found in Low abundance
Pourashava	- Purba Tatalpur	<b>Beel</b> : Aoura Boura Beell	Round the year	Thela jal, Chai/Borung, Dhrama/Chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal	Shol, Gajar, Pabda/Pabu, Dhaisha, Fali
Kamaria	- Tarakandi Utaarpara	<b>Beel</b> : Kamaria, Gajaria, Baka, Kaowta, Pekua <b>Khal</b> : kamaria, Tarakandi	Round the year	Thela jal, Chai, Borshi Dhrama/Chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal	Shol, Gajar, Pabda/Pabu, Dhaisha/Meni, Fali, Vangra, Chital, Khalisha,
Pakuria	- Fakirpara - TarafgharBekirpar - Khamarpara - Pakuria Purbapara	<b>Beel</b> :Goawa, Beki, Rouha, Duringi, Neti, Kaitari, Moynari <b>Khal</b> : Manda, Kamaria	Jaistha-Chaitra	Thela jal, Chai, Borshi Dhrama/Chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal, Koch, Hatani	Shol, Gajar, Pabda/Pabu, <b>Dhaisha/Meni, Fali</b> , Chela
Bajitkhila	- East Kumri	<b>Beel</b> : Tilkuri <b>Khal</b> : Lokai	Jaistha-Falgun	Thela jal, Chai, Borshi Dhrama/Chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal	Shol, Gajar, Pabda/Pabu, Dhaisha/Meni, Fali
Dhala	- Chandernagar Tinghariapara	<b>Beel</b> : Bouli, Baitrachara, Dubla, Biri	Jaistha-Chaitra	Thela jal, Chai, Pain, Kai, Dhrama/Chip jal,	Shol, Gajar, Pabda/Pabu, Dhaisha, Fali, Vangra

Union	Villages in the vicinity	Fishing Ground	Water Retention period	Gears used	Species found in Low abundance
				Musuri /Karcha/Ber jal, Current jal, Jhakijal	
Gajirkhamar	- Gajaria	<b>Beel :</b> Nijala, Chua, Khailla, Kea, kasti, Paikha	Ashar-Falgun	Thela jal, Chai, Dhrama/chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal	Shol, Gajar, Pabda/Pabu, Dhaisha, Fali, Boal, Koi, Kalibous, Shing, Magur
Malijhikanda	- JolgaonPuschimpara - Malijhikanda TinaniPara - Hasli gaon Madha Para - Hasli gaon West Para - Hasli gaon North Para -Hasli gaon South Para	<b>Beel :</b> Halia, Hasli, Darabashia, Berbon, Charalia, Ververi, Takmari <b>Khal :</b> Dhahala <b>River :</b> Katakhal	Jaistha-Chaitra	Thela jal, Chai, Kathi, Dhrama/Chip jal, Musuri /Karcha/Ber jal, Current jal, Jhakijal, Koch, Borshi, Bana, Pollo, Puti jal, Penti.	Shol, Gajar, Pabda/Pabu, Dhaisha, Fali, Bataia, Golsha, Kalibous

Note : Information collected through from FGD in several villages of all project covered area

It can be mention that, Beki is dried up in Falgun & Chitra; Rouha, Durungi, Tilkuri, Nijala, Hasli is dried up in Chitra. Charalia is dried up in dry season at that time it comes in area about 150 acres.

Fishing was restricted to real fishers only 2-3 decades before. But as population increases, subsistence fishing gradually suppressed the real fishers' activities. Almost all the rural households depend on subsistence fishing for their daily consumption. As a result fishing pressure increased tremendously.

## 4. 2 Settlements

A total of 14 unions having varied degree of stakes with the project have been identified. Total House Hold of 14 unions is 1,11,328 Nos. with a population of 4,78,292 including 2,47,727 male and 2,30,56 female (Table 10).

**Table 10. Shows the location of the identified union / villages within project site of two upazillas.**

Name of the Upazilla	Name of the Union	Total HHs	Total population	Male	Female
Jhinaigati	Malijikhanda	5,377 Nos.	22,178	11,349	10,829
	Hatibanda	3,822 Nos.	15,326	7,729	7,597
	Jhinaigati	24,276 Nos.	111,191	58,457	52,734
	Gouripur	3,953 Nos.	15,998	8,110	7,888
	Nolkura	5,787 Nos.	24,986	12,518	12,468
	Dhainshail	4,961 Nos.	20,885	10,640	10,245
	Kangsha	5,759 Nos.	24,446	12,458	11,988
Sherpur	Pakoria	8,812 Nos.	36,104	18,575	17,529
	Bhatshala	7,240 Nos.	29,427	15,389	14,038
	Dhola	4,601 Nos.	18,370	9,373	8,997
	Bajitkila	5,172 Nos.	22,056	11,550	10,506
	Kamaria	8,475 Nos.	33,323	17,207	16,116
	Gazir Khamar	5,164 Nos.	21,823	11,090	10,733
	Sherpur Pourashaba	17,929 Nos.	82,179	43,282	38,897
	<b>Total</b>	<b>1,11,328Nos.</b>	<b>478,292</b>	<b>247,727</b>	<b>230,565</b>

Source: Census 2001, Local Statistical Bureau Office, Sherpur Sadar, Sherpur

## 4.3 Stakeholder Assessment

At least 3 categories of stakeholder could be recognized in IPAC Kangsho-Malijhee Site, such as

- Primary stakeholder- involved with direct extraction of resources from the wetland or their activities directly affect the wetland
- Secondary stakeholders – indirectly linked with the wetland, involved with trading or exert influences on the wetland
- Institutional stakeholder- involved with developmental activities and administration of the adjoining areas

### 4.3.1 Primary Stakeholders (SH)

Table 11 provides information on stakeholder type & category, stakeholder description, their activities, dependency, relative level of stakes with the wetland and their impact on the wetland resources. About 5 different primary stakeholder types, who directly extract different resources from the wetland, have been identified. Of them; **fishermen, arotder, lease holder, subsidence user, sand collector** are recognized as primary stakeholder.

