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Site-Level Field Appraisal for Forest Co-management: IPAC Madhupur Site





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Prepared for: International Resource Group (IRG)

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PRA / RRA Report of IPAC Madhupur Site

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Executive Summary

1. Rapid Appraisal through PRA was conducted to make a comprehensive situational analysis of the IPAC Madhupur site during January to mid April 2009, aiming at helping to shape the future activities for the improved management within IPAC Project. Specifically, the appraisals focused on identifying major stakeholders, understanding reasons for the forest degradation and its underlying facts, identifying the challenges for the project and exploring the opportunities for its improved 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 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 Madhupur Site during January to mid of April 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 Madhupur 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 forest of Madhupur Site.

3. IPAC Madhupur Site situated in three Upazillas namely; Madhupur, Muktagacha and Fulbaria. Madhupur is under Tangail District, Dhaka Division. Muktagacha and Fulbaria Upazilla are under Mymenshing District, Dhaka Division. IPAC Madhupur Site is situated within Madhupur, Muktagacha and Fulbaria. IPAC Madhupur Site covers 7 unions of these three upazillas; 3 from Madhupur Upazilla, Muktagacha and Fulbaria have 2 unions each. Unions under Madhupur are Aushnara, Auronkhola and Sholakuri. Unions under Muktagacha are Ghoga and Dhowgow. Unions under Fulbaria are Nowgow and Rangamatia. The project area is about 125 km north of Dhaka on Dhaka-Mymenshing Road. The park lies between 24°30′ to 24°50′ north latitude and 90° to 90°10′ south longitude. The annual average temperature ranges; maximum 33.3°c & minimum 12°c. Average annual rail-fall is 1274 mm.

4. The forest area of the project site divided into 5 Ranges and 12 Beats. Administratively major parts of the Madhupur National Park are under Tangail Forest Division and a small portion is under Mymenshing Forest Division.

5. Although considererable forest loss has occurred at IPAC Madhupur Site in recent years, the site still represents an important and treasured part of the biological as well as cultural diversity of Bangladesh. Members of the Garo (Mandi) community are living in this area for over a hundred years of time. Some of Garo ethnic community resides within the boundaries of the declared Madhupur National Park. During the Liberation War, Freedom Fighters used the surrounding Sal Forests as base areas. The Park established in 1982. The Guest House (Dhokla Guest House) is renowned as the site of the drafting of

the Wildlife Act of 1973. Father of the nation, the then Prime Minister Bangabandhu Shiiekh Mujibur Rahman stayed in this guest house for three days in 1973 and instructed to protect Madhupur Shal forest as an heritage with great importance. With in IPAC Madhupur Site, Madhupur Shal forest declared as National Park (NP) in 1982, though the proposal for the same raise in the year 1962.

6. Topographically the landscape comprises mainly plain land with some area covered by forest. This site was once a largely dense forest area. The type of forest is deciduous with a mixture of evergreen forest. However, evergreen forest area is negligible. The main species of the forest is Shal / Gajari <u>(Shorea robusta)</u>. Total identified plant species number is 176. There are 4 Rubber Gardens / States with in IPAC Madhupur Site, namely Pirgacha Rubber Garden, Chandpur Rubber Garden, Sontoshpur Rubber Garden, and Kamalapur Rubber Garden. The 4 gardens contain total 7,314 acres of land. On average, 200 numbers of rubber trees are in per acre. So, the estimative number of rubber trees is 1462,800 Nos. The plantation started form 1987, which is a leasing land from Forest Department. Duration of every leasing period is 40 years. Identified faunal species included 4 amphibians, 7 reptiles, 11 mammals, and 38 birds.

7. The Bongshai River, flowing through IPAC Madhupur Site in the southern side of the forest. The Bongshai is a part of the old Brahmaputra. Finally, the Bongshai meet with the River Turag. Land surrounding the site and few patches within the forest is intensively cropped. The entire area including the connecting Canals, Streams and Rivers are intensively fished with a diverse variety 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 forest area as well as only river Bongshai followed by a rapid loss of connectivity due to encroachment and increased sedimentation.

8. A total of 187 villages having varied degree of stakes with the forest have been identified. The villages belongs to115 Moujas of 7 Unions. Total project area is 309.98 Sq. Km. Total Household of 187 villages is 71051 Nos. with population of 236368 including 120543 male and 115825 female.

9. There 21 different type of stakeholders have been identified within the project area. About 15 different primary stakeholder types, who directly extract different resources from the forest have been identified. Of them; Moholder, Illegal tree feller, collector of fuel-wood, honey, bamboo & cane, sun-grass, fruits, hunter or trapper, vegetable, medicinal plant, pineapple, banana, lemon, house building materials as primary stakeholder. Out of 21 stakeholders; Sawmill owner and operator, Furniture ownership, Brick field owner as secondary stakeholders. Out of 21 stakeholders; Relevant Government Institutions, NGOs, Institute of Ethnic people as institutional stakeholders.

10. Several NGOs and banks provide micro-credit to local people. About 20 NGO involved in the project area. 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.

Women's are mainly focused on NGO credit programs. Some of these organizations are also working on mass education, health and sanitation & women development etc. It was seen that local people also take credit locally from neighbors, relatives and sometimes from Mohajons (Money Lender) etc. It is assessed that good linkages need to be established between IPAC and these organizations for smooth implementation of project activities.

11. There are 32 Non-Government High and Junior High Schools, 52 Government Primary Schools, 40 Registered Primary Schools, more than 64 Madrashas and more than 161 Moktabs in the project area. Inhabitance of the project area consist different types of ethnic and religious groups, where the Muslims are the majority. The religious institutions within the project area are: Mosque 455 Nos., Temple 33 Nos. and Church 45 Nos. The community facilities within the project area are average comparing to the other part of the Bangladesh. There are 7 Hospitals, 34 Community Clinics, and 63 Hats / Bazars with in the project area.

12. The scenario of a limited portion of the project area consists a number of Furniture shops, Insecticide' and Hormone shop, Sawmill, and Brickfield which are highly unfriendly for environment and ecosystem. There are about 28 furniture shops in the project area from Kakraid, Pirojpur, Jalchatra, Pochismile to Sholakuri. Many of them have no valid license for trading of timber. They usually receive sawed timber from sawmills and trade locally. It is alleged that they sometimes receive illegally felled timber from thieves and get sawed and sell it and thus help in the illegal felling of timber. There are about 26 insecticide and hormone shops in the project area from Kakraid, Pirojpur, Jalchatra, Pochis Mile to Sholakuri. Out of this list, most of the local small business shop sale insecticides and hormone. There are about 05 sawmills in the project area from Charaljani, Brittibari to Pirojpur. Also there are a number of temporary sawmill found in the forest area. All these sawmill are to some extent involved in illegal tree felling. There are about 03 brickfields in the project area from Charaljani. Most of these brick-fields use forest woods as fuel. There are about 33 timber traders in a limited area of the project area from Kakaid, Pirojpur, Jalchatra, Pochish Mile to Sholakuri who are involved with timber trading. Timber traders working scenario is same as above.

13. A number of fuel wood traders have been identified that have indirect stakes with the Madhupur Forest, collected fuel-wood from the local direct collectors. There are about 22 fuel-wood traders at Charljani to Sholakuri Bazaar. Several trucks of fuel-wood is transported everyday from this area and majority of which come from clear felling and substantial fuel-wood also sold locally by the traders. The traders procure fuel-wood from the individual collectors, stack them and also sell it to the local consumers, while the others transport it by trucks, van, rickshaw, pickup, etc. The marketing opportunities have increased during the recent times at the local level. The fuel-wood is traded at the rate of Tk. 200 -300 taka per van which contain about 2 mounds.

14. Traditionally, the local people are used to collect various resources from the Madhupur NP and other adjacent area. The entire ranges of the stakeholders could be broadly categorized into four groups. Local sawmills and furniture shops depend to some extent on the legal and illegal timber from the nearby forests. However, their livelihood is not dependent on the supply of timber from the Madhupur NP. Similarly, the Moholder's, who are involved with clear felling, are not also dependent on the timber from Madhupur NP. However, the local people who are employed by the Maholders and involved with illegal felling are entirely or partially dependent on the forest extraction activity for supporting their livelihood. Forest villagers are entirely dependent for fuel-wood and building materials for meeting HH needs on the forest. It seems that there is no alternate source for its supplies. They also collect vegetables, fruits and hunt some wildlife. But they are not dependent on these resources for their livelihood. The forest villagers are mainly dependent on pineapple, banana, papaya, hybrid mango and the lemon cultivation in the forest areas for their livelihood support.

15. A summary of information collected on resource exploitation from Madhupur NP. A total of 12 different types of resource are extracted from the forest. Of them, timber (includes both legal and illegal extraction),fuel-wood, coppies dead leafs are extracted on a large scale, bamboo and building materials on a medium scale, wildlife, fruits, vegetables, sun grass etc. on a minor scale, while honey, cane, medicinal plants on a negligible scale. The main purposes for resource extraction include meeting HH needs, selling for added income / and or to support and supplement livelihood. Timber felling, fuel-wood and bamboo collection, collection of house building materials, hunting etc. all are posing threats to the forest and its biodiversity through bringing qualitative and quantitative changes in the habitat and the wildlife they support. Moholder, local poor people, forest villagers and unemployed laborer are the major categories of resource user.

16. Among the tribal community, now-a-day's 90% children go to primary school, only 25% go to High School and only 10% study in the colleges. Among the adult, about 40 are illiterate (above 30 years of age). Among the Bengalee, approximately about 50-60% adult are literate, about 80-85% children go to primary school, about 60% goes to high school and about 25-30% goes to colleges.

17. The major occupations of the tribes are day labourer followed by fuel-wood collection, pine apple, papaya, banana cultivation, etc. Almost all HHs of tribe are engaged with some sort of agriculture cultivation, business and service. On the other hand, the major primary occupation of Bangalees are agriculture (approx.65-70%), principally paddy cultivation, followed by day labour including (22-25%), fuel-wood collection and timber poaching (4-5%), small business (2-3%), service (5%) and overseas employment (2%). The major secondary occupation is fuel wood and bamboo collection (5-8%), day labour (5-10%).

18. The plantation policy for the Madhupur National Park forest appears to be concentrated on the production of timber, cane, bamboo and some other forest products, with planning, establishment, management and harvest under the centralized control of the Forest Department. FD records show that plantation in Madhupur National Park Forest started in 2002 under FSP (Forestry Sector Project). The FD has also planted cane and bamboo in a substantial area. Along with the traditional plantation practice with valuable long rotational timber trees, present plantations in Madhupur National Park include Jarul, Chapalish, Agar, Garjan, teak, as well as short rotation exotic trees (i.e Acacia hybrid, Mangium, Moluccana, Euclyptus, Pine, Akashmoni) with mono species. Beside this bamboo and cane have been and being planted in many blocks.

19. Recommendation and suggestion for the project works implement can be mentioned in major sectors are administrative management, technical management, etc. Poor forest management by the Ministry of MoEF and Forest Department has been identified as one of the major reasons for forest degradation. Strengthening and capacity building of FD, along with local concerned authorities' engaged in forest management would have to be a prior area that IPAC can address. An appropriate, site specific and technically sound management Action Plan should be developed in consultation with local people

20. The possible challenges for the project are demarcation of boundary, occupancy right of forest dwellers on land use / forest resources, finalizing the legislatives status of Forest, replacement of planted forest by natural forest, transparency and accountability of the concerning authorities, empowerment of Forest Resource User Group; stopping fuel-wood, bamboo and building material collection; 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. Reducing use of chemical, fertilizer & insecticides; establishing co-management regimes for biodiversity conservation, etc. Besides these, for better result excavation / re-excavation of degraded Beels and canals, stocking indigenous endangered species, fish sanctuary, proper plantation on embankment of the Bongshai River and its braches and Fish Act implementation within project area the habitat can be restored.

21. A large number of people visit the forest. If infrastructures are developed this will attract more visitors and ecotourism could be planned accordingly. Also security of tourist must be ensured. To develop ecotourism activities of the project area can be introduced through IPAC like as development of extension materials, easy transportation facility from Dhaka and Mymenshing, eco-cottage and other living facilities, introduction of tourist vehicle, handicraft of forest resource, tourist shop, eco-guide, forest patrol group, Organizing ethnic cultural show, etc.

22. A number of monkey and languor groups are still inhabitant of Madhupur forest, Due to scarcity of adequate food and shelter, they are in vulnerable condition. In this regards, a rehabilitation scheme should separately be considered for resident monkey and languor groups of Madhupur forest. To this end he following activities can be considered; re-establishment of habitat continuity between the fragmented habitats of these primates and plantation scheme with food trees suitable for non-human primates such as Bohera, Horitoki, Amloki, etc.

23. Fuel-wood, bamboo and collection of some other major building materials should be stopped on a short term basis, but this may not be as success as long as there are scarcities 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. Therefore, project should strongly considered; establishment of a buffer sustainable resource use zone around the NP with provision for fuel-wood plots, woodlots and other plantations required for house building purposes. Providing resource substitution, promotion of fuel efficient stoves / oven in the locality, promotion of homestead plantation etc. can be implement.

24. Poor resource users, particularly those who are dependent on the forest for their livelihood, should be identified and brought under AIG programs with provision that they give up the unsustainable use of forests / forest resources. The possible AIG opportunities include Nursery, Bamboo and cane based handicrafts, Handicrafts, Poultry, Medicinal plant gardening and nursery, Ape culture, Fish culture etc.

25. Attempts should be made to bring the local elites on board with the concept of forest protection. In particular, the project needs to consult local public representatives, including local Chairmen and Members of Upazila / Union Parisad and MP, and involve them, at least in advisory role. The project should also work with existing local community organizations identified under the appraisals. Awareness raising activities should be carried out on a priority basis in the area to make the people understand how they would get benefit from this project. It is felt that the illegal resource users (illegal tree fellers in particular), get shelter from local authorities hence strong dialogue should be initiated among them involving the higher authority. A similar approach may be taken with local ethnic community based organization like as Joyenshahi Adivashi Unnoyan Parished, Ahsik Mishik Society, Indigenous People Development Services, etc. to ensure the effective involvement of them. 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 forest / forest resources.

26. The Shal forest habitat is a sample of much larger tracts of Shal that once existed here. Identified species of floral and fauna is doubtful. 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.

27. Finally we can be said that, to revive the natural forest resources as well as fisheries resources of Bongshai River 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

Acronym	Detailed name
ACF	Assistant Conservator of Forest
ADB	Asian Development Bank
ADRA	Advantage Development And Relief Agency
AIGA	Alternate Income Generating Activities
AMS	Ashik Mishik Society
ASA	Association for Social Advancement
BDR	Bangladesh Rifles
BELA	Bangladesh Environmental Lawyers Association
BNCC	Bangladesh National Cadet Core
BO	Beat Office / Beat Officer
BRAC	Bangladesh Rural advancement Committee
BRDB	Bangladesh Rural Development Board
BREB	Bangladesh Rural Electrification Board
CAP	Center for Advancement Program
СВО	Community based Organization
CBSDP	Charge of Bangladesh Social Development Program
CMC	Co-management Committee
CODEC	Community Development Centre
Dept.	Department
DF	Damien Foundation
DFO	Divisional Forest Officer
DoF	Department of Fisheries / Director of Fisheries
FD	Forest Department
FG	Forest Guard
FGD	Focus Group Discussion
Fig.	Figure
FRMP	Forest Resource Management Plan
FSP	Forestry Sector Project
GD	Group Discussion
GI	General Interview
GO	Government Office
GoB	Government of Bangladesh
Govt.	Government
HHs	Households
IGA	Income generating Activities
Int.	Interview
Intr.	International
IPAC	Integrated Protected Area Co-management
IPDS	Indigenous Peoples Development Services
IRG	International Resource Group
ISH	Institutional Stake Holder
JADP	Jovenshahi Adiyashi Unnovan Parished
kg	Kilogram
KI	Key Informant Interview
-	

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LGED	Local Government Engineering Department
MACH	Management of Aquatic Ecosystem through Community Husbandry
Mat.	Material
MCC	Mennonite Central Committee
MoEF	Ministry of Environment And Forestry
MoFL	Ministry of Fishery And Livestock
MP	Member of Parliament
NACOM	Nature Conservation Management
NFE	Non Formal Education
NGO	Non Government Organization
Nos.	Numbers
NP	National Park
NSP	Nishorgo Support Project
NTFP	Non Timber Forest Product
PA	Protected Area
PDB	Power Development Board
PIDIM	A Bengali named, microfinance organization
PRA	Participatory Rural Appraisal
PSH	Primary Stake Holder
RDRS	Rangpur Dinajpur Rural Service
RDS	Rural Development Sangstha
RDSM	Rural Development Social Mobilization
RF	Reserve Forest
RO	Range Office / Range Officer
RRA	Rapid Rural Appraisal
SEMP	Society for Protection of Medicinal Plant & Environment
SF	Social Forestry
SH	Stakeholder
SSH	Secondary Stake Holder
SSS	Society for Social Services
UP	Union Parishad / Upzilla Parishad
USAID	United States Assistant for International Development
YM CA	Youngman Christian Association

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 Comanagement (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 comanagement 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

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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 came under relentless human pressure as its population grows and forest land are converted To Whom It May Concern: 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 Madhupur Site and Logical Basis for Conducting PRA / RRA

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

Madhupur Site Integrated Protected Area (IPAC) project situated in three Upazillas namely; Madhupur, Muktagacha and Fulbaria. Madhupur is under Tangail District, Dhaka Division. Muktagacha and Fulbaria Upazilla under Mymenshing District, Dhaka Division. This is a New Direct IPAC site. For successful implementation of identified interventions in this site, it will concentrate on collection of relevant information by using 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 Madhupur Site is particularly concerned with the establishment of co-management mechanism of forest 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.

- **Co-management** -----stakeholders and their activities, socio-economics, behavior, community power structure, their needs and expectations, conflict, challenges etc.
- **Resource management** ---- resources and its status, trend and causes for resource degradation, resource exploitation, threats to local resources and biodiversity

This preliminary assessment of information needs for IPAC Madhupur 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

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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 Madhupur Site during January-March, 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 Madhupur 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 forest of Madhupur 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 Madhupur 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.

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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, socioeconomical 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 Madhupur 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.

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2. Description of the project site

2.1 Location: IPAC Madhupur Site situated in three Upazillas namely; Madhupur, Muktagacha and Fulbaria. Madhupur is under Tangail District, Dhaka Division. Muktagacha and Fulbaria Upazilla are under Mymenshing District, Dhaka Division.

IPAC Madhupur Site is bounded by Jamalpur Sadar and partly Mymenshing Sadar on the north, Trishal Upazilla and Bhaluka Upazilla on the east, Ghatail Upazilla and partly Gopalpur Upazilla on the south, and Sharishabari Upazilla and Dhonbari Upazilla are on the west.

There are 12 upazillas under Tangail District, namely: Tangail Sadar, Sakhipur, Basail, Madhupur, Gatail, Kalihati, Nagorpur, Mirzapur, Gopalpur, Delduar, Bhuapur and Dhonbari. There are also 12 upazillas under Mymenshing District, namely: Bhaluka, Dhobaura, Fulbaria, Gaffergoan, Gauripur, Haluaghat, Ishwargonj, Mymenshing Sadar, Muktagacha, Nandail, Fulpur and Trishal.

IPAC Madhupur Site is situated within Madhupur, Muktagacha and Fulbaria. IPAC Madhupur Site covers 7 unions of these three upazillas; 3 from Madhupur Upazilla, Muktagacha and Fulbaria have 2 unions each. Unions under Madhupur are Aushnara, Auronkhola and Sholakuri. Unions under Muktagacha are Ghoga and Dhowgow. Unions under Fulbaria are Nowgow and Rangamatia. The project area is about 125 km north of Dhaka on Dhaka-Mymenshing road (Fig.1 -8, 11-12). The park lies between 24°30′ to 24°50′ north latitude and 90° to 90°10′ south longitude.

2.2 Brief History: By synthesize the previous records; the area of IPAC Madhupur Site formed Myosin Period of Tertiary Era. It was about 2 to 3 cores of years before. According to the Geologist, the soil of this area contains huge amount of iron and aluminum. About 3 thousands years ago, the human settlements started in this area.

Although considererable forest loss has occurred at IPAC Madhupur Site in recent years, the site still represents an important and treasured part of the biological as well as cultural diversity of Bangladesh. Members of the Garo (Mandi) community are living in this area for over a hundred years of time. Some of Garo ethnic community resides within the boundaries of the declared Madhupur National Park. During the Liberation War, Freedom Fighters used the surrounding Sal Forests as base areas. The Park established in 1982. The Guest House (Dhokla Guest House) is renowned as the site of the drafting of the Wildlife Act of 1973. Father of the nation, the then Prime Minister Bangabandhu Shiiekh Mujibur Rahman stayed in this guest house for three days in 1973 and instructed to protect Madhupur Shal forest as an heritage with great importance.

2.3 Declaration: Within IPAC Madhupur Site, Madhupur Shal forest declared as National Park (NP) in 1982, though the proposal for the same raise in the year 1962.

2.4 Administration: Major parts are under Tangail Forest Division and a small portion is under Mymenshing Forest Division.

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2.5 Infrastructures Facilities/ Logistics:

• Management:

For the management view there are 1 ACF Office, 5 Range Offices, 12 Beat Offices, 4 Forest Camps, and 1 Nursery.

- Visitor: There are 4 Rest Houses, 4 Cottages, about 100 km. Walking Trail, 1 Lake, 5 Ponds, 2 Observation Towers, and 1 deer breeding center for visitor facilities.
- Staffs:

There are 1 ACF Quarter, 3 Range Officer's Quarters, 3 Beat Officer's Quarters, and 14 Forest Guard's Quarters for Forest Department Staffs accommodation.

- Vehicles: There are 8 Motorcycles, and 2 Pickups (need to be repair) are using as vehicles for Forest Department Staffs patrolling purposes.
- **Equipment**: None, considering the tools like as fire distinguish equipments, binocular, etc.

2.6 Habitat, Flora and Fauna: Topographically the landscape comprises mainly plain land with some area covered by forest. This site was once a largely dense forest area. The type of forest is deciduous with a mixture of evergreen forest. However, evergreen forest area is negligible. The main species of the forest is Shal / Gajari (*Shorea robusta*). Total identified plant species number is 176. Except Sal, the other floral species of the forest are Haldu, Koroi, Satian, Roina, Kadom, Dewa, Gutum, Ajuki, Neem, Kanchan, Shimul, Kanjal, Joyna, Palash, Sonalu, Gab, Jam, Bot, Ashatta, Jagdumur, Jial, Jiga, Jarul, Shinduri, Bonam, Amra, Chapalish, Amloki, Hortoki, Bohera, Hargaza, Gadila, etc. The herb and shrub species are Shati, Punch, Bashak, Shorpogondha, Ulatcombol, Shotomuli, Paharialu, Ampeng, Thaja, Dudalu, Adurag, Chutki gota, Kat badam, etc. There are many types of bamboo such as Jai bansh, Muli bansh and various canes like Jali bet, Golla bet. Besides, there are many types' climbers and vines, herbs and shrubs.

Rubber plantation: There are 4 Rubber Gardens / Estates with in IPAC Madhupur Site, namely Pirgacha Rubber Garden, Chandpur Rubber Garden, Sontoshpur Rubber Garden, and Kamalapur Rubber Garden. The 4 gardens contain total 7,314 acres of land. Pirgacha Rubber Garden contains 2,905 acres, Chandpur Rubber Garden contains 2,379 acres; both are under Mahupur Upazilla. Sontoshpur Rubber Garden consists 1,036 acres is under Madhupur and Fulbaria Upazilla. Kamalapur Rubber Garden consists 994 acres is under Madhupur and Muktagacha Upazilla. On everage, 200 numbers of rubber trees are in per acre. So, the estimative number of rubber trees is 1462,800 Nos. The plantation started form 1987, which is a leasing land from Forest Department. Duration of every leasing period is 40 years.

Identified fauna; 11 mammal species of which noteworthy are barking deer, monkey, capped languor, wild boar, Indian civet, wild cat, fishing cat, etc. identified 7 reptilian species are Spotted Pond Turtle, Ganges Softshell Turtle, Green Keelback Snake, Common Krait, Spectacled Cobra, etc. identified 4 amphibian species are Garo Hills Tree Toad, Flat-headed Frog, Assam Sucker Frog and Garo Hills Bubble-nest Frog.

Within identified 38 species, most common birds species are Red Jungle-fowl, Rufous Woodpecker, Gray-capped Pygmy Woodpecker, Fulvous-breasted Woodpecker, Green Beeeater, Pied Cuckoo, Asian Koel, Green-billed Malkoha, Lesser Coucal, Greater Coucal, Roseringed Parakeet, House Swift, Barn Owl, Spotted Owl, Emerald Dove, Rock Pigeon, Spotted Dove, Cinereous Vulture, Brahminy Kite, Great Cormorant, Cattle Egret, Great Egret, Little

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Heron, Indian Pitta, Common Iora, House Crow, Black Drongo, Greater Racket-tailed Drongo, Black-hooded Oriole, White-throated Fantail, Rufous-faced Warbler, etc.

Land surrounding the site and few patches within the forest is intensively cropped. The entire area including the connecting Canals, Streams and Rivers are intensively fished with a diverse variety 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 forest area as well as only river Bongshai followed by a rapid loss of connectivity due to encroachment and increased sedimentation.

The Bongshai River, flowing through IPAC Madhupur Site in the southern side of the forest. The Bongshai is a part of the old Brahmaputra. Finally, the Bongshai meet with the River Turag. The annual average temperature ranges; maximum 33.3°c & minimum 12°c. Average annual rail-fall is 1274 mm.

2.7 Ecological Context: One of the few remaining patches of Gajaree forest (original forest has been destroyed; current one is secondary forest, originated from coppice and seedlings) in Bangladesh.

2.8 The Bongshai, Canals, Beels, and Crops: In some parts of the project area, flood water enters in this area through the Bongshai, which get the flow from Old Brahmaputra. On the way, the River system connects many Canals, lower pockets (Beels) and tributaries which created a rich ecosystem for aquatic vegetation, fish, birds and other aquatic biota. The lower pockets (Beels) contain a few seasonal and perennial Beels rich of aquatic flora and fauna.

People surrounding the river basin largely depend on fishing. Boro rice is widely cultivated at the high and medium law 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.

Farmers use river and Beel water for irrigation. Withdrawal of water by shallow pump causes water scarcity in the river and Beels. Even some part of river dries up due to extensive irrigation.

2.9 Socio-economic Context: The NP is also a popular tourist spot during winter season (November to February) and experiences heavy visitor flow. Subsequently, many people are employed through various services to tourists. A huge number of people are living inside the NP, they are about 15,000 of as ethnic (Garo & Koch) and 42,000 non-ethnic. Similarly, a huge number of people depend on the NP for subsidence.

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Fig. 3: Social Map of Auronkhola Union Parisad



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Fig. 4: Social Map of Sholakuri Union Parisad



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Fig. 5: Social Map of Ghoga Union Parisad



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Fig. 6: Social Map of Dhowgow Union Parisad



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Fig. 7: Social Map of Nowgow Union Parisad



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Fig. 8: Social Map of Rangamatia Union Parisad



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3. Methodology

As mentioned in the preceding section a two-step rapid appraisal strategy has been conducted. RRA was conducted in the initial stage during 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 various 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 Madhupur Site with a view to understand:

- ➤ Who destroys the forest & why?
- How the forest being destroyed?
- > What are the underlying driving forces for forest degradation?
- Livelihood and behavior of local people;
- Opportunities for improvement in forest management;
- ➢ How IPAC can be involved in the process.

3.1 Developing the RRA and PRA: Issues and Methods

An interactive and consultative planning workshop was organized on 1st February to 2nd February 2009 at IPAC Central Cluster Office, Madhupur to identify, prioritize and finalize the RRA issues and questions. 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. The workshop was attended by specialists and representatives from IPAC team, field implementation partners (RDRS) and local FD staff, who were likely to be involved in the RRA field exercise. This workshop provided an opportunity 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 ensure that the methodology remained same across the team and across the sites. A one-day training workshop was organized for the RRA team members on 5th February 2009. A similar workshop was also held for PRA on 7th February 2009. The purpose was to give the RRA and PRA field team instructions in using various tools. The workshop was held at the IPAC Central Cluster Office, Madhupur, on RRA and PRA, respectively.