### 4.3.2 Secondary Stakeholders

Out of 12 different stake holders; piker, musclemen, local elite person, land encroacher as secondary stakeholder.

### 4.3.3 Institutional Stakeholders

Out of 12 different stake holders; RMO & FRUG, relevant government institutions, NGO as institutional stakeholder

**Table 11. Stakeholders Information**

Sl. No.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level of stake	Remarks
01	Fisherman	Direct/primary	Poor and living Beel surrounding area	Fishing practices legal and illegal	Livelihood full depend	Major	They detrimentally destroy fish biodiversity
02	Piker (fish collector from fishermen)	Secondary	Medium to higher , in and out side of the wetland	Purchase fish form local fishermen	Livelihood dependent	Medium	They patronize the fishermen to over fishing practices
03	Arotder / Mohajon (money investor)	Direct/Primary,	Rich, in and out side of the wetland	Purchase fish form local fishermen	Livelihood dependent	Medium	They patronize the fishermen to over fishing practices
04	Lease holder	Primary	Richmen, in and out of the wetland	They play negative role to wetland management	Indirect	Minor	They destroy biodiversity in various ways
05	Subsistence user	Direct/primary,	Poor to medium	They play negative role to wetland management	Direct	Major	They destroy biodiversity in various ways
06	Sand collector	Primary	In and out side the project are, they employ local poor people for sand collection	They play negative and positive role	Direct	Major	They hampered ecological balance
07	Musclemen	Indirect/Secondary	Individual/ Group	Have a good link with illegal collection of fishermen	Direct	Major	They destroy biodiversity in various ways

Sl. No.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level of stake	Remarks
08	Local elite person	Secondary	Individual / Group	They play positive role	Negligible	Minor	They aware the local people to conserve the biodiversity
09	Land encroacher	Secondary	Individual / Group	They play negative role	Direct	Major	They encroach <i>Khash</i> Land and so fish habitat decreasing
10	RMO and FRUG	Institutional	Group	They play strong positive role	Indirect	Major	They protect and improvement wetland ecosystem
11	Relevant Government Institution	Institutional	Group	They play positive role	Indirect	Major	They protect and improvement wetland ecosystem and having more scopes
12	NGO	Institutional	Group	They play positive role	Indirect	Major	They protect and improvement wetland ecosystem and having more scopes



## 4.4 Problems, Causes, Effect, Solutions for the declined wetland resources

### 4.4.1 Problems of wetland resources

Summaries of problems of project areas of wetland's resources can be mentioned as follows which:

- Fish abundance
- Fish disease
- **Use of destructive Fishing Gears and catching fish fries**
- Lack of any Fish Sanctuary
- Decreased in Aquatic natural resources in the Beels
- Diminished natural resources (Aquatic Weed reed) like, Shapla, Shalook, Bhet, Kalmi, Pawta, Singra etc. in Beels
- Decreased in the abundance of migratory Birds
- Fuel scarcity, No trees at the side by the Beels
- Siltation of Beel, Flood damages crops, Beel become dry-up, Beels coming silted up due to the erosion of MANDAs dykes
- Link Canals silted Connected Khal,
- Lack of employment opportunities
- Lack of Bullocks for plough, lack of cattleheads and Poultry, lack Fishing gears, lack Shallow Machine, lack of cash capital, lack of land, lack credit facilities and lack of daily laborage scope.
- **Common Fishers loosing access in the Beel due to the private MANDA's occupying major part of Beels, etc.**

### 4.4.2 Causes of wetland resources

Summarizes causes of project areas wetland resources can be mentioned as follows:

- Catching fish fry
- Unemployment situation prevails during Jaistya to Kartik
- Non availability of brood fish
- Deadly diseases of Fish
- Siltation of Khal and Beels and dries up once in dry season
- Lack of Aquatic Weeds and natural fodders
- **Beel water lifting for irrigation**
- **De-watering of MANDAs**
- **Catch of Brood-fish**
- **Frequent use of Current-Jal and Mashery-Jal (Fine mesh)**
- **Use of chemical fertilizer and pesticide in rice field**
- Pollution of water
- Diminishing water depth level / inadequate water depth level
- Lost connectedness of water bodies
- **Use of Mashery-jal (Fine mesh) and Current-jal.**
- Harvest of Aquatic Weed Reeds as fodder
- Dries up of Beel/Khal in the dry season
- Degradation of birds habitat

- Birds hunting / trapping
- Fishing by de-watering of Beels
- Over harvesting of resources/over Fishing increased population
- Collecting of Shapla, Shalook as food substitute
- Collection of Weed, Reeds as house making materials
- Unplanned rural infrastructure set up
- Deposition of sediment coming with run offs
- Beel bed raising by dumping of earth cut by farmers for leveling the Beel adjacent land for expansion of rice field
- Soil erosion of MANDAs Dykes
- Soil erosion of its banks
- Sedimentation by run off
- Decreases in the abundance of Fish
- Beels being silted up
- Landless ness / selling out of resources
- Decreases of abundance of Plants, trees and other natural resources
- Lack of scope of employment
- Less opportunity of alternative income generation
- Illegally occupies Khash land and make MANDAs
- Fisher and poor people have no land in the Beel, etc.