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.

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Table 1. Selected RRA Issues for Madhupur National Park, Specific Activities and Tools Used

SI.	RRA Issues	Specific activities	Tools	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 & Review Records	Local HHs Local school teacher, Doctor, Upazila level GO/NGO Offices; Community people (villagers, elites etc) Local community people Local people
2	SH Demographic profile	Settlement wise no. of HHs / population HH occupation, education, Dependency on forest resources, 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 -HH Richness/poverty Unemployment and its seasonal trend Credit and alternate income generating opportunities -Skill and skill development opportunities -Seasonal workload of male and female	HH Int. GD, KI, FGD, Seasonal Calendar	HHs heads/members Teacher, retired officers, old people Public representative Local elite Community people Forest villagers
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 FD staff towards the project -Sources of conflict and conflict resolution	FGD, GD HH int.	Local community FD staff HHs heads
6	Local Level Awareness	-Awareness and perceptions about resource degradation and conservation -Willingness for resource conservation -Awareness about the existence of nearby park/game reserve and reserved forest -Knowledge about forest and wildlife preservation acts	HH int., GD, FGD	HHs heads Local community FD staff
7	Resources /resource status	-Trend in changes in major resource bases - Endangered/extinct plant and animals -Causes for the decline in different resources	Trend analysis, HH int., FGD, GD, KI	Local people / FD staff Local HHs heads FD staff Community people Local educated old,

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Sl.	RRA Issues	Specific activities	Tools	Participants
8	Resource exploitation	-Major forest resources collected, including NTFPs -Reasons and extent of exploitation of different forest resources -Dependency on the forest/forest products -Seasonal trend in resource exploitation -Future risks -Medicinal plant uses and reason for not using these	HH int., FGD, GD KI, Trend analysis, seasonal calendar	Local HHs heads Public representatives & FD staff Community people Local educated old, Local elite and FD staff HHs interview and KI
9	Resource regeneration practices	-Plantation status in the locality -Problem with natural regeneration in the forest -Plant nursery -General land use pattern in the buffer zone -Major agricultural crop - Seasonal pattern in agriculture	Secondary Information, FGD, GD, KI, Seasonal calendar	Secondary data from FD staff Community people Local elite, teacher Community people
10	Legal aspects	-Access to the forest by locals -Forest villagers and land use agreement	FGD	FD staff and forest villagers
		-Conflict and negotiation with FD staff - Land encroachment/recovery -Law enforcement mechanisms in the PA	GD, KI FGD	Local community and local govt.
		-Illegal tree felling and forest cases	КІ	Local elites FD staff, community people Teacher, ex- officers,
11	Power structure	-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, KI, GD,	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 & FD 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, mobility, livelihood analysis etc., were used in addition to interviews, focus groups and more informal discussions. More than one tool was used to explore 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.

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Table 2.	PRA	Issues,	Specific	Activities	Performed	and	Tools	Used i	n IPAC	Madhupur
Site			-							-

SI.	Issues	Specific activities	Tools	Participants
1	Forest make up dynamics	-observation on forest physiographic and topography and forest make up -land use cover, resource exploitation and regeneration areas, animal distribution -changes in forest cover, thickness, vegetation, settlements, animals and availability of resources	Transect walk, KI Resource mapping Secondary data, FGD, KI Trend analysis	PRA Team Local elite, FD staff and , 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 FGD & GD and Ranking	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	-Role in family decision making -mobility -workload -Education and access	Decision making Chart Mobility map Daily and seasonal work chart HHs Int. & FGD	Women and local educated people
5	Fuel collection wood	 -Information on collector -Purpose and driving force for collection -Dependence on the extraction for their livelihood and its extent -Uses and marketing channel of the resource -Level of extraction and seasonality - Conflict with FD or other people over the extraction -Negotiation for carrying out the activity - Alternate source for the collection of the resources -Needs and expectation of the collector -Impact on the forest and future risks for the collector 	FGD & GD, seasonal analysis	Fuel wood collector, community people, local hotel and tea stall owners, local Imam and other religious person

Sl.	Issues	Specific activities	Tools	Participants
6	Illegal felling timber	-Information collector -key people behind the activity and network -Purpose and driving force for collection - uses and marketing channels and dependence - What encourages them to take up the activity -Anybody protect them, if they are in problem -Protection by FD or by any other agencies (e.g. Police etc.) - conflict and negotiation with FD or other people -needs and expectation of the feller -impact on the forest and future risks for the illegal feller -Seasonality and trend in timber extraction	FGD, GD and KI Seasonal calendar and trend analysis	Illegal timber feller, FD staff and community people, teacher and local elite
7	Collection of trees as building materials	-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 FD or other people over the extraction - alternate source for the collection of the resources -needs and expectation of the collector -impact on the forest and future risk for the collector	FGD, GD, KI	Community people, FD staff , , forest villagers, local public representative e and elite
8	Bamboo and cane 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 FD or other 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	Bamboo and cane collector, community, people and FD staff Bamboo collector and local people
9	Information on Forest villagers & Ethnic Community	 -Distribution of forest villager's & ethnic communities settlements -Registered and actual number of forest villagers -Compliances to FD agreement -Present economic activities -Resources exploitation and dependence on forest resources -land encroachment by the forest villagers or by their dependant -relationship and conflict with FD -internal governance system -needs and expectation 	FGD Secondary data	Forest villagers, Ethnic Community and FD staff FDs villagers register

SI.	Issues	Specific activities	Tools	Participants
10	Pineapple, lemon, papaya, banana, cultivation	-distribution of Lemon yards within and approximation of its number -historical perspective of flourishing the activity in the area -information on cultivator -ownership of land -dependence on the activity -Impact on the forest resources -Conflict with FD	FGD GD GD	Lemon cultivator FD staff Local community

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: fuel-wood, bamboo and timber collection, unemployment, workload, accessibility to forest, transportation problem, brickfield / sawmill operation, forest patrol, agricultural activities, collection of building materials, hunting, vegetable collection, damaged by wild bore, sun-grass extraction.

Trend analysis: forest cover, forest thickness, tall trees, herbs and shrubs, forest use, unemployment, local solvency, land encroachment, settlement / population solvency/income, livelihood expenditure, literacy, unemployment, use of forest for income, use of forest for HH needs, transportation and mobility, homestead plantation, food scarcity, credit and IGA, occupation, damages by wild bore, wildlife, hunting, illegal tree felling, fuel wood collection, bamboo and cane collection, fruit bearing trees in the wild, livestock, turtles and tortoises, agricultural activities, medicinal plants.

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

Transect walk: Soil, vegetation, land use, elevation, crops, wildlife, human activities etc

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

Mobility: Various professional group identification; their daily and seasonal movement.

Road Networking: Inter district roads, secondary roads within the locality, pacca and semi pacca roads and forest traks identified by using local maps and physical visits.

3.2 Preparation of Fieldwork

3.2.1 Formation of RRA and PRA Field Teams

The RRA field teams were formed with representatives from RDRS Bangladesh, Worldfish Center, and FD local staff, having biological and sociological background. The teams make up for the RRA and PRA field exercises are provided in the table 5. During RRA and RRA field teams were formed a common team (Table 3). The teams worked simultaneously in the field of different locations.

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Table 5. Team of PKA and KKA of IPAC Madnupur Site				
Sl. No.	Name	Organization		
01	Masood Siddique	IPAC-Worldfis		

SI. INO.	Name	Organization
01	Masood Siddique	IPAC-Worldfish Center
02	Shital Kumar Nath	IPAC-RDRS Bangladesh
03	Shariful Islam	IPAC-RDRS Bangladesh
04	ABM Shahidul Hoque	IPAC-RDRS Bangladesh
05	Md. Zakir Hossain	IPAC-RDRS Bangladesh
06	Lutmon Edmond Podhuna	IPAC-RDRS Bangladesh
07	Baly Chambugong	IPAC-RDRS Bangladesh
08	Swapna Chisim	IPAC-RDRS Bangladesh

3.2.2 Selection of RRA and PRA Sites

On the basis of information provided by local FD and other GO agency staffs 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 the Reserve Forest area. However, because of the size and geographical location of the RF, 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 forest within the Madhupur National Park (NP) area. A list of the selected RRA and PRA spots for IPAC Madhupur Site is given in Tables 4 and 5.

3.2.3 Selection of RRA and PRA Transect Route

To get a quick physical view of the whole project area four transect conducted from different direction as Table 4 and Fig.9

Sl. No.	Date	From	То	Route and area coverage
01	03.03.09	Rasulpur Range	Cahraljani Range	Through forest north-east to
		Office	Office	south-east. Rasulpur Range
				and part of Charaljani range.
02	04.03.09	Sholakuri Bazar	Jalchatra	Jalchatra-Sholakuri road;
				from west to east.
03	07.03.09	Cahraljani Range	Sontoshpur Beat	Through forest adjacent
		Office		village area and patches of
				forest south-west to east
04	11.03.09	Dokla Range Office	Rasulpur Sadar	Through core zone area of
			Beat	the forest, middle part of the
				forest south-west to north-
				east

Table 4. List of Transect Schedule

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3.2.4 PRA Schedule, Spots and PRA Activities

There are 187 villages within the project area under 7 unions. Out of those main PRA spots of the project area listed in table 5.

Date	Village/ Location	Performed activities	Remarks
14.03.09	Aushnara UP	GD(1), HH interview(3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
15.03.09	Village: Idilpur, Aushnara	GD (1), HH interview (3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
17.03.09	Auronkhola UP	GD (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
18.03.09	Village: Pegamari, Auronkhola	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
21.03.09	Sholakuri UP	FGD (1), KI (1), HH interview (4) Social Mapping	FGD with forest villagers, KI with head man of forest village, HH with female group
23.03.09	Village: Sholakuri, Sholakuri	FGD(1) Forest resource mapping, Transect work	FGD with forest staff, Forest resource mapping, and FD Staff
24.03.09	Ghoga UP	GD (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
25.03.09	Village: Charipar, Ghoga	GD(1), HH interview(3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
28.03.09	Rangamatia UP	GD (1), HH interview (3) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
29.03.09	Village: Hatilet, Rangamatia	GD (1) HH interview (4) Social Mapping	GD with local community & HH inter view with female participants. Social Mapping with KI
01.04.09	Dhowgow UP	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
02.04.09	Village: Katalia, Dhowgow	FGD (1), KI (1), HH interview (4) Social Mapping	FGD with forest villagers, KI with head man of forest village, HH with female group
05.04.09	Nowgow UP	FGD(1) Forest resource mapping, Transect work	FGD with forest staff, Forest resource mapping, and FD Staff
06.04.09	Village: Sontoshpur, Nowgow	FGD(1) Forest resource mapping, Transect work	FGD with forest staff, Forest resource mapping, and FD Staff

Table 5. PRA Schedule, Spots and PRA Activities in Madhupur Site

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3.3 Field Implementation Strategies

3.3.1. Organization of RRA and PRA field work

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

Fig. 10. Flow of RRA / PRA Field Activities (Duration: 3-4 days)



During RRA exercise, a total of 40 HHs interviews, 2 focus group discussions, 4 group interviews, 4 key informant interviews, were conducted. The other RRA tools were applied during above mentioned interviews and discussions. Similarly, during PRA a total of HH56 interviews, 12 Group interviews and 7 focus group discussions, 6 key informant interviews were conducted. This is summarized in Table-6.

Table 6. Summary of Performed Activities in Madhupur Site during PRA & RRA at a Glance.

Appraisal	Village covered	FGD	GD	KI Interview	HH Interview	Transect	Resource and social mapping
RRA	7	2	4	4	40	3	7
PRA	14	7	12	6	56	4	7

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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 random selection of 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 treated as respondents to a questionnaire, 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 that would be relevant to the project needs.

- KI interview was by prior appointment. A local guide helped in making appointments 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 FD staff, IPAC field partner staff and interview of local people gave adequate clue for selecting KI. Preferably local school teachers, retired officials, local elites or local public representatives were 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 used for the purpose of KI interview.

3.3.4 Group Interview (GI)

• 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.

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- · 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 1.0 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 (FGD)

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 FD staff, forest villagers, local public representatives etc. other

professional groups, like fuel-wood collector, sawmill owner, 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 FD

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, mobility, trend analysis, ranking, scoring, record reviewing 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.

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3.3.8 Secondary Information Collection

Some demographic data was collected from the relevant local Union Parishad sources. The secondary information collected from several sources for report preparation.

3.3.9. Reflection and Analysis

After each day of fieldwork, the team sat together for about $1 \frac{1}{2}$ hours for team interactions 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

- Next day's activity planning
- Methodological review

3.3.10 Triangulation and filtering

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

No remarkable limitations observed in PRA and RRA period. The mentionable limitations were as below:

- ethnic people has least intention to provide information due to confusions about our future work plan with them
- FD staff and local muscle men in some cases used to keep hidden the real information
- logistic support for PRA and RRA was not sufficient



Fig. 11: Social map of Bhutia (a village of Auronkhola Union)







4. Findings

4.1 Forest Resources: Status and Trend

A study in 1968 reveals that the total area of Madhupur Shal forest was 24,292 ha of which only about 8,436 ha of Madhupur National Park (NP) still, though in poor condition, are in natural condition with very thin original timber vegetation. In fact, most parts of the natural forest have been altered by clear felling and subsequent long- and short rotational plantation practices. However, in some of the oldest long-rotation plantations, the vegetation cover has taken on the structure of a secondary natural forest with the re-growth of creepers and naturally occurring trees and undergrowth species.

Comparing the 5 forest resources maps (1967 Fig. 13, 1973 Fig. 14, 1989 Fig. 15, 1999 Fig. 16, 2003 Fig. 17 and 2007 Fig. 18) it is easily understood that the forest area is decreasing day by day & this trend is very rapid. From 1968 to 2006 about 65% forest area has been destroyed by last 38 years.

Once this forest was highly enriched with diverse biodiversity; Elephant, different species of Indian Tigers, Bears, birds such as Peacock, Parrots, etc were available here and now extinct from here.

The biodiversity lost in course of time due to increasing settlement, more human invasion, the sound of air force's firing range, free roaming the livestock, forest firing, etc. By the impact of the mentioned factors the forest is shrinking, the wildlife is losing their habitat and food.

Secondary data collected on the forest show that there are about 176 plant species, 4 amphibian species, 7 reptilian species, 38 avian species and 11 mammalian species have been identified.

The main species is Shal / Gajari in this deciduous forest. Total identified plant species number is 176. Except Shal, the other timber species of the forest are Haldu, Koroi, Satian, Roina, Kadom, Dewa, Gutum, Ajuki, Neem, Kanchan, Shimul, Kanjal, Joyna, Palash, Sonalu, Gab, Jam, Bot, Ashatta, Jagdumur, Jial, Jiga, Jarul, Shinduri, Bonam, Amra, Chapalish, Amloki, Hortoki, Bohera, Hargaza, Gadila, etc. The herb and shrub species are Shati, Punch, Bashak, Shorpogondha, Ulatcombol, Shotomuli, Paharialu, Ampeng, Thaja, Dudalu, Adurag, Chutki gota, Kat badam, etc. There are many types of bamboo such as Jai bansh, Muli bansh and various canes like Jali bet, Golla bet. Besides, there are many types' climbers and vines, herbs and shrubs.

Still there are many medicinal plant species are available in the forest area such as Shaktibindu, Atpolash, Phonkiraj, Alkashi, Joldoga, Taruchondal, Joina, Shasmul, Chinibadam, Kalojam, Kuruj, Chulagas, Dolmanik, Aghatita, Jogdumbhu, Dumur, Chalta, Acgina, Agargota, Gadila, Giga, Thurukchandal, Bormachandal, Gochaksagor, Hudkhors, Arbakhos, Goachokkor, Kalkustani, Banari, Sharnalata, Tepa, Atapnama, Bhawa, Pudina, Shati, Acangi, Khababchini, Tokma, Chomble, Jogini, Chorka, Jolpai, Kosthuri, Galakul, Gagushas, Shitribindhu, Hortaki, Amloki, Chirota, Arjun, Lis, Shatamul, Arshaghonda, Kalamegh, Ghetakanchan, Shorpagondha, Golmalancha, Tahnkuni, Olotkomble, Bonpiaj, Putnengra, Bonaka, Bondalim, Jafran, Amra, Bontulashi, Nayantara, Polash, Ghetakumari, Madhu, Kamranga, Pathorkuchi, Hatishur, Shiris, Nagdana, Kharajora, Oakpathor, Ajuli, Dhudkolmi, Chonkhangshas, Mishangkhacci, Akonda, Roktoamloki, Howamash, Ramashus, Galamul, Nabinori, Gam, Upthlangra, Lazzabati, Gondhabadal, Bashokpata, Dudkumra, Pamgandi, Shimul, Jostimadhu,

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Piplos, Shawra, Titakola, Karamcha, Ishubgul, Moniraj, Dudnari, Batamul, Rahuchandal, Samdamul, Samkangsha, Bishlong, Sharnashikor, Krishanakanchan, Phadgulancha, Bonada, Shalphada, Titbagun, Baulagas, Ediurdana, Harmoska, Bishalu, Chongibirat, Shatabindu, Baidda, Bilaishungi, Mon, Chukakola, Sotnai, Bonboroi, Roktochandon, Alot, Bonrashun, Ashok, Bishgota, Kentugota, Chukgota, Mitajam, Puljam, Tepaphol, Bargacha, Jayastamadhu, Bhikumra, Khaschalta, Chonggenshum, Kalguba, Kalihoa, Dalshubhanimum, Ghukrigubha, Kashali, Titgajor, Patigira, Dhoa, Bonritepa, Hostikoinna, Agunshura, Jaiphal, Jolkumra, Ramhuit, Talmul, Kalakuma, Kailakata, Dosmul, Chandimul, Dudrag, Bhahurgota, Kanaiginga, Phurnadoga, Binnatini, Agurtuta, Shaitan Alu, Parbatshira, Kadolbel, Belgas, Payara, Aoulagota, Aput Lengra, etc. Directly or indirectly most of indigenous herbal medicinal companies depends on these medicinal resources.

Among exotic short-rotational trees, Acacia hybrid, Mangium, Malacanna, Eucalyptus, Akashmoni, are common in plantation areas.

Identified 4 amphibian species are Garo Hills Tree Toad, Flat-headed Frog, Assam Sucker Frog and Garo Hills Bubble-nest Frog.

Identified 7 reptilian species are Spotted Pond Turtle, Ganges Soft-shell Turtle, Green Keel back Snake, Common Krait, Spectacled Cobra, etc.

Within identified 38 species most common birds species are Red Junglefowl, Rufous Woodpecker, Gray-capped Pygmy Woodpecker, Fulvous-breasted Woodpecker, Green Beeeater, Pied Cuckoo, Asian Koel, Green-billed Malkoha, Lesser Coucal, Greater Coucal, Roseringed Parakeet, House Swift, Barn Owl, Spotted Owl, Emerald Dove, Rock Pigeon, Spotted Dove, Cinereous Vulture, Brahminy Kite, Little Cormorant, Great Egret, Cattle Egret, Great Egret, Little Heron, Indian Pitta, Common Iora, House Crow, Black Drongo, Greater Rackettailed Drongo, Black-hooded Oriole, White-throated Fantail, Rufous-faced Warbler, etc.

Out of identified 11 mammal species, note worthy are barking deer, monkey, capped languor, wild boar, Indian civet, wild cat, fishing cat, flying squirrel etc.

The natural vegetation is restricted to a limited area and dominated by indigenous tree species, like awal, jam, chaitan, jam, rata, dumri, menda, bot, chapalish The natural forest is moderately thick with plenty of underneath vegetation. The rest of the areas are covered by plantations, both long and short rotation plantations. The long rotation plantations are also limited to small areas (5 small plots) and dominated by teak, jarul, garjan, mahogoni etc. Most parts of the forest are covered with short rotational plantations. Some of the short rotational plantations are of mixed species; the main species are acacia, eucalyptus, mengium etc. There are some monospecies short rotational plantations. These mainly include meloccana, agar, palm etc. Bamboo and cane have been planted in a number of plots. The only cultivation area includes pineapple, banana, papaya, lemon garden, established by forest villagers.

As can be seen from Fig. 8, the major wildlife species are concentrated in the natural forest areas. The important species are capped languor, monkeys, barking deer, wild boar, jungle fowl etc. Some major wildlife species are also available in the long rotation plantations. The new plantations of exotic trees are very poor in its wildlife. The monkeys are also found in the peripheral areas of the park. The wildlife comes from the forest in locality due to their food scarcity in the forest as well as while forest is under fire. In winter season some people intentionally or unconsciously make fire in the dried leafs, ground of the forest which destroy

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the forest resources. This is a common phenomena and in near future will become the main cause of forest destroy.

4.2 Rubber Plantation

There are 4 Rubber Gardens / Estates with in IPAC Madhupur Site, namely Pirgacha Rubber Garden, Chandpur Rubber Garden, Sontoshpur Rubber Garden, and Kamalapur Rubber Garden. The 4 gardens contain total 7,314 acres of land. Pirgacha Rubber Garden contains 2,905 acres, Chandpur Rubber Garden contains 2,379 acres; both are under Mahupur Upazilla. Sontoshpur Rubber Garden consists 1,036 acres is under Madhupur and Fulbaria Upazilla. Kamalapur Rubber Garden consists 994 acres is under Madhupur and Muktagacha Upazilla. On everage, 200 numbers of rubber trees are in per acre. So, the estimative number of rubber trees is 1462,800 Nos. The plantation started form 1987 to 1997 at different locations of the project area. All rubber plantation areas are a leasing land from Forest Department. Duration of every leasing period is 40 years.

Employment of Rubber Garden: On an average of each day, total 1276 labors are involved with rubber fluid collection process from rubber trees. There is a factory in each garden provided average 35 people for their daily works. The above involving labors figure can be varied season to season.

4.3 Wetland Resources within Project Area

IPAC modhupur site have some wetland resources as follows:

- Bonshai River: Originated from Old Brahmaputra in the north and flows over Modhupur Upazila and ended in Turag River in the south. This river tributary has high importance in fish migration for indigenous species. At present the physical condition of this river tributary is very much vulnerable due to encroachment and pollution.
- Small Lake in Madhupur Forest: There is a small lake like water body inside forest. This was renovated by FD. There is good potential for fish culture in this water body.
- Ponds: A number of ponds found inside and in the periphery of the forest. These water bodies if possible can be utilized by IPAC as a regular income source for the CMCs.

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Fig. 13: Landuse / cover map of Madhupur National Park, 1967



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Fig. 14: Landuse / cover map of Madhupur National Park, 1973





Fig. 16: Landuse / cover map of Madhupur National Park, 1999



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Issue	Before 1971	15 years back	Present	Reasons of changes	Future Risk
Forest Cover	00000	0000	00	Clear felling in the past and present	High
Forest Thickness	00000	000	00	Clear felling, illegal tree felling, burning and weeding practice for plantation in natural and planted forest areas, fuel-wood collection etc.	High
Tall trees	00000	000	0	Legal feeling in the past and present, timber poaching, etc.	High
Herbs and Shrubs	00000	000	0	Burning and weeding, for new plantation in natural and artificial forest area, fuel-wood collection,	Medium
Wildlife	00000	000	0	Habitat loss, food scarcity, lack of safety, hunting in the past, disturbances by resource collectors	High
Hunting	00000	00	00	Prohibition, and unavailability of game animals and birds	Less
Illegal tree felling	0	000	000000	Greed of some local FD staffs for extra benefit, illegal timbre business of powerful people, local poverty, unemployment	High
Fuel-wood Collection	0	000	00000	Traditional practice of local people for HH consumption, local poverty, unemployment, easy access.	Moderate
Bamboo (natural)	00000	000	00	Natural bamboo stock decreased due to auction and over exploitation	High
Bamboo (planted)		00	0000	Stock increased due to FD's plantation strategy	No risk
Cane		0	00000	Stock increased due to plantation by FD since 1997	No risk
Fruit bearing trees in the wild	00000	000	0	Natural death, felling, fuel-wood collection, absence of fruit trees in new plantations	High
Medicinal plants	00000	000	0	Habitat destruction, clear felling, land clearing in the way of plantation, lemon plantation Fuel-wood collection,	High
Livestock	00	000	0000	For alternative income	No Risk
Agricultural activities	000	0000	0000	Cultivation of various agricultural species, new variety cultivation in the locality	Less
Sun grass	00	00000	00	Over exploitation, claiming land sun- grass bed, grew as result of clear felling for new plantations	Moderate
Vegetable	0000	000	00	Clear felling, plantations of exotic species, ,	Less
Fodder	00000	000	00	As above	Medium
Honey	00000	00	0	Clear felling of trees, decrease in fruit bearing trees, and monoculture with exotic plant species	High

Table 7. Status and Trend in Changes of Resources in IPAC Madhupur Site Area

Table 7 shows the changes in forest make up, forest resources and resource related activities with time. Virtually, there has been a major change in forest cover and the cover has decreased by only about 15-20%, compared to pre-liberation period. On the other hand, forest thickness and abundance of tall trees have decreased approximately by 60%. The abundance of herbs and shrubs and sun-grass has also decreased by about 65% due to clearing and claiming land for plantations. Indigenous bamboo now remains only by 8%. Except birds, the abundance of major wildlife has also decreased by more than 60%. The abundance of medicinal plants has also decreased by 60%. Since the forest has been degraded in its plant stock and nature, it has become less suitable for the wildlife as their habitat. The decrease in the abundance in wildlife has probably caused by 60-70%. The abundance of fruit bearing trees has decreased by 75%. The NTFPs, like honey and sun-grass have also decreased alarmingly. Many wildlife species have been extinct by now from the forest. Among the extinct animals, tiger, elephant, leopard, peacock etc. are notable. Some other wildlife, like small monkey, capped langur, deer (barking deer), fishing cat, gibbon, python, wildfowl, cobra, hornbill, vultures and turtles etc, are threatened. Trend in changes in the resource collection activities is shown in Table ?. Compared to pre-liberation period, activities like illegal timber felling and fuel-wood collection have increased by 60-65%. On the other hand, collection of wild bamboo decreased by about 40%, while that of wild bamboo and honey decreased by about 80% owing to unavailability of these resources. Collection of sun-grass has however increased during 80's due to large scale felling and then slightly declined by now, again due to claiming of sun-grass beds for plantations. Hunting of wildlife has also decreased by more than 80% mainly due to serious decline in the resource. Widespread tree felling occurred during liberation and immediate after liberation period.

4.4 Comparison of present and past livelihood of forest dwellers

Impact of decreasing the forest resources forest dwellers livelihood has changed tremendously (Table.8). At past time, forest dwellers mostly depend on forest based resources but at present they are compelled to convert their livelihood dependency on non-forest based income generation activities.

Past livelihood	Present livelihood
• Fully depended on forest resources, a very few were engage in agriculture	Forest resource user groups livelihood highly vulnerable
• Very less or no use of chemicals or insecticides in agriculture	• Excesses use of chemical fertilizer, insecticide in social forestry, commercial banana and pineapple culture cause in harm to forest environment
 People used to extract "Bon kachu (wild rum)", "Bon alu (wild potato)", "Bon misticumra (wild pumpkin)"etc. as food from forest 	• Culture of hybrid vegetables significantly increased have to forest dwellers buy those from market
• Around 200 species of medicinal herbs and shrubs were abundant. For common treatment people used treatment on herbal physician.	• Almost all medicinal herbs and shrubs are nearly extinct. Forest dwellers have depended on modern treatment but such treatment also scarce for them.
• Died and dead brunches were used as fuel wood	People have to buy fuel wood from market

Table. 8 Past versus present livelihood pattern

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Past livelihood	Present livelihood
• Forest bamboo and cane were the sources of income for the ethnic women.	• As these resources are destroyed, their source of income became limited and expansion of such industry has almost ruined.
• Forest dueler used to honey from nature and could earn buy sailing those. Some part use as household consumption.	• Natural honey nearly extinct. And culture practice also not well practiced.
• Grazing area were abundant in the forest and there were no scarcity of cattle feed.	• Cattle grazing area and feed highly decreased.
• The forest ecosystem was enriching by biodiversity. There was no rubber garden.	• Due to decreased in forest area and increased the area of rubber garden, biodiversity destroyed extensively.
 Forest dwellers culture was forest based. 	• Such culture nearly extinct.
• Invention of tourist was very less.	• Tourist increases significantly, causing harm to social environmental and cultural livelihood of forest dwellers.