#### **4.4.3 Effect due to causes of wetland resources**

Effects due to causes of wetland resources can be summaries as follows:

- Catches of small fries much in number but less in weight
- Fish crisis in the market
- Lack protein intake
- Raises Fish price
- Decreased in daily income and savings of Fisher
- Decreased in Fish export
- Problem in carrying social entertainment cost
- Decreases in the abundance of natural Fish food
- Decreases in the abundance of natural cattle fodder
- Increases in human food shortage
- Increases in the pest attack on crops
- Breaks out Fish diseases
- Diminishing income of laborers
- Decreases in Fish production
- Hinders Poultry raising activities
- Decreasing in the resting places / shelters for those are working in the field both of rice and Fishing
- Hampers the natural balance
- Fish not available there round the year
- Damage of Aquatic Plants
- Less farm production/lack of irrigation water
- Decreasing in the cattle fodder

- Decrease in the Fish production
- Increase in the human food shortages
- Beel becomes dries up
- Navigation been interrupted
- Hampers water movement
- Causing water congestion
- Water becomes polluted
- Dearth of sufficient irrigation water
- Catching Fish excessively
- Decreased in income/daily laborage
- People suffers from food deficiency
- Farm land remain untilled sometimes due to lack of Bullocks
- Faces difficulties in carrying cost for treatment
- Faces difficulties in carrying social/festival/marital cost
- Faces difficulties in carrying social/festival/marital cost
- Faces difficulties in carrying educational expenses for children
- Faces difficulties in carrying the households/house maintenance cost.
- Increased the pressure on catching Brood-fish and fries
- Don't have Fish for consumption
- Common people/subsistence are compelled to buy Fish in the market
- Decreased in the amount of catch by Fisher
- Brood-fish and fries can't survive.

For the among reasons ultimate groups of local people are farmers, fishers, day laborers, women, landless poorer and service holders, businessmen, etc.

#### **4.4.4 Solution of the causes of wetland resources**

Solutions of mentioned causes of wetland resources can be summaries as follows:

- Use big mesh/wider mesh net (Jal)
- **Stop small fry catch**
- **Enforce Fish conservation act/regulations appropriately**
- **Enhance/raise community awareness**
- Re-excavate Kewta and Durungi Beels (Khash land is there)
- Stop use of Mashery (Fine mesh) Jal and Current-jal
- Re-introduce of some species like, Daishya, Shol, Gazer, Foli
- Establish Fish Sanctuary
- Take water treatment measures, use Potassium, Lime and other water purifying substance.
- Stop Fishing participatory in Baishakh
- Reduce use of Chemo fertilizer and pesticide
- Limit Fishing pressure

## **4.5 Local Community and Power Structure and Local Governance**

### ***4.5.1 Local decision makers and influential people***

Various types of influential persons have been identified in the locality and many of them have control over the local people, their activities and even over local administration. Some of them have linkages with the illegal fishing.

### ***4.5.2 Local governance***

Local Union Parishad is the lower level local government entity and look after local welfare and development. It has also emerged as the main center for conflict resolution. The UP members, who are elected from different areas of the Union, look after their respective areas. The local public representatives are consulted whenever there is a local issue. There is also a new local organization. Police administration at Upazila level is the local law enforcing agency and are involved with maintaining local law and order situation.

### ***4.5.3 Local conflict, conflict resolution, social adhesion and cohesion***

#### **4.5.3.1 Sources of conflict**

The main sources of conflict among local people are, fishing, land dispute, children affairs, livestock grazing, marriage related affairs, family affairs, money lending, local politics, local elections etc.

#### **4.5.3.2 Conflict resolution**

Conflicts are resolved by arbitration by local elites & public representatives (MP, UP chairman, members), RMO and FRUG. If the local efforts are not fruitful it may lead to filing cases with Thana-police and ending up in courts.

### ***4.5.4. Social cohesion and adhesion***

There are many social activities that maintain social adhesion and cohesion among the villagers. Some of them are Eid ul Azha, Eid ul Fitre, marriage ceremony, religious functions, collective action through local community organizations, etc.

## **4.6 Local Socio-economic Context**

### ***4.6.1 Demographic Profile***

#### **4.6.1.1 HHs**

In total, there are approximately **1,11,328Nos.** (Table ) in the identified villages having major and medium level stakes. Information regarding households for some villages was not collected.

#### **4.6.1.2 Education**

It may be mentioned that extrapolation of data was made based on limited data collected through RRA exercises. Now-a-day's 80-85% children go to primary school, only 60%

go to High School and only 25-30% study in the colleges. Among the adult, about 35-40% are literate (above 30 years of age).

## 4.7 Livelihood analysis

### 4.7.1 Occupation

The major primary occupation of project area is agriculture (approx.65- 70%), principally paddy cultivation, followed by day labour including (20-25%), fishermen (30-35%), small business (2-3%), service (3%), and overseas employment (2%).

### 4.7.2 Richness-poverty level

Table 24 shows that about 4-5% people of the area are rich, 22-25% are middle class and 55-60% is poor and 17-20% is very poor.

### 4.7.3 Unemployment

Unemployment is another severe problem that puts pressure on over exploitation of wetland resources. In the project area, on an average, about 20-25% people are unemployed. Among the villagers, about 5-7% people are unemployed. In average, about 15% local surrounding people are unemployed. However, there is a strong seasonal trend in unemployment level in the area. Unemployment is a major concern/problem in the area. According to the local people, the number of unemployed people increase during the dry season..

### 4.7.4 Credit

Several NGOs, FRUGs and banks provide micro-credit to local people. Bank loans are mainly given for poverty reduction and integrated rural development through creating opportunity of IGA and also as seed money for agriculture and handicraft. NGOs provide credit mainly for IGA. NGO's IGA programs concentrate on small business, fish culture, poultry, livestock rearing etc (Table 12). NGO credits are mainly focused on women. It was seen that local people also take credit locally from neighbors, relatives etc.

**Table 12. List of NGO/Banks operating around the IPAC K-M Site activities**

Sl. No.	Name of NGO / Bank	Activities
01	BRAC	Micro credit, edecation, health, awareness, poultry & livestock development
02	ASA	Micro credit
03	BRDB	Micro credit, training, etc.
04	Bangladesh Krishi Bank	Loan for agriculture
05	FHD	Micro credit
06	Grmeen Bank	Micro credit
07	PASA	Micro credit
08	SSS	Micro credit, livestock
09	SPS	Micro credit

Sl. No.	Name of NGO / Bank	Activities
10	World Vision	Health care, charity, etc.
11	Sunity Sanghta	Micro credit
12	PDIM	Livestock
13	RDS	Micro credit
14	CAP	Micro credit
15	RASDO	Health care
16	SHOUHARDO / CARE	Livelihood
17	FRUG	Micro credit program support to IGA

#### **4.7.5 Income and expenditure profile**

FGD revealed that the major sources of income in order of magnitudes are laborer, followed by agriculture, fuel wood collection, timber poaching, small business, etc. On the other hand, the expenditure profile shows that people spend major part of their income for purchasing food, followed by meeting, cultivation expenses, clothing purpose, less for educational purpose.

#### **4.7.6 Skill & skill development opportunities**

Overall in the area, the number of skilled person seems to be very inadequate to undertake alternate generation activities. Skill development training provided by the NGOs are very limited and confined to some traditional areas of income generation. Local people, have got some skills, like bamboo basket and mat making, etc. There are areas such as bamboo and cane handicrafts preparation, cattle fattening, poultry, dairy, pond aquaculture etc. Potential training and credit support in these areas could play a vital role in income generation of some of the local people and lessen their dependency on wetland and at the same time very soft loan would help in undertaking these activities.

### **4.8 Social dynamics (Trend in changes in socioeconomics)**

#### **4.8.1 General Dynamics**

Table 13 shows the changes in some key socio-economic factors and local activities. Compared to 1970, there has been an increasing population; the expenditure of local people has increased with corresponding decline in solvency. Income of local people in terms of taka has increased, but at the same time livelihood expenditures have increased. Although, literacy rate has increased, unemployment rates have also increased. During this time, use of the wetland for both as HH needs and income has increased. However, local food scarcity has reduced while opportunities for alternate income have increased.

**Table 13. Trend in Changes in Some Socio-Economic Matrices of the Local People**

Issue	Pre-1971	15 years ago	Present	Causes for change
Population	00	000	00000	Population growth,
Solvency	00000	0000	000	Livelihood expenditure increased, lack of added income and unemployment
Livelihood expenditure	00	000	00000	Increased price of goods, use of increased commodity
Literacy	0	000	00000	Awareness raising, educational opportunity increased
Unemployment	0	00	00000	Less cultivated land than pre- 1971, population growth, resource depletion
Use of wetland for income	00	000	00000	Poverty, unemployment
Use of wetland for HH needs	00	000	00000	Poverty, Population growth, easy access and no alternate source
Transportation and mobility	00	000	00000	Development of communication and transport road
Homestead plantation	0	00	0000	For income generation, consumption, awareness HHs
Food scarcity	00000	000	00	Increased opportunity development and employment agricultural
Credit and IGA	-	-	00	Increased GO, NGOs credit and IGA programs
Occupation	0	00	00000	Increment of IGA and business

#### *4.8.2 Seasonal changes in socio-economics of the local People*

While there appears to be no direct link between seasonal unemployment and dependence on the wetland resources, this is thought to be a causal factor in dependence. In flash flood most of fishermen are engaged to their general phenomenon, but in the dry season most of them become unemployment. Specially, at that time, they need AIG support to save the wetland resources in various ways.

#### **4.9 Local Problems**

Problem ranking exercise (Table 14) was performed to identify and understand the local level problems and its causal factors. The major problems, according to the magnitude, are poverty, unemployment, road communication, electricity, drinking water, etc.

**Table 14: Local problem and their causes and possible solutions**

Name of Problems	Reason	Solutions
Poverty	Over population, unemployment, lack of capital to initiate IGA, lack of alternative income generating activities, lack of skills.	Creation of opportunities for new IGA and providing of credit without interest, skill dev. training, more NGO activities
Unemployment	Lack of sufficient work, population pressure, Lack of education,	----- do-----
Education	There is no sufficient educational institution	Establishment of new technical & NFE schools, awareness, and financial support
Road communication	Road communication is not well in some area, most of the case, become difficult during rainy season	Local government and other concern agencies should give proper attention
Drinking water	Lack of deep tube well and fresh water	Need Government and NGO efforts to provide tub well and technology for safe water.
Electricity	Limited & interrupted electricity supply that hampers public life.	Electricity should be supplied through REB or PDB or introduce solar energy system

A collation of problem rankings carried out during the PRA showed that poverty is cause for the use of wetland (Table 15).

**Table 15. Pair wise Ranking of Some Local Problems**

Identified problems	Poverty	Unemployment	Food security	Income needs	Fuelwood scarcity	Scarcity of house build. mat
<b>Poverty</b>	-----	Poverty	Poverty	Poverty	Poverty	Poverty
<b>Unemployment</b>	Poverty	---	unemployment	Income needs	unemployment	unemployment
<b>Food security</b>	poverty	unemployment	-----	Income need	Food security	Food security
<b>Income needs</b>	poverty	Income needs	Income needs	-----	Income needs	Income needs
<b>Scarcity of. H. build mat.</b>	poverty	unemployment	House build. mat	Income needs	House build. mat	-----
<b>Total</b>	10	06	02	08	01	03
<b>Rank</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>4</b>



## **4.10 Gender Issue**

### ***4.10.1 HH decision making***

In generally, most of the families, husband takes the major HH decisions, while female opinion ignored due to lack of empowerment.

### ***4.10.2 Outdoor mobility and access to credit and IGA***

The women of the area have moderate mobility. Participation to social events by women is comparatively less than males. But in the cases of IGA & credit, the women have much higher access than the man. The cause behind this is that the credit providing organizations or NGOs prefers female than to male for providing credit. Women are moderately discriminated in case of employment in jobs, business etc.

### ***4.10.3 Workload of Local Male & Female***

Generally, the in the community, men have more work during Jaistha to Bhadra and again during the winter months. The females have more work during the dry months and the periods that correspond to the local agricultural activities. In general, women in the locality have a lower workload than the men.