4.5 Ranges and Beats of the Park

The forest area divided into 5 Ranges and 12 Beats. The position of the Beats and ranges are shown in the following table (Table 9).

Sl. No.	Name of Beat	Name of the	Under the	Name of
		position of	Upazilla and	Range
		Union	District	
01	National Park Sadar	Auronkhola +	Madhupur,	
	Beat	Ghoga +	Tangail	
		Sholakuri		National Park
02	Rajabari Beat	Auronkhola	Madhupur,	Sadar Range
			Tangail	
03	Gachabari Beat	Auronkhola	Madhupur,	
			Tangail	
04	Baribaid Beat	Auronkhola	Madhupur,	
			Tangail	
05	Lohoria Beat	Auronkhola +	Madhupur,	
		Sholakuri	Tangail	
06	Dokhla Sadar Beat	Sholakuri	Madhupur,	
			Tangail	Dokhla Range
07	Chanpur Beat	Auronkhola	Madhupur,	
			Tangail	
08	Auronkhola Sadar Beat	Auronkhola	Madhupur,	Auronkhola
			Tangail	Range
09	Charalgani Beat	Auronkhola	Madhupur,	Madhupur

Table. 9 Name of Beats and its location

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Sl. No.	Name of Beat	Name of the position of Union	Under the Upazilla and District	Name of Range
			Tangail	Range
10	Mahishmara Beat	Aushnara	Madhupur,	
			Tangail	
11	Rasulpur Beat	Ghoga and	Muktagacha,	
	(Two forest camps)	Dowgow	Mymenshing	Rasulpur Range
12	Sontoshpur Beat	Nowgow and	Fulbaria,	
		Rangamatia	Mymenshing	

4.6 Number of Staff

The involving forest of the project area includes: 2 DFOs (Divisional Forest Officer; Tangail and Mymenshing), 2 ACFs (Assistant Conservator of Forest; Tangail and Mymenshing), 5 ROs (Range Officers), 12 BOs (Beat Officers including Tangail and Mymenshing), 29 FGs (Forest Guards), and 9 Other Staffs (like as Gardener, Office Assistant, Peon, etc.).

4. 7 Settlements in and Around IPAC Madhupur Site and its Level of Stakes with the NP

4.7.1 Settlements

A total of 187 villages having varied degree of stakes with the forest have been identified. The villages belong to 7 Unions namely; Aushnara, Auronkhola, Sholakuri, Ghoga, Dhowgow, and Rangamatia of the project area (Table 10). There are some rubber gardens within and border of the forest.

District	Upazilla	Union	Number of Mouja	Number of Village
		Aushnara	29	36
Tangail	Madhupur	Auronkhola	10	44
		Sholakuri	05	33
	Muktagacha	Ghoga	25	26
Mymenshing		Dowgow	29	28
	Fulbaria	Nowgow	11	11
		Rangamatia	06	09
		Total	115	187

 Table 10. List of the name of Districts, Upazillas and Unions of the IPAC Madhupur

 Site

Source: Census 2001, local Statistical Bureau Office, Modhupur, Muktagacha and Fulbaria Upazilla

4.7.2 Demography

A number of 07 Unions having varied degree of stakes with the project have been identified including 115 Moujas (Table 11). Total project area is 309.98 Sq. Km. Total Household of 187 villages is 71051 Nos. with population of 236368 including 120543 male and 115825 female (Table 11).

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Name of	Area of the	Household	Population	Population	Total
the Union Union in Sq.			(Male)	(Female)	Population
	Km				
Aushnara	43.76	10964	24514	24197	48711
Auronkhola	134.00	11445	25431	23737	49168
Sholakuri	35.00	6104	13733	12963	26696
Ghoga	28.41	26343	13494	12849	26343
Dhowgow	10.00	9256	20514	19668	40182
Nowgow	28.47	4500	11716	11599	23315
Rangamatia	30.34	2439	11141	10812	21953
Total	309.98	71051	120543	115825	236368

Table 11 Area of the Project and union-wise number of Household, Population (male and female)

Source: Census 2001, local Statistical Bureaue Office, Madhupur, Muktagacha and Fulbaria Upazilla

4.7.3 Level and role of stake

Table 12 Provides information of the Unions total population, level and role of stake with the forest. There are three types of stakes depends on their roles. The major type of level of stake, live in Auronkhola & Sholakuri; medium-Minor type of stake live in Aushnara & Ghoga; and Minor type of stake live in Dhowgow, Nowgow and Rangamatia.

Table 12. Information on Unions Having Stakes with Madhupur National Park (NP) Area

Name of	Total	Level of stake	Role of stake
the Union	Population		
Aushnara	48711	Medium-Minor	Mainly collect fuel-wood and dried leaves, some involve with illegal tree felling
Auronkhola	49168	Major	Collect fuel-wood and dried leaves, house building materials, vegetables and other NTFPs, cultivate pineapple, banana, papaya, lemon and other
Sholakuri	26696	Major	Collect fuel-wood and dried leaves, house building materials, vegetables and other NTFPs, cultivate pineapple, banana, papaya, lemon and other
Ghoga	26343	Medium-Minor	Mainly collect fuel-wood and dried leaves, some involve with illegal tree felling
Dhowgow	40182	Minor	Mainly collect fuel-wood and dried leaves
Nowngow	23315	Minor	Mainly collect fuel-wood and dried leaves
Rangamatia	21953	Minor	Mainly collect fuel-wood and dried leaves
Total	236368		

4.7.4 Road network of Project Area

The roads within the project area form a frame of network. Easier accessibility by using these access roads is one of the main causes of forest resource degradation. The illegal forest resource collector can easily move within and around the forest comfortably. (Fig. 9).

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4.7.5 Educational institutions

There are 32 Non-Government High and Junior High Schools, 52 Government Primary Schools, 40 Registered Primary Schools, more than 64 Madrashas and more than 161 Moktabs (Table 13).

Table 13. Union-wise number of High	School, Primary	School, F	Registered	Primary
School, Madrasa and Moktab				

Union	Non-	Government	Registered	Madrasha	Moktab
	Government	Primary	Primary	(Dhakil,	
	High and	School	School	Ebdadia,	
	Junior High			etc.)	
	School				
Aushnara	08	12	10		
Auronkhola	05	11	07	17	
Sholakuri	03	02	06	01	06
Ghoga	02	05	02	27	-
Dhowgow	05	09	05	04	50
Nowgow	03	06	06	06	85
Rangamatia	06	07	04	09	20
Total	32	52	40		

4.7.6 Religious institutions

Inhabitance of the project area consist different types of ethnic and religious groups, where the Muslims are the majority. The religious institutions within the project area are: Mosque 455 Nos., Temple 33 Nos. and Church 45 Nos. (Table 14). There is no temple in Rangamatia Union and no church in Dowgow Union.

Name of the Union	Mosque	Temple	Church
Aushnara	110	04	02
Auronkhola	98	08	26
Sholakuri	48	04	14
Ghoga	47	06	01
Dowgow	58	04	-
Nowgow	54	07	01
Rangamatia	40	-	01
Total	455	33	45

Table 14. Union-wise Religious Institution (Mosque, Temple, Church)

4.7.7 Community facilities

The community facilities within the project area are average comparing to the other part of the Bangladesh. There are 7 Hospitals, 34 Community Clinics, --- Sanitary Latrines, --- Tube Wells, --- Deep Tube Wells, and 63 Hats / Bazars (Table 15).

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Table 15. Union	Table 15. Union-wise Community Chine, Tube wen, Deep Tube wen, Hat / Dazar							
Name of the	Hospital	Community	Sanitary	Tube	Deep Tube	Hat /		
Union	_	Clinic	Latrine	well	well	Bazar		
Aushnara	01	06	6471	1000	-	08		
Auronkhola	01	09	8642	446	343	23		
Sholakuri	03	04	5160	429	191	09		
Ghoga	-	03		210	29	03		
Dhowgow	01	09	5000	2236	-	07		
Nowgow	01	02	761	-	-	10		
Rangamatia	-	01		-	-	03		
Total	07	34				63		

Table 15. Union-wise Community Clinic, Tube well, Deep Tube well, Hat / Bazar

4.7.8 Credit

Several NGOs, and banks provide micro-credit to local people. About 19 NGOs involved in the project area. 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 16). Women's are mainly focused on NGO credit programs.. It was seen that local people also take credit locally from neighbors, relatives and sometimes from Mohajons (Money Lender) etc.

Table 10. List of	Table 10. List of NGO and their union-wise activities					
Name of NGO	Activities	Location of Union				
World Vision	Health Care, Charity and Micro credit	All Unions				
ASA	Micro credit for agriculture, small business,	All Unions				
	poultry and livestock					
Grmeen Bank	Micro credit	All Unions				
YMCA	Help to young	Aushnara				
Buro Tangil	Micro credit	All Unions				
BRAC	Micro credit, education, health, awareness,	All Unions				
	poultry & livestock development					
CARITAS	Micro credit, education, health, handicraft,	All unions				
	spinning, poultry & livestock, legal support,					
	etc.					
CBSDP	Micro credit, trainings	Aushnara				
ADRA	Micro credit, education, health, awareness	Dowgow				
	program, etc.					
PROSHIKA	Micro credit, Livelihood	All unions				
RDSM	Water and sanitation program	Dowgow				
MCC	Handicraft	Aushnara				
SSS	Micro credit	All Union				
IPDS	Human rights	Auronkhola				
JADP	Human rights and lands rights, awareness,	Auronkhola				
	legal support, etc.					
AMS	Women human rights, empowerment, lands	Sholakuri				
	rights, etc.					
SEMP	Medicinal plants cultivation, processing and	Auronkhola and Sholakuri				
	marketing					
DF	Health program	All unions except Nowgow				
		and Rangamatia				
BICHARAN	Improved stoves / woven	All unions				

Table 16. List of NGO and their union-wise activities

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4.7.9 Note worthy Organization

SEMP (Society for Protection of Medicinal Plant & Environment): This is a very renowned organization working in a eco-friendly manner. They have 1500 beneficiaries with 300 house holds. Their experiences and learning in forest resource protection, conservation and utilization of forest resources in a eco-friendly way would be good learning for IPAC.

4. 8 Stakeholder Assessment

At least 3 categories of stakeholder could be recognized in IPAC Madhupur 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

4.8.1 Primary Stakeholders (PSH)

Table 17 provides information on stakeholder type & category, stakeholder description, their activities, dependency, relative level of stakes, potential strategies for obtaining support or reducing obstacle with the wetland and their impact on the wetland resources. About 15 different primary stakeholder types, who directly extract different resources from the forest have been identified. Of them; Moholder, Illegal tree feller, Fuel-wood collector, honey collector, bamboo and cane collector, sun-grass collector, Fruits collector, Hunter or trapper, Vegetable collector, Medicinal plant collector, Pineapple collector, Banana collector, Lemon collector, House building materials collector as primary stakeholder.

4.8.2 Secondary Stakeholders (SSH)

Out of 21 stakeholders; Sawmill owner and operator, Furniture ownership, Brick field owner as secondary stakeholders.

4.8.3 Institutional Stakeholders (ISH)

Out of 21 stakeholders; Relevant Government Institutions, NGO, Institute of Ethnic people as institutional stakeholders.

4.8.3.1 Forest Department (FD)

Forest Department (FD) is directly involved with overall management of the forest at the local level. FD has the overall responsibility for management, conservation and development of the Madhupur Forest Area through planting, harvesting, patrolling and guarding the forest resource. The number of forest staff is inadequate for its management. There is a forest check post on the Tangail - Mymenshing highway at Madhupur Forest Area. Overall, FD plays a positive role in the protection of the RF, a few FD local staff and officials are alleged to be involved indirectly with illegal felling activities. However, this was not noticed by the PRA team. According to local people, FD staff takes money from fuel-wood and bamboo collectors to allow them to enter into the Forest.

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4.8.3.2 Local Community Organization (CBOs)

There are several CBOs that have stake with the community people, namely JADP (Joyenshahi Adivashi Unnoyan Parished), YM CA(Youngman Christian Association, IPDS (Indigenous Peoples Development Services), AMS (Ashik Mishik Society), etc. could be identified in the Project Area. These local organizations deal mainly with local problems and welfare, and cultural activities, not any environmental issues.