### ***4.10.4 Daily work load***

The females are typically involved with the household work and also help in the and outdoor work. The males mainly do the outdoor works related to income generation.

### ***4.10.5. Education***

The overall literacy rates of male and females are near to close. In recent years, the number of school going girls is higher than the boys. However, in case of higher studies girls are behind the boys. Overall, females are less educated than the males. Overall, higher education is very less in the area, and the females are far behind in this respect.

## **4.11 Local Level Awareness and Behaviour**

Local people know about some of the rules of Fisheries Acts, but most of them do not know the significance of these acts. They have a positive attitude towards conservation. Initial response of the local people and DoF staff towards the project is very positive and villagers are willing to cooperate.

## **4.12 Resource Regeneration & Plantation Practices**

### ***4.12.1 Plantation***

Al ready there are some Social Forestry have developed on the road side and Beel & Cannel's embankment. The Social Forestry is mainly maintained by the administration of Local Government, Co-management Committee with the collaboration of RMO. The species of Social Forestry are Mehogoni, Akasmoni, Arjun, Hisol, Karach, etc.

## **5. Threats, Issues, Opportunities and Challenges for the IPAC Kangsho-Malijhee Site**

### **5.1 Threats to the IPAC Kangsho-Malijhee Site and its Biodiversity**

#### ***5.1.1. Siltation of Beels***

The geographical location of Kangsho-Malijhee site is as such where run off water come with huge silt, especially at the commencement of monsoon. Flood water in these areas comes from the Garo / Meghalaya Hills through a number of hilly streams and eventually drains out through the Bhugai river and into the Kaligonga / Kangsho which is the part of the Sylhet Haor Complex. Thus huge silts settle in beel basin and adjacent canals. It damages crops. Indirect effect of siltation Beels becomes dried up. Beels becoming silted due to erosion of MANDAs dyke also. Local people also mentioned that river bank erosion is comparatively more than that of the past.

#### ***5.1.2 Link Canal silted***

Due to siltation process most of canals have silted up. Silting process blocked the current of water flow and in course of time criss-crossed canals loses connectivity. According to the local community there has been massive change over last 20 years with and almost complete deforestation of the wetland areas followed by a rapid loss of connectivity due to embankments and increased sedimentation.

#### ***5.1.3 Using Insecticides in agricultural field***

Similar common practices of other part of, Bangladesh huge amount of insecticides used in project area, specially during Amon and Boro season, which is very harmful for flora and fauna of wetland biodiversity.

#### ***5.1.4 Irrigation***

During dry season, irrigation is common practice in project area. Most of time, people dried up the MANDAs. Therefore this poses a threat to the wetland biodiversity within the project area as their population is now reduced.

#### ***5.1.5 Use of destructive fishing gears***

Most of the local people are not aware of using fishing gears as per Fish Act. Most common gears are current jal (Gill net under 4.5 cm), mosquito net, Seine net with fine mesh size, khora jal (lifting gear), etc. Implementation of fish act is very seldom.

#### ***5.1.6. Extensive fishing pressure***

Finding no other alternative options for livelihood the poor fishers and ultra poor section of the community are compelled to overfish. Day by day, per unit fishing effort is increasing due to meet the demand of increasing population. Both unemployment and population are increasing parallel and so illiterate employment persons of the project area do not find alternative income source rather than traditional income. So, fish habitat decreasing but fishing effort increasing.

### 5.1.7 Lose of habitat

Effect of above threats causes most of the Perennial Beels to become seasonal Beels and Seasonal Beels have have disappeared. Finally it becomes paddy or other crop's field. Due to loss of habitat, 12 indigenous fish species already are now in Critically Endangered Condition (Table ?). The local people mentioned that in the past all those species were abundantly available. Another example of habitat of loss is that no winter birds now a day are seen since last few couple of years.

## 5.2 Issues of Concern

The following are the major problems that need to be addressed in order to sustainable management of the IPAC Kangsho-Malijhee Site:

**5.2.1 Conserving aquatic biodiversity:** Mainly caused due to over and indiscriminate fishing, habitat lost, etc. Conservation and enhancement of aquatic biodiversity would have to be a priority work for IPAC.

**5.2.2 Unsustainable resource exploitation:** Mainly include harvesting at each stages of life cycle of fish from fingerling to adult fish and all aquatic flora and fauna of wildlife etc. Thus causing depletion in biodiversity. IPAC needs to address this issue.

**5.2.3 Local dependence on wetland resources:** Almost all HHs (mainly fishermen community) and many HHs from nearby settlements depend on fishing; Collection of other aquatic animals like snails, freshwater bivalves also too high. Using water for irrigation is also too much intensive. Excessive dependency on wetland by local people causing harm to biodiversity. Thus this emerges as an issue of concern for the project.

**5.2.4 Poor wetland management by the DoF, DoE and lack of specific Management Action Plan:** As became apparent from the appraisal process that the wetland is poorly managed by the DoF and DoE, primarily due to lack of adequate and skilled man power for wetland management, lack of logistics and incentives. But some Beel of kangsho-Malijhee site are under better management with the collaboration of DoF, and RMOs of MACH project. Most importantly, there area variety of scope to improve management action plans for the Kangsha-Malijhee site and therefore these are important issues for consideration.

**5.2.5 Local poverty and unemployment:** Local poverty and unemployment have been identified as the driving forces for the illegal wetland use by the local people. Unless the problem is reduced it is unlikely to achieve success in the implementation of the project and therefore draws particular attention for addressing the issue.

**5.2.6 Lack of awareness among local people about biodiversity conservation:** There is serious lack in understanding about benefit of biodiversity conservation and need for sustainable management of wetland resources among the local people. It seems that enhance local level awareness would help in the successful implementation the project interventions.