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Sl. no.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level of stake	Potential strategies for obtaining support or reducing obstacle	Remarks
01	Moholder (auctioneer for tree felling)	Direct/ primary	Some rich and influential people from the outside of the forest area	Legally clear fell forest through winning auction. In addition to timber trees, completely destroy all under storey vegetation. Mix some illegally felled trees.	Not dependent on the activity	Major	Awareness building about nature conservation	Clear felling practice of moholder is detrimental to forest biodiversity Fd gets revenue
02	Illegal tree feller	Direct / primary	Adult male from some villages, some laborer for clear felling, unemployed people from forest. Mostly poor.	Selectively fell the valued timber trees. Usually enter the forest at night. Reduce forest cover, thus destroy habitat They come from some nearby settlements	Many HHs entirely dependent on this activity Many depend partly on it for their livelihood	Major	Alternative income source should be lunched	They are mainly organized gangs. They are influenced by timber trader and moholder
03	Fuel-wood collector	Primary	Local poor people, Forest villagers (mainly men and women)	Collect dead trees, small trees, non-timber trees, tree branches, dead leaves etc. Cut, chop, bundle and carry away as shoulder or headload, sometimes use van, rickshaws	Many HHs dependent for HH use Many HHs sell for livelihood support, entirely or partly	Major	Alternative income source should be lunched and improve stoves should be set up	Fuelwood collector sometimes collect vegetable Tribal people collect bamboo shoot pay taka 5/- for each entry

Table 17: Stakeholder information of the IPAC Madhupur Project area

Sl.	SH name	SH types	SH description	Role / Description of	Dependency	Level	Potential strategies	Remarks
no.				Activities of SH		of	for obtaining support	
						stake	or reducing obstacle	
04	Honey	Primary	Local people, mainly	Collect from forest	Mainly for HH	Negligi	Alternative income	Usually it is not an
	collector		poor people	seasonally	consumption, sell	ble	source should be	intended activity
				and occasionally	surplus, but not		lunched	
					dependent			
05	Bamboo and	Direct /	Individual / group	Collect bamboo from	Not dependent	Major	Alternative income	Planted bamboo
	cane	Primary	Local poor, forest	forest for	Forest villagers		source should be	beds are also
	collector		villagers	domestic and commercial	partly dependent		lunched. Develop	auctioned and clear
				use			bamboo value chain	felled
							enterprise development	FD gets revenue from
	-							auction
06	Sun-grass	Primary	Forest villagers, local	Harvest and bundle and	Meet household	Mediu	Alternative income	Mainly forest
	collector		poor people, employed	carry as head load or	needs, some sell for	m	source should be	villagers, and people
			people.	shoulder load.	supplementing		lunched	from
					income during			
07	To to	D	T	M	harvesting season.	NL . 1		
07	Fruits	Primary	Local poor people	Mainly collect wild fruit.	Not dependent	Negligi	Aware the blodiversity	
00	Illumtor /	Drimony	Elite and rich from the	Mainly hunt come hinds	Ear IIII	Minor	Avvana tha hia divanzity	Earast wills same
08	funcer /	Primary	Ente and non from the	wild	FOI HH	MINOI	richnoss	traditionally used to
	trapper		area Ecrost villagers	four wild beer berking	Not dependent		Tienness	hunt avary type of
			area. Porest villagers	door snakes monkeys	Not dependent			wildlife Presently
				and others				their activity is
				and others.				limited
09	Vegetable	Direct /	In and out side	Collect vegetables, like	Meet HH needs	Minor	Homestead gardening	Forest villagers and
	collector	primary.	villagers, poor people,	kachu, Kitchen vegetable	Only Not		will be developed	most people from
		1 37	mainly Fuel-wood	etc.	dependent, also		1	outside villagers
			collector and		met from			
			occasionally the outside		homestead gardens			
			villagers		Ũ			

Sl.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level	Potential strategies for obtaining support	Remarks
10.						stake	or reducing obstacle	
10	Medicinal plant collector	Primary	Some local people	Some limited species, not on a large scale	Not dependent	Negligi ble	Homestead medicinal gardening will be developed	Sometimes, local kabiraj collect it
11	Pineapple	Primary	In and out side's forest villagers	Large scale	Dependent on this activity for livelihood support	Mediu m	Homestead gardening will be developed	Restricted to a designated area used by forest villagers, but no agreement
12	Рарауа	Primary	In and out side's forest villagers	Large scale	Dependent on this activity for livelihood support	Mediu m	Homestead gardening will be developed	Restricted to a designated area used by forest villagers, but no agreement
13	Banana	Primary	Forest villagers	Clear the area by weeding and then plant graft/saplings of lemon plant.	Dependent on this activity for livelihood support	Mediu m	Homestead gardening will be developed	Restricted to a designated area used by forest villagers, but no agreement
14	Lemon cultivator	Primary	Forest villagers	Clear the area by weeding and then plant graft / saplings of lemon plant.	Dependent on this activity for livelihood support	Mediu m	Homestead gardening will be developed	Restricted to a designated area used by forest villagers, but no agreement
15	House Building material Collector	Primary / Direct	Forest villagers and surrounding people	Collect various materials as per need for HHs building.	Partially dependent	Major	Introduce alternative materials using practice start	Restricted to a designated area used by forest villagers, but no agreement

SI.	SH name	SH types	SH description	Role / Description of	Dependency	Level	Potential strategies	Remarks
no.				Activities of SH		of	for obtaining support	
1.6	a	x 1 /		· · · · · · · · · · · · · · · · · · ·		stake	or reducing obstacle	
16	Sawmill	Indirect /	Individual / Group	Help in conversion of	Not dependent	Minor	Awareness	
	owner and	Secondary,		illegal				
	operator			timber and encourage				
				illegal				
				tree felling and trading				
17	Furniture	Indirect /	Individual / Group	Have a good link with	Not dependable	Minor	Awareness	
	owner shop	Secondary,		illegal				
				feller and encourage				
				illegal tree				
				felling by purchasing				
				illegal				
				timber mainly from saw				
				mills				
18	Brick field	Indirect/	Individual	Use fuel wood and small	Become established	Minor	Aware the	Presently no
	owner	Secondary,		timber, encourage illegal			environmental	encroachment is
				tree			degradation and they	taking place now
				felling having good link			should use coil instead	Once recovered and
				with illegal feller			of timber	again taken back
19	Relevant	Institutional	Group	They play positive role	Indirect	Major	Capacity build up	Improve all type of
	Government							facilities / supports
	Institution		~					
20	NGO	Institutional	Group	They play positive role	Indirect	Mediu	Capacity build up	They can support the
						m		main stakeholder by
								AIG

SI.	SH name	SH types	SH description	Role / Description of	Dependency	Level	Potential strategies	Remarks
no.				Activities of SH		of	for obtaining support	
						stake	or reducing obstacle	
21	Institute of ethnic people	Institutional	Group	They play positive role and trying to establish land right	Indirect	Major	Capacity build up	They can work with the assistance of all Institutional Agencies.

4.8.4 Furniture's shops, Insecticide's and Hormone shop, Sawmill, and Brickfield

The scenario of a limited portion of the project area consists a number of Furniture shops, Insecticide' and Hormone shop, Sawmill, and Brickfield which are highly unfriendly for environment and ecosystem.

Furniture shop: There are about 28 furniture shops in the project area from Kakraid, Pirojpur, Jalchatra, Pochis Mile to Sholakuri (Table 18). Many of them have no valid license for trading of timber. They usually receive sawed timber from sawmills and trade locally. It is alleged that they sometimes receive illegally felled timber from thieves and get sawed and sell it and thus help in the illegal felling of timber.

Insecticide's and Hormone shop: There are about 26 insecticide and hormone shops in the project area from Kakraid, Pirojpur, Jalchatra, Pochis Mile to Sholakuri (Table 18). Out of this list, most of the local small business shop sale insecticides and hormone.

Sawmill: There are about 05 sawmills in the project area from Charaljani, Brittibari to Pirojpur (Table 18). Also there are a number of temporary sawmill found in the forest area. All these sawmill are to some extent involved in illegal tree felling. Most of the saw-mill operates by generator.

Brickfield: There are about 03 brickfields in the project area from Charaljani (Table 18). Most of these brick-fields use forest woods as fuel. There fore, these brick-fields are also responsible for forest destruction.

Sl. No.	Description	Number	Area	Remarks						
01	Furniture	28 Nos.	From Kakraid,	Mainly depends on						
	shop		Pirojpur,	the resources of						
	_		Jalchatra, Pochis	Madhupur Forest						
			Mile	Area						
			to Sholakuri							
02	Insecticide's	26 Nos.	From Kakraid,	Most of the local						
	and Hormone		Pirojpur,	little shop sale						
	shop		Jalchatra, Pochis	insecticides and						
			Mile	hormone						
			to Sholakuri							
03	Sawmill	05 Nos.	From Charaljani,	Most of the						
			Brittibari to Pirojpur	operate by						
				generator						
04	Brickfield	03 Nos.	Area of Charaljani	Most of them						
				operate by wood						

 Table 18. List of Furniture's shops, Insecticide's and Hormone shop, Sawmill, and Brickfield

4.8.5 Timber Traders

There are about 33 timber traders in a limited area of the project area from Kakaid, Pirojpur, Jalchatra, Pochish Mile to Sholakuri who are involved with timber trading.
Many of them have no valid license for the trading of timber. They usually receive sawed timber from sawmills and trade locally. It is alleged that they sometimes receive illegally felled timber from thieves and get sawed and sell it and thus help in the illegal felling of timber.



Fig.19 Link of various stakeholders with Timber Traders

4. 8.5 Fuel-wood Traders

A number of fuel wood traders have been identified that have indirect stakes with the Madhupur Forest, collected fuel-wood from the local direct collectors. There are about 22 fuel-wood traders at Chorljani to Sholakuri Bazaar. Several trucks of fuel-wood is transported everyday from this area and majority of which come from clear felling and substantial fuel-wood also sold locally by the traders. The traders procure fuel-wood from the individual collectors, stack them and also sell it to the local consumers, while the others transport it by trucks, van, rickshaw, pickup, etc. The marketing opportunities have increased during the recent times at the local level. The fuel-wood is traded at the rate of Tk. 200 -300 taka per van which contain about 2 mounds.

4.8.6 Police

Police is main law enforcing institutions who have substantial stake with the forest. They patrol in the area and on the highway to enforce the overall law and order including forest protection laws. It was reported by local people as well as by the FD staff that sometimes Police develop a process of negotiation with the illegal tree fellers and other resource users. Forest cases are initially lodged with the local police stations.

4.9 Dependency of the Stakeholders on the Forest Resources

Traditionally, the local people are used to collect various resources from the Madhupur NP and other adjacent area. The entire ranges of the stakeholders could be broadly categorized into four groups (Table 19). Local sawmills and furniture shops depend to some extent on the legal and illegal timber from the nearby forests. However, their livelihood is not dependent on the supply of timber from the Madhupur NP. Similarly, the Moholders, who are involved with clear felling, are not also dependent on the timber from Madhupur NP. However, the local people who are employed by the Maholders and involved with illegal felling are entirely or partially dependent on the forest extraction activity for supporting their livelihood. Forest villagers are entirely dependent for fuel-wood and building materials for meeting HH needs on the forest. It seems that there is no alternate source for its supplies. They also collect vegetables, fruits and hunt some wildlife. But they are not dependent on these resources for their livelihood. The forest villagers are mainly dependent on pineapple, banana, papaya, hybrid mango and the lemon cultivation in the forest areas for their livelihood support.

Sl	Name of	Users Causes		Extent	Dependency	Risk
	Resources				of localities	
01	Timber	Moholder, illegal timber feller, Saw mill owner, Furniture Shops, Timber trader	Household use, building materials	High	25 %	High
02	Fuel wood and dead leaves	Local people, a few outside users (restaurant, brickfield)	Mainly commercial use (selling for livelihood) and HHs consumption (small amount)	Medium	32 %	High risks
03	Bamboo	Local people, outside users (as building materials)	As poles, fencing, basket and others, fuel	Medium	5 %	Moderate risks
04	Cane	Local users	Basket binder	Less	5 %	Less
05	Medicinal Plants	Local people, a few Kabiraj	As medicine	Less	2 %	Less
06	Honey	Forest villager, Local People	Food, medicine	very less	1 %	Less
07	Herbs	Local People	As vegetables	Very less	3 %	Less
08	Bird	Forest villager, Local People	For meat (wild fowl, Ghughu)	Very less	.1 %	High
09	Wild Boar	Forest villager (indigenous people)	Meat as food	Very less	1 %	Medium
10	Sun grass	Local people	Cattle feeding, house roofing	Less	10 %	
11	Fruit	Local People	Food	Very Less	5 %	Less
12	Vegetables	Local People	Food	Less	5 %	Less
13	Grass	Local People	For Cattle feeding	Less	5 %	Less

Table 19. Resource Wise Dependence of Different Resource Us	ers
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A large number of HHs of the identified villages depends on the extraction of fuelwood and building materials from the forest. It is the poor who collect these resources, mainly for their HHs consumption and also for selling. The poor people from the neighboring forest area collect fuel-wood and other NTFPs from the forest. Some HHs sells these for added income. Some of them involved with illegal felling of timber and thus are dependent on their forest extraction activity.

Table 19 shows the dependence of different stakeholder groups on different resources for their HHs needs and supporting their livelihood. Almost, all HHs of forest villages are dependent on the fuel-wood and house building materials, vegetables from the forest for their HH needs. But, they do not collect these for commercial purpose. Many poor people completely dependent on selling of fuel-wood and many of them sell it for added income. It was revealed from FGD with local people that about 15 % people from the nearby villages completely or partly depend on selling of fuel-wood. Almost all-illegal tree feller sells timber and many of them are completely dependent on it, while others do it for added income.

Fig 20 shows the relative level of dependence of different groups of people on the forest, i.e., the pressure exerted by the stakeholders on the forest. It is apparent from the figure that the local poor people including the ethnic forest villagers are dependent on the forest and at the same time they are the people who causing most harm to the forest. However, the activity of the forest villagers are mostly confined to the area allocated to them for lemon cultivation.



Fig. 20. Relative level of dependence of major stakeholder groups on the IPAC Madhupur Site

4.10 Causes for the Decline in Forest Resources

4.10.1 General cause

Based on the perception of the team developed through discussions with different cross sections of people in the area, a Venn Diagram is constructed on the major causes for the degradation to the forest and its biodiversity and is shown in Fig. 21 The major causes for the decline in forest in order of magnitude are as follows: clear felling and illegal timber felling, FD's plantation strategies, fuel-wood collection, collection of house building materials, hunting, bamboo and cane collection, etc.



Fig. 21 Major direct causes for the degradation of IPAC Madhupur Site

Pair-wise ranking (Table 20) exercises showed that presently clear felling practice is the major cause for the decline in forest biodiversity, followed by illegal timber felling, fuel-wood collection and bamboo collection. Presently, hunting contributes negligibly as the activity is very limited. The role of FD's plantation strategies for the forest degradation has not been explored.

	Clear felling	Illegal	Fuel-wood	Bamboo	Hunting
		felling	collection	collection	
Clear		Clear	Clear	Clear	Clear
Felling		felling	felling	felling	felling
Illegal felling	Clear felling		Illegal	Illegal	Illegal
	_		felling	felling	felling
Fuel-wood coll.	Clear	Illegal		Fuel-wood	Fuel-wood
	felling	felling		collection	collection
Bamboo	Clear felling	Illegal	Fuel-wood		Bamboo
collection	_	felling	collection.		collection
Hunting	Clear felling	Illegal	Fuel-wood	Bamboo	
_		felling	collection	collection	
Rank	08	06	04	02	00

Table 20	Pair Wise	Ranking fo	r Identifvi	no Main	Causes For	Forest	Destruction
1 abic 20.	I all wisc	Nanking IU	1 Iuchinyi	ng mam	Causes For	I UI CSU	Desti action

In order to investigate the underlying factors responsible for undertaking of these forest degradation activities by the local people cause and effect ranking was done and the outcomes are shown in Table 21 and Table 22. The exercises revealed that local poverty and unemployment are the main driving factors for the extraction of forest resources, followed by additional income needs and squeezed income

opportunities. Excessive forest cases lodged by the FD and lack of some local resources are also driving the people for increased timber felling and including building materials (Table -21).

Table 21. Cause and Effect –Ranking (Understanding Underlying Facts for Forest Degradation)

Name of resource Identified problems	Timber to sell	Fuel-wood collection	Bamboo & cane sell
Poverty	0000	0000	0
Unemployment	000	000	0
Additional income needed	00	00	00
Lack of house building material			00
Forest cases (in Madhupur NP)	00		
Income opportunities squeezed	00	0	0

FD's poor forest patrol, easy negotiation with local FD staff, poor strength of local FD and emergence of increased local influential people are all contributing to illegal timber felling. Fuel-wood collection has been linked to development of transportation system and marketing opportunities and drop in solvency level (Table 22).

 Table 22. Cause and Effect (Investigating FD's Management Practice and Local Situation)

Practice/Management	Timber to sell	Fuel wood	Bamboo and cane
Practice		collection	collection.
Poor forest patrol	00000	00	00
Easy negotiation	00000	00	0
Poor strength of FD	00000		0
/increased local strength			
Transportation dev.	000	000	0
Traditional practice	0000	0	0
Increased role of local	0000	0	-
influential people			

A summary of information collected on resource exploitation from Madhupur NP Forest are provided in (Table 17). A total of 11 different types of resource are extracted from the forest. Of them, timber (includes both legal and illegal extraction),fuel-wood, coppies dead leafs are extracted on a large scale, bamboo and building materials on a medium scale, wildlife, fruits, vegetables, sun grass etc. on a minor scale, while honey, cane, medicinal plants on a negligible scale. Fig 22 shows the major resource extracting zones of the reserved forest. The main purposes for resource extraction include meeting HH needs, selling for added income/and or to support and supplement livelihood. Timber felling, fuel-wood and bamboo collection,

collection of house building materials, hunting etc. all are posing threats to the forest and its biodiversity through bringing qualitative and quantitative changes in the habitat and the wildlife they support. Moholder, local poor people, forest villagers and unemployed laborer are the major categories of resource user.

Sl.	Name of	Resource collector	Purpose	Extent	Impact	Future Risk	Destination
No	resources						
1	Timber	Moholder, local poor people from adjacent villages, unemployed people from surrounding village	For selling	Large	Reduce selectively large tree and forest thickness, loss of habitat and biodiversity	High	Local timber trader, sawmill, furn shop, urban areas
2	Fuel-wood	Local poor people, forest Villagers	For HH consumption and selling	Large	Loss of habitat, loss of forest biodiversity,	High	Local HHs, local markets, brickfiled, transported to urban areas
3	Bamboo	Forest villagers, some local poor people from neighboring villages	Meet HH needs Selling for added income	Medium	Wild stock already heavily depleted, further extract aggravate the situation	Moderate	Local HHs Local and nearby areas
4	Wildlife	Forest villagers Occasionally outsider	For consumption As hobby	Little	Stock heavily depleted	High	Local HHs
5	Building materials	Forest villagers Local poor people	Meet HH needs Selling for added income	Medium	Reduce abundance of small trees, loss of habitat, loss of wildlife	Medium	Local HHs Local markets
6	Honey	Local people	Own consumption	Negligible	None	Negligible	
7	Cane	Local people	HH use	Negligible	Little collected as they are not much available	Presently negligible	FD has many cane plantations
8	Fruits (Pine apple, Banana)	Local people, children and women	Own consumption, few for sale in the locality	Minor	Hamper forest regeneration to a little extent	Little	
9	Vegetables	Mainly forest villagers and local poor people	Collect number of species of vegetables	Minor	No apparent impact	Negligible	
10	Sungrass	Local people, forest villagers	Collect as house building materials	Presently little	Reduce forest biodiversity	Negligible	Removed in the process of plantations
11	Medicinal plants	Few local people, forest villagers	Occasionally collect some selective species	Little	Negligible	Negligible	

Table 23. Information on Resource Extraction from Madhupur NP

4.10.2 Seasonal changes in resource extraction

Table 24 shows the trend in forest resource exploitation by month. The exploitation of resources from the forest is season dependent. Most of the timbers are illegally felled during the rainy season as forest patrol is poor during that period. However, legal clear felling takes during the dry season. Fuel-wood is mainly collected during dry season due to easy accessibility and mobility inside the forest during that time. Bamboos extraction mainly takes place in drier months that corresponds to local needs for house building. Medicinal plants, vegetables and some other forest resources are extracted to some extent mainly during rainy season. A little amount of honey is also extracted during summer (Baishakh-Jaistha).

Name of	Bais-	Jaista	Ashar	Shra-	Vad	Ashin	Katrik	Agrah-	Poush	Magh	Fal-	Chait-
Resources	hak	Juista	Tishur	bon	ra	1 151111	1 uu ii k	ayan	1 ousii	in angle	gun	tra
Timber	00	000	000 00	00	000	000	000	000	00	00	000	000
Fuel Wood	000	000					000	00	000	000	0000	0000
Vegetables	0000	0000			····	0	0	0	0	0	0	0
Bamboo, building materials	0	0	0	0	0	0	00	0000	0000	000000	00000	00000
Medicinal Plants	00	00							00	00	00	00
Fish	-	-	-	-	-	-	-	-	-	-	-	-
Wildlife	0000	000	0	0	0	0	0	0	00	00	00	00
Honey	0	0	-	-	-	-	-	-	-	-	0	0

Table 24. Seasonal Calendar of Resources Exploitation in Madhupur NA

4.10.3 Important Resource Exploitation

4.10.3.1 Fuel-wood collection

Extensive fuel-wood collection is another practice in the reserve area that poses a threat to the forest biodiversity. This is a major and very visible activity in the Madhupur NP. It is a year round activity, but major extraction occurs during the dry seasons. Fuel-wood is collected both for household consumption and for commercial purposes. Most of the collectors are adolescent boys and adults; both male and female. Most collectors are poor and supplement their income by selling fuel-wood. Some fuel-wood collectors have substantial linkage with illicit feller and act as informative persons.



Fig. 22: Flow of extracted fuel-wood from IPAC Madhupur Site

4.10.3.2 Timber extraction

Although timber is extracted in both illegal and legal way, timber extraction is regarded as the major cause for the destruction of Madhupur NP. Many people from the surrounding villages of Madhupur NP are directly involved with the illegal extraction of timber from the forest. The villages such as Pirghacha, Chunia, Joynagacha, Bandharia, Jhalabada, Sadupara, Goira, Joloi, Telki, Rajbari, Gachua, Baribaid, Magontinagar, Jangalia, Jhalchatra, Gachabari, Amlitola, Bhutia, Aronkhola, Pegamari, Sholakuri,

Bhutia are mainly involved in this activity. In other villages, the number of timber poachers is few. Most of them poachers are poor.



Fig. 23: Relative stakes of different villages with illegal felling

Timber is extracted from the Modhupur NP by two ways. One is legal way by clear felling, through auctioning by FD. FD auctions outdifferent forest coupe/block for clear felling to auctioneers, locally called *Mohalder*. Another is by illegal felling. It is claim by the local people that illegally felled trees are smuggled out along with clear felled trees by the *Mohalders*. Besides various groups of people are involved with illegal felling. Fig.25 shows that the illegal fellers have linkage with different parties, including police, administration, local political leaders, FD etc.Both legal and illegal

timbers are sold in the local market such as Modhupur, Kakraid, and Garobazar. Then it transported to the various places of the country such as Mymensingh, Dhaka, Tangail etc by truck, bus etc

Different law enforcing agencies, such as police and FD check illegally felled trees at different posts. As per local people that the traders manage to pass through the check posts. It appears that local Police play a negative role in this aspect.



Fig. 24: Linkage of various stakeholders with illegal fellers

4.10.3.3 Bamboo extraction

The process of the extraction of bamboo is more or less similar to timber extraction from the Madhupur NP. The FD auctions out different forest coupe/block of bamboo called Bash (bamboo) Moholders (auctioneers) at every two to three years. On the other hand forest villagers, local people collect bamboo illegally. However, there are groups of people who are habituated with collection of bamboo either legally or illegally.

4.10.3.4 House building materials collection

House building materials are collected at a small scale from this forest, though this forest is situated not far away from the settlements. The forest villagers collect their entire house building materials from the forest, predominantly from their pine apple cultivation areas as they claim. The Madhupur NP area is also widely used by the surrounding rural population, and people from the identified villages for collection of building materials. However, collection of building materials by them is not much. The building materials collected is mainly small trees, sometimes young trees of valued timber trees. Bamboo is also used as building materials for their houses.

4.10.3.5 Other Resource Collection

Different resource users also collect various other resources from the Madhupur NP. Cane also collected at a negligible quantity from the forest. There are people in the adjacent villages of RF who collect vegetables and fruits from the forest. The vegetables collected include bamboo shoots (manthana), bonkachu (bandhugi), ramkala, thankuni, aorai kalai, karam, gantha, muia, palong shak kachu,kachur lati, etc., mainly during rainy season. Very few villagers are involved with this activity. In addition, few people collect seasonal fruit from the forest. The main forest fruits that are collected by people are *Chapalish, Kau, Kanthal*, cane fruits and banana. The fruit collectors mainly collect these fruits for their own consumption. A few of them probably sell them to their neighbors or to markets for additional income. In addition, there is irregular hunting of jungle fowl and wild boar by the people or HH consumption.

4.11 Other causes for forest degradation

Pine apple cultivation

Pine cultivation is done by the Forest villagers in Madhupur NP, allocated by the FD the purpose. This is their traditional activity and is the major source of income. The cultivation practices include clearing of the area and subsequent weeding. Thus the activity contributes to habitat loss and pose a threat to the local biodiversity.

4.12 Local Community and Power Structure and Local Governance

4.12.1 Local decision makers and influential people

Many influential people have control over the local people, their activities and even over local administration. Some of them have linkages with the illegal tree feller.

412.2 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, the Gram Sarker (Village Government), in each ward (village) and deal with all local issue, including welfare, development and dispute and conflict. Police administration at Upazila level is the local law enforcing agency and are involved with maintaining local law and order situation. The Garo people have their traditional way of governance of their community. They are very organized community having respect to their community leaders. Forest villagers have governance system of their own. In Madhupur NP in the forest village, there is a community leader, called Headman, as recognized by the FD. Fig.26 shows the relative involvement of different Government and administration



Fig. 25: The relative level of stake of different institution

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4.12.3 Local conflict, conflict resolution, social adhesion and cohesion 4.12.3.1 Sources of conflict

The main sources of conflict among local people are, land dispute, children affairs, livestock grazing, marriage related affairs, family affairs, money lending, local politics, local elections etc. Fig. 27 Venn Diagram: Sources of conflict

4.12.3.2 Conflict resolution

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



Fig. 26: Venn Diagram: Conflict resolution

4.12.3.3 Conflict with FD

There is a huge conflict between with FD local staff and local people, particularly with tree feller from various villages. Sometimes there are direct conflicts with tree feller during patrolling, sometimes lead into exchanges of fire and even murder.

412.4. 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, Adivashi festival collective action through local community organizations, etc.

4.13 Local Socio-economic Context

4.13.1 Demographic Profile

4.13.1.1 HHs

In total, there are approximately 71,051 (Table 10) in the identified villages having major and medium level stakes. Information regarding households for some villages was not collected. Of them, only 2,163 HHs belong to Adivashi forest village.

4.13.1.2 Education

Among the tribal community, now-a-day's 90% children go to primary school, only 25% go to High School and only 10% study in the colleges. Among the adult, about 40 are illiterate (above 30 years of age). Among the Bengalee, approximately about 50-60% adult are literate, about 80-85% children go to primary school, about 60% goes to high school and about 25-30% goes to colleges.

4.14 Livelihood analysis

4.14.1 Occupation

The major occupations of the tribes are day labourer followed by fuel-wood collection, pine apple and banana cultivation. Almost all HHs of tribe are engaged with some sort of agriculture cultivation, business and service (Table 25). On the other hand, the major primary occupation of Bangalees are agriculture (approx.65-70%), principally paddy cultivation, followed by day labour including (22-25%), fuel-wood collection and timber poaching (4-5%), small business (2-3%), service (5%) and overseas employment (2%). The major secondary occupation is fuel wood and bamboo collection (5-8%), day labour (5-10%).

Sl	Occupation	Before 1971	Before 15	Present
			Years	
01	Agriculture	00	0000	00000
02	Day Laborer	00	000	0000
03	Business	00	000	00000
04	Fuel wood Collector	00	000	00000
05	Illegal Poacher/tree feller	00	000	00000
06	Service	0	00	0000
07	Timber Trader	0	00	0000
08	Carpenter	0	000	0000
09	Sawmill operation	0	00	0000

Table 25. Trend in Changes in Occupation of People around Madhupur Forest

Table. 26 Livelihood Status of The Adjacent Villagers of Madhupur NP Forest

SI.	Villages	Rich	Mid.	Poor	Extreme
No			Class		Poor
1.	Berybaid	5%	35%	45%	15%
2.	Magontinagar	3%	17%	60%	20%
3.	Jangalia	1%	10%	85%	4%
4.	Gachua	2%	5%	73%	20%
5.	Rajbari	1%	4%	85%	10%
6.	Jalchatra	10%	25%	40%	25%
7.	Gachabari	15%	20%	45%	20%
8.	Pagamari	1%	2%	85%	12%
9.	Bhutia	5%	15%	65%	15%
10.	Chunia	5%	20%	45%	30%
11.	Pirgacha	10%	30%	40%	20%
12.	Joynagacha	5%	20%	55%	20%
13.	Baduria	5%	25%	55%	15%
14.	Sadupara	3%	17%	60%	20%
15.	Gaira	5%	35%	40%	20%
16.	Telki	2%	18%	60%	20%
17.	Average	4.90%	18.60%	58.60%	17.90%

4.14.2 Richness-poverty level

4-5% people of the area are rich, 20-25% are middle class and 50-60% is poor and 15-20% is very poor. However, among the tribal community, poverty level is very high (Table 26).

4.14.3 Unemployment

Unemployment is another severe problem that puts pressure on over exploitation of forest resources. Among the villagers, about 10-15% 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.

4.14.4 Credit

Several NGOs 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. NGO credits are mainly focused on women. It was seen that local people also take credit locally from neighbors, relatives etc.