**5.2.7 Poor law enforcement for wetland conservation:** Wetland patrol is inadequate to check illegal fishing. Help from the other local law enforcing agencies is not adequate; rather the activity of local police is not conducive to wetland protection and encourages the illegal capturing.

**5.2.8 Changes in the landscape:** Land erosion, land leaser, different types of cultivation practice, siltation, sedimentation, etc. brought a change in the original landscapes and its associated elements.

### 5.3 Challenges for the Project

The possible challenges for the project are:

- **Reducing use of destructive fishing gears, using chemical, fertilizer & insecticides:** People are not aware about the negative impact on using destructive fishing gears, unplanned use of chemicals and insecticides in the crop fields. They even don't know how these practices causing fatal effect on aquatic biodiversity and fish production. IPAC would have to take the challenge to aware local community on these issues.
- **Reducing local poverty and unemployment:** Unless this issue not addressed the illegal use of wetland resources will continue. However, though it may be a difficult job even than project should address this issue with great importance.
- **Revising Existing Leasing Policy:** This is a policy issue. However, opinions and recommendation from field would have to be documented and proposed to the higher authority for policy reformation.
- **Establishing co-management regimes for biodiversity conservation:** Approach for resource management by involving stakeholders at different tiers is new in the country. It will be a huge task for the project to bring the parties, particularly the local community on board and facilitate them to be organized.

### 5.4 Opportunities

- **Positive responsiveness of the local people:** The general people showed interest to the project. This positive attitude of local people can be utilized to ensure their participation in the project and thus will help in establishing co-management.
- **Ecotourism development:** A large number of people visit Gajni (under Jhinaighati Upazilla), Modhutila (under Nalitabari Upazilla), etc that lies to the north of project area. Here the scope of establishing facilities for Eco-Tourism is very feasible. IPAC can come forward to introduce Eco-Tourism practice within these localities.
- **Plantations:** There are plenty of opportunities for plantation like on road side, embankment of canals and Beels, etc. Another scope for plantation within Beels to reintroducing Hijol, Karach, etc. By this type of plantation the wetland habitat will automatically be restored.

- **Scope for alternate income generation activities:** There are good scopes to undertake various AIG activities, such as basket making, handicraft making, cultivation, nursery, poultry, cattle fattening, weaving, fish culture etc. The raw materials for such AIGA are easily available within the locality. This will help to reduce dependency on wetland uses.
- **Habitat restoration and rehabilitation:** By excavation/re-excavation of degraded Beels and canals, stocking indigenous endangered species, fish sanctuary, proper plantation and Fish Act implementation within project area the habitat can be restored.

## **6. Recommendations and Suggestions**

### **Administrative**

**6.1** Poor wetland management by the DoF, DoE and Land Ministry has been identified as one of the major reasons for wetland degradation. Strengthening and capacity building of local concern authorities' engaged in wetland management would have to be a prior area that IPAC can address. Following supports and activities would be required to achieve this target

- Adequate staffs for the local DOF and DoE offices. As at this moment there is no chance to set revenue staffs from GoB side, therefore, field worker can be provided from project side. At the same time this issue can be highlighted in PA strategy with importance and advocacy can be given to the concern ministry and departments to increase staffs;
- Capacity building training in wetland management and community development required for the local GoB staffs;
- Logistic support for the local concern offices like motor cycle; mechanized/country boats and other necessary equipments can be provided from project;
- Developing and strengthening linkage among RMO/FRUGs and local government;
- Enforcing fish acts and rules;
  
- Provision for providing incentives to local staff to make the job lucrative
- Steps for improving the morale of local staff and make them dedicated to biodiversity conservation
- Provision for strong monitoring and supervision of local activities by a central cell and the cell will take any necessary participatory decision by the consulting of scientific and technical point of view

### **Technical Management**

**6.2** An appropriate, site specific and technically sound management Action Plan should be developed with consultation of local people. The action plan, among others, should have the following provisions:

- a plan of action for re-introduction and rehabilitation of endangered biotic species
- a plan of action for habitat restoration and rehabilitation
- a plan of action for protection and sustainable use of wetland resources and biodiversity
- a long-term biodiversity monitoring plan aiming at changes in the biodiversity in the wetland; not only targeting to measure the changes impacted due to project activities but also to identify post project situations.

**Some specific suggestions:**

- i.** Catching fish from sanctuaries and respective buffer zone must be prohibited;
- ii.** Introduction of endangered indigenous fish species;
- iii.** Short-rotational plantations with exotic trees should gradually be replaced with indigenous species for social forestry.
- iv.** Considering local dependence on the wetland resources, mainly, sustainable use of some resources local people should be allowed without destructive gears some spot for fishing which are out of restricted area.
- v.** Subsistence collection should be stopped on a short term basis, but this may not be a success as long as there is a scarcity of its supplies in the area. However, once the stock is recovered it may be possible to exploit the resources on the basis of principle of sustainable use.
- vi.** Promotion of fuel efficient stoves in the locality for improves the environment.
- vii.** Promotion of homestead plantations for improving the environment.
- viii.** Arranging alternative livelihood sources for local poor resource users.

**Project activities targeted to local stakeholders**

**6.3** Poor resource users, particularly those who are dependent on the wetland for their livelihood, should be identified and brought under AIG programs with provision that they give up the unsustainable use of wetlands/forest resources. The possible AIG opportunities include, homestead gardening, dairy and fish culture, poultry etc.

**6.4** Attempts should be made to bring the local elites on board with the concept of wetland protection. In particular, the project needs to consult local public representatives, including local Chairmen and Members of Upazila/Union parishad and MP, and involve them, at least in advisory role. The project should also work with existing local community organizations identified under the appraisals.

**6.5** Awareness raising activities should be carried out on a priority basis in the area to make the people understand how they could benefit from this project

**6.6** Planned eco-tourism may be promoted in and around the wetland with provision for generating local funds for wetland management and welfare of the local people.

**6.7** The project should make an effort to negotiate with local development partners/agencies to extend their social welfare services to the area.

**6.8** The project should also make provisions for generating a scientific and social knowledge base about the wetland resources.

**6.9** Immediately a comprehensive faunal and floral inventory should be made. Investigations into the threatened categories of flora and fauna should be made on a priority basis and a management scheme for their protection and rehabilitation should be developed.

**6.10** Awareness campaign groups at local level can be developed by involving Boys Scouts, BNCC, School/College students who will conduct street drama; pot songs on sustainable use of wetland/forest resources.

**Annexure – 1**  
**Summary Activities (Pictorial description)**



**RMO/FRUG Members: Preparing Resource Map, Dholi-Baila Beel Complex, Jhinaigati, Sherpur**



**RMO / FRUG Members: Preparing Resource Map, Takimari-Darabasia Complex, Jhinaigati, Sherpur**





**RMO/FRUG Members: Preparing Resource Map, Takimari-Darabasia Complex, Jhinaigati, Sherpur**



**Meeting with community people along with local Fisheries Officials**





**Fingerling Releasing Program of MACH Project in Dholi-Baila Beel (Picture collected from UFO, Jhinaigati, Sherpur.**



**Selling of Panifall: One kind of aquatic fruit abundantly available in K-M Beel complex which is an important income source of local poor resource collector.**





**Fish Sanctuary: Established by RMO, Dholi-Baila Beel**



**Destroying Current Jal by Takimari-Darabasia RMO and FRUG members along with MACH partner CNRS officials**

## **Annexure-2**

### **Checklist of questions of RRA for FGD, KI and HHs interview**

#### **a. Checklist of questions for FGD**

##### **I. Stakeholder Assessment**

1. People come from where to collect wetland resources? Please indicate its location on the map.
2. What are the different categories of people who collect different resources from the wetland?
3. At what extent the local people depend on the resources they collect from the wetland for their livelihood, please specify for each category of resource users group?
4. What are the local organizations/institutions which are involved with the development /management of the wetland or its control or its resource exploitation/ and or degradation? What are the activities of these institutions/ organizations?
5. Please indicate how the different resource users and other stakeholder groups interact with each other or inter-linked with each other.

##### **II. Resources and resource status**

6. Which plants and animals have disappeared from the wetland ecosystem in the recent past?
7. Which plants and animals in the wetland have been declining very rapidly?
8. What are the causes for the decline of these animals and plants? -Ven diagramming
9. What are the major shifts in the abundance of various resources over time? Compare between pre-liberation and present status? ---Trend analysis

##### **III. Power structure and local conflict**

10. What are the sources of conflict among local people?---Ven diagramming
11. Whom do the local people go for conflict resolution?
12. How the local conflicts are resolved?
13. What are the events that bring the local people together?----Ven diagramming

##### **IV. Resource exploitation**

14. What are the various resources that are collected from the wetland and who collect what? Please indicate on the format. ---use format
15. Exploitation of which resources is posing threat to its future availability?
16. Please indicate how exploitation of different resources varies with different seasons? ----- Seasonal analysis
17. Which animals and plants are collected more and which are collected less?
18. When there is scarcity of fuel wood in the locality and indicate how it varies with season? –Seasonal calendar
19. Do the local people collect medicinal plants from the wetland? Are they available now a day?

## **V. Demographic profile**

20. What are major occupations of the people of the locality? Please rank them.
21. Are there many illiterate people in the locality? Do many people go to High school, college, and universities? Please rank them and indicate on the format
22. Do you think that the occupations of people in the locality have changed over past (30-50 years)? Please indicate the shift in occupation local people over time?  
Format, in which occupation the shifting have occurred (Trend analysis).

## **VI. Socio-economic activities/livelihood strategies**

23. What are the major activities for earning of the local people and rank them according to their importance?
24. Are there many people who have no land?
25. Are there many people in the locality who have no work to do?
26. Please indicate how the availability of work changes with seasons?
27. What the local people do when there is less or no work for them to do
28. Do many people in the locality take loan from, bank NGO or other organizations and please mention the reasons for taking loans?
29. Do the local people get income generation training from various organizations?

## **VII. Gender issues**

30. How do the roles of men and women differ in this community?
31. What are the different thing men and women do concerning wetland products?
  - a. Does the male and female are equally educated in the locality?
  - b. Who take the decision for HH purchase, undertaking income generation activities etc. - male or female?
  - c. Do the females have access to loan and IGA as the male have?
  - d. Is the female are associated with forest management?
  - e. Please indicate on the format, what daily works are done by the male and what daily works are done by the female?----- Chart

## **IX. Others**

32. What are major the NGOs operating in the locality? Please indicate their activities on the format.
33. What are major challenges for the conservation of wetland resources?

## **b. Checklist of questions for Key Informant (KI) interview**

### **Stakeholders Assessment**

1. What are the organizations/institutions, which carry out any type, work in the wetland?
2. What are the villages from where people come to wetland for collecting resources?  
Please tell which villages are more involved and which are less involved?
3. What are the different categories/groups of people who go and collect various resources from the wetland?
4. Who are the other people who do not use wetland resources but have linkages with resource exploitation and development of the wetland?
5. Are there any people who can be important for the conservation of the wetland and its resources?

### **Power structure and local conflict**

6. Who are the more influential people in your locality? Tell who more and who are less influential among them
7. What are the sources of conflict among local people?
8. Whom do the local people go for conflict resolution?
9. How the local conflicts are resolved?
10. What are the events that bring the local people together?
11. Have the local people any conflicts with DoF & DoE? If yes, what are those?

### **Resources and resource status**

12. Which plants and animals have disappeared from the wetland in the recent past?
13. Which plants and animals in the wetland have been declining very rapidly?
14. What are the causes for the decline of various animals and plants?

### **Resource exploitation and dependency on wetland**

15. What are the various resources that are collected from the wetland? Which are collected more and which is less?
16. What are the reasons for collection of these resources?
17. Which category/group of resource users are dependent on the collection of these resources?
18. What proportion of HHs benefit from the wetland?
19. Collection of which resources likely to pose a threat to those resources/availability in the future?
20. Do people collect and use medicinal plant from the wetland?

### **Demographic profile**

21. How many households are living in this community/thana? How many adults?
22. What are the major occupations of the local people?
23. What proportion of local people are illiterate and what proportion of people have read up to school, colleges and above?

24. How the occupations of people have in the locality have changed over past (30-50 years)?

**Socio-economic activities/livelihood strategies**

25. What are the major activities for earning of the local people?  
26. What proportions of local people are very poor (have food shortage), poor, middle class and rich?  
27. Are there many unemployed in the locality? What proportion?  
28. In which season(s) there is scarcity of work in the locality?  
29. From which source the local people take credit?  
30. What are the different organizations, which operate credit in the locality?  
31. Do many people in the locality take loan from , bank NGO or other organizations  
32. Have the local people skills that can be utilized for undertaking alternate income generation?  
33. Is there any work/economic opportunity that requires special skill that the local people don't have?

**Legal aspects**

34. Can anybody can go to the wetland and collect any thing?  
35. Is there illegal fishing? Is it at large scale?  
36. What are the main reasons for wetland resource collection?  
37. Is there any issue of wetland encroachment? What are problem with recovery of these land?

**Gender issues**

38. Does the male and female are equally educated in the locality?  
39. Who take the decision for HH purchase, undertaking income generation activities etc. - male or female?  
40. Do the females have access to loan and alternate income generating activities as the male do have?

**Others:**

41. What are the major threats to the wetland habitat and its resources?  
42. What would be major challenges for the conservation of biodiversity and restoration of its habitat?

### **C. Checklist of questions for HH interview**

1. Govt. has plans to preserve the wetland biodiversity and to improve the socioeconomic condition of the people ---- what do you think (Actually team will gave a statement on the purpose of their visit and on the project)
2. Do you know that the wetland is a fish sanctuary?
3. Do you know what are allowed and not allowed to do in the sanctuary?
4. Do you think that the wetland resources should be preserved/ conserved?

#### **Stakeholders**

5. What are the villages from where people come to wetland for collecting resources?  
Please tell which villages more involved and which are less involved?
6. What are the various groups of people who collect different types of resources from the wetland?
7. Who are the people who do not use wetland resources but are involved with the wetland or has control over the wetland?
8. What are the organizations/institutions which carry out any type of work in the Wetland?

#### **Resources and resource status**

9. Which plants and animals have disappeared from the wetland in the recent past?
10. Which plants and animals in the wetland have been declining very rapidly?
11. What are the causes for the decline of these animals and plants?

#### **Resource exploitation and dependency on forest**

12. What sorts of things do you use from this wetland?
13. Does your household collect it/them, or do you obtain from someone else?
14. If yes, do you collect those for selling or for consumption?
15. Of those things you get from the wetland, which ones won't be available in 5 or 10 years?
16. Do you use medicinal plants from the wetland?

#### **Power structure and local conflict**

17. Who are the more influential people in your locality?  
Tell who are more and who are less influential among them
18. What are the sources of conflict among local people?
19. Whom do you go for conflict resolution?
20. How the local conflicts are resolved?
21. Have you or your neighbors any conflict with forest department? If yes, what are those?



**Demographic profile**

22. What is your primary and secondary occupation?
23. How many people in your HH are educated up to School, how many in the colleges and above and how many are illiterate?

**Socio-economic activities/livelihood strategies**

24. What is your HH primary and secondary source of income?
25. Do you have land of your own (home stead/agricultural)?
26. Is your HH income adequate to meet your family expenditure or you having surplus?
27. Have many people in the locality no work?
28. Have you work to do in all seasons? In which season/seasons people of the locality have little/no work?
29. What do you do when you have no work opportunities locally?
30. Have you taken loan from, bank NGO or other organizations? Was it easy to get the loan?
31. What are the different organizations, which operate credit in the locality?
32. Have you any skill to do a particular work but you don't do? Why don't you do it?

**Resource regeneration practices**

33. Are there many plant nurseries in the locality?

**Legal aspects**

34. Can anybody can go to the wetland and collect any thing?
35. Do you know that there is tree poaching in the wetland? If yes, from where they come (villages)?
36. Do you think that the Department of Fisheries and Department of Environment people are protecting the wetland resources?

### **Annexure-3 PRA issues**

PRA will build upon the RRA findings and is intended for collecting in depth information on the identified issues.

#### **Understanding the wetland make up and dynamics**

**Transect map :** Necessary for understanding the present wetland physiography and topography. A few transects across the wetland will give an idea on overall make up of the wetland. This exercise will also provide the opportunity for learning about the historical trend in changes in the forest make up in different areas of the wetland. It will also provide the opportunity to learn many thing about the wetland while walk with a key informant.

The transect map should indicate

- land elevation (high/low)
- land cover/use pattern (trees / bush / grassland / agricultural land/marshy land etc.).
- A similar transect map should be drawn based on the condition of the wetland 30-40 years back.
- Should carry GPS to track the transect walk / take coordinate reading at intervals
- Should be accompanied by a key informant and learn about the changes over time in the wetland

**Trend analysis in wetland dynamics:** changes with time of the following: wetland areas, abundance of wetland resources, population

**Resource maps (wetland):** Helps in the understanding the distribution, concentration of different major resources of the wetland, resource exploitation and regeneration areas. Also will show

- internal walkways, footpath trails, access roads
- encroached land areas
- rural area
- areas for plantation, agricultural and other resource regeneration
- areas for major resource exploitation
- distribution of various resources

#### **Understanding local governance system and community structure and functions**

- decision makers--- influential people
- hierarchy set up
- local community organizations and institutions and their linkages
- local conflict and conflict resolution
- social cohesion and adhesion (which brings them together)
- collective action