4.14.5 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, particularly the tribal, have got some skills, like bamboo basket and mat making, weaving. There are areas such as bamboo and cane handicrafts preparation, food processing and marketing, medicinal plants production and its marketing, cattle fattening, poultry, dairy, pineapple and banana cultivation 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 forest and at the same time very soft loan would help in undertaking these activities.

4.15 General Dynamics

Table 27 shows the changes in some key socio-economic factors and local activities. Compared to 1970, there has been an increase in 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 forest for both as HH needs and income has increased. However, local food scarcity has reduced while opportunities for alternate income have increased.

Issue	Pre-	15	Present	Causes for change
	1971	years		
Settlement/population	0	ago 000	00000	Population growth,
Solvency	00	000	0000	Livelihood expenditure increased and also income
Livelihood expenditure	00	000	00000	Increased price of goods, use of increased commodity
Literacy	0	000	0000	Awareness raising, educational opportunity increased
Unemployment	0	00	00000	Less cultivated land than pre- 1971, case in forest village, population growth, resource depletion

 Table 27.Trend in Changes in Some Socio-Economic Matrices of the Local

 People

Use of forest for income	00	000	00000	Poverty, unemployment
Use of forest for HH needs	00	000	0000	Poverty, Population growth, easy access and no alternate source
Transportation and mobility	00	000	0000	Development of communication and transport road
Homestead plantation	0	00	0000	For income generation, HHs consumption, awareness
Food scarcity	00000	000	00	Increased employment opportunity and agricultural development
Credit and IGA	-	-	00	Increased GO, NGOs credit and IGA programs
Occupation	0	00	00000	Increment of IGA and small business, day labour in forest

4.16 Seasonal changes in socio-economics of the local people

Table 28 provides information on monthly changes in some socio-economic parameters and some resource extraction activities. Unemployment is higher during Baishakh-jaisthaand during Poush-Magh. Timber felling is more during wet season while fuel-wood collection is more during dry seasons. In summary, except timber felling, most forest resource extraction and related activities take place during dry months. Timber felling is inversely related to forest patrol. While there appears to be no direct link between seasonal unemployment and dependence on the forest resources, this is thought to be acausal factor in dependence.

	Baishalz	Inisthyn	Achar	Shrahan	Vodro	Achvin	Korti	Agrah	Dou	Magh	Fol	Chai
	Daisiiak	Jaistiya	Asilai	Sillabali	v aur a	Asiryin	k	ayan	sh	wiagn	gun	-tra
Unemplo yment	0	0	00	000	00	000	000	0	00	0	000	000
Accessibi lity to forest	00	00	000	000	0	0	0	00	00	0	00	00
Transport ation problem	00	00	000	0000	0000	000	00	0	0	0	0	0
Brickfiel d/saw mill operation	000	00						000	000 0	0000	0000	000
Forest patrol	0000	000	00	00	00	00	000	0000	000 0	0000	0000	0000
Agricultu ral activities	0000	0000	0000	0000	00	0	0	0	00	00	00	000
Timber felling	000	0000	0000	0000	0000	000	000	00	00	00	00	00
Fuel- wood collection	0000	000	00	00	00	00	000	0000	000 0	0000	0000	0000
Bamboo	00	00	0	0	000	00	00	000	000	000	00 0	000
Building materials	00	00	0	0	0	0	00	00	000	000	00	00
Hunting	0	0							0	0		
Vegetabl e collection	000	000	0	0	0	0	00	0	0	0	00	00

Table 28. Seasonal Changes in Some Socio-Economic Matrices

4.17 Local Problems

Problem ranking exercise (Table 29) was performed to identify and understand the locallevel problems and its causal factors. The major problems, according to the magnitude, are poverty, unemployment, electricity, drinking water, forest, cases etc.

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
Drinking water	Scarcity of fresh water in dry season due to water level goes down	Need Government and NGO efforts to provide tub well and technology for safe water.
Electricity	Limited & interrupted electricity supply that hampers public life and also irrigation	Electricity should be supplied through Polly Biduth or PDB or introduce solar energy system
Forest case	Cases lodged by local FD against illegal resource extraction and also sometimes causes against to innocence personal	Illegal use of forest resource should be stopped. FD should not file any case based on falsehood.

Table 29. Local Problem and Their Causes and Possible Solutions

A collation of problem rankings carried out during the PRA showed that poverty is cause for the use of forest (Table 30).

Identified problems	Poverty	Unemployme nt	Food security	Income needs	Fuel-wood scarcity	Scarcity of house build. mat
Poverty		Poverty	Poverty	Poverty	Poverty	Poverty
Unemployment	Poverty		unemploy ment	Income needs	unemploy ment	unemploy ment
Food security	poverty	unemployment		Income need	Food security	Food security
Income needs	poverty	Income needs	Income needs		Income needs	Income needs
Fuel-wood scarcity	poverty	unemployment	Fuel- wood scarcity	Income needs		House mat build.
Scarcity of. HH. build mat.	poverty	unemployment	House build. mat	Income needs	House build. mat	
Total	10	06	02	08	01	03
Rank	1	3	5	2	6	4

Table 30. Pair wise Ranking of Some Local Problems

4.18 Gender Issue

4.18.1 HH decision making

Table 31 and Fig. 28 shows the relative level of influence of different members of the family in decision making. In Modhupur NP area, the husband takes the major HH decisions, followed by wife and sons. Daughters are rarely consulted in decision making. Women of ethnic community have a major role in many HH decisions making.

Name of decision	Husband*	Wife	Father	Mother	ElderBrot her	Younger Brother	Son	Daugh ter
Marriage	00000	0000	0000	0000				
Sowing crops	000	00	0000	00				
Land purchase	00000	0000						
Land selling	00	0000		0000				
Treatment	00000	0000						
Education	00000	00000	0000	0000			0	0
Tree selling	000	000	0000	0000				
House making	00000	00000	000	000				
Cattle Purchase	000	0000						
Loan	00000	0000						
Savings	00000	0000						
General expend.	00000	00	000	00				

Table 31 . Information on Family Decision-Making (Gachabari)



Fig. 27: Ven diagram of Family decision-making

4.18.2 Outdoor mobility and access to credit and IGA

Table 32 shows that 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. But in the ethnic community, this picture is quite different, women are more involved in

earning.

Table 32. Mobility and Participation in Social Events and Access to Credit and
IGA by Male and Female in Madhupur NP Area.

	Outdoor mobility	Participation in social events	Access to credit	Access to IGA	Education	Employment
Male	00000	0000	0	0	000	00
Female	00	00	00	00	00	0

4. 18.3 Workload of Local Male & Female

Generally, the in the Bangalee community, men have more work during Jaistha to Bhadraand again during the winter months. The females have more work during the dry months and the periods that correspond to the local agricultural activities. However, in the tribal community the women have more work than men except the month of Agrahayan. In general, women in the locality have a lower workload than the men.

4.18.4 Daily work load

Fig. 29 and Fig. 30 show the daily work chart of male and female, respectively, in a Garo family in Modhupur NP forest village. The females are typically involved with the household work, agriculture and also help in the weaving and outdoor work. The males mainly do the outdoor works related to income generation.



Fig. 28: Daily Workload Chart of Men of Madhupur NP



Fig. 29: Daily Work Chart of Women of Madhupur NP Forest village

4.18.5. Education

The overall literacy rates of male and females are 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 (Table 33). 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.

Overall literacy (based on adult)		Educational level (based on students)						
		Primary	Secondary	Colleges	Above	Informal		
Male	0000	0000	00	00	0			
Female	000	0000	000	0				

Table 33. Comparison of Educational Status of Male and Female in Madhupur NP

4.19 Local Level Awareness and Behavior

Local people know about some of the rules of forest Acts, but most of them do not know the significance of the National Park. About 50% people are aware of the National Park and many people know about some restrictions in the National Park. Compared to male, female are less aware of it. In Madhupur National Park, people are aware about the degradation to forest and forest resources and its adverse impacts. They have a positive attitude towards conservation. However, local people know little about rules, regulations for the use of the reserved forest. Initial response of local people and FD staff towards the project was positive. As per local people, alternate income generation provision for the local poor people would be helpful for the successful implementation of the project. The ethnic community is well behaved and cooperative. Most of the local Bangalees are also good people. However, some of them are rude. Some people expressed their concern that if the program affects the livelihood of local people they will not cooperate and may oppose the program. Initial response of the local people and FD staff towards the project is very positive and villagers are willing to cooperate.

4.20 Resource Regeneration & Plantation Practices

4.20.1 FDs Plantation / Product forestry by FD

The plantation policy for the Modhupur National Park forest appears to be concentrated on the production of timber, cane, bamboo and some other forest products, with planning, establishment, management and harvest under the centralized control of the Forest Department. FD records show that plantation in Modhupur National Park Forest started in 2002 under FSP (Forestry Sector Project). Initial plantations included only long-rotation plantation, primarily with teak and conspicuous tree species. FD records shows that about 28 species of trees were used in planting the forest. Intensive plantation of the forest occurred during the period 1983-1990. The later plantations include mainly short-rotation monoculture plantations mostly with exotic and rapid growing species. The commonest species for the short-rotation plantation are Acacia, Mengium, Eucalyptus, etc. The FD has also planted cane and bamboo in a substantial area.

Plantation practice: Plantation of the forest included clear felling of the original forest, burning of underneath vegetation. Although illegal logging has been stopped in the natural forest, FD continues to clear cut the mature plantations both inside and in bordering of the reserves. It was expressed from an FGD that the FD's plantation

strategy for Modhupur National Park is still guided by the production forestry. Along with the traditional plantation practice with valuable long rotational timber trees, present plantations in Modhupur National Park include Jarul, Chapalish, Agar, Garjan, teak, as well as short rotation exotic trees (i.e Acacia hybrid, Mangium, Moluccana, Euclyptus, Pine, Akashmoni) with mono species. Beside this bamboo and cane have been and being planted in many blocks. Cane is planted as undergrowth which has started from 1997. The FD also continues to cut under story vegetation in the natural forest in order to plant bamboo. Although not quantified, this practice has a significant negative impact on regeneration and forest succession. These practices resulted in the earning of huge amount of government revenue. Changing these practices may be difficult given the amount revenue generated.

4.21 Law Enforcing Mechanisms

In Madhupur National Park, forest patrol is inadequate and FD staffs are not capable of facing the armed gangs of illegal timber extractor. As revealed from FGD, forest check post at Madhupur National Park does not serve the purpose of checking illegal timber adequately. Sometimes forest cases are filed against innocent villagers and this activity fell them in the cycle. Local police takes lot of interest in enforcing law. However, according to local people, their enthusiasm in forest protection goes against the forest conservation. Local people claim in FGD that police patrols around the forest but not for forest conservation purpose, for their own interest for getting money. Often police impose per van of Tk. 10 for each fuel-wood collector and a big amount of money for each trucks with illegal timber. According to the FD and local community they are helpful and cooperative in this aspect.

4.22 Status and Role of Forest villagers and ethnic community

There are 21 forest village located inside and surrounding the Madhupur National Park inhabited by an ethnic community called Garo, Bormon, Koch (Mandi) they were allowed to settle down within the Madhupur National Park area, but have no formal agreement. The FD mainly maintain cooperative relation for strengthen their forest patrolling with the help of the forest villagers. They have only their homestead land. They cultivate pine apple and banana in an area around their village, informally allocated to them for the purpose. The maximum villagers dependent on forest's resources. They collect vegetables; house building materials and fuel-wood from the Madhupur National Park. At present 45% of the Garo are day laborers. On the other hand, though they are fully dependent on forest resources for their livelihood but due to a small number of populations, this has overall little impact on the Madhupur National Park. There have no innate tendency of encroaching land or establishing new settlements inside the Madhupur National Park. But they expect to get some more few new lands for establishing new HHs for their expanding family members, also they have some expectation from the project that IPAC should provide some support to improve their livelihood development strategies.

4.23 Background of Social Forestry (SF) in Bangladesh

4.23.1 Importance to Introduce Social Forestry in Bangladesh

Forestry in Bangladesh has been a continuation of British and Pakistan policy which was commercial in nature, state-centric and devoid of people's participation. On the contrary when the destruction of forest resources became very much visible then policy makers start thinking to compensate this destruction process. And thus the idea of introducing Social Forestry program evolved. SF emerged as an alternative Income generating approach for the forest dwellers. The salient features of SF are:

- Conserve and protect the forest
- Participatory model of management
- Encouraging people's participation
- Equity & efficiency

4.23.2 Major component of Social Forestry in Bangladesh

- woodlot plantation to be established on *Khas* (government owned) land
- Agro-forestry, 3.5 acres of land allocated to each participant household
- strip plantation
- Village nurseries

To materialize it

NGO played crucial role in mobilizing groups, to plant, to select species of trees, land allocation and women's involvement.

4.23.3 Complex land structure implementation of Social Forestry in Madhupur

- FD began SF as ADB-assisted project in 1989-90.
- More woodlot & agro forestry. Shal trees cut for woodlot plantations & agro forestry
- Natural Shal trees were cut to plant fuel trees (e.g., Eucalyptus, Mengium, Acacia)
- Seed selection by FD but implemented under the rhetoric of participatory development
- Removal of forest dwellers right to forest produce
- Threatened livelihood led to resistance; FD officials dual roles as police and promoters of SF

4.23.4 Land ownership and Forest Rights

- Social Forestry Project (SFP) failed to recognize the importance of common land. Did not take into account of traditional customary ownership
- Although SF implied "bottom-up" approach, appears to remain stateoriented.
- FD contradictory roles as both 'protectors' & 'exploiters'
- Participants are 'beneficiaries', not active agents of change
- Not conservation, regeneration, rather afforestation with commercial trees
- In the face of such complex scenario, it is ironical that FSPs in Bangladesh is yet to become "social".

5. Threats, Issues, Opportunities and Challenges for the IPAC Madhupur Site

5.1 Threats to the IPAC Madhupur Site and its Biodiversity

5.1.1. Clear felling and illegal timber felling

Matured plantations are cleared felled through a process of auction. The auctioneers are usually the local influential and very powerful. They cut everything within their auctioned area. They remove the herbs as well as to facilitate carrying and transportation of logs. It is alleged that some timber illegally felled are also smuggled out along with the clear fell timber. Widespread timber felling in the past caused to the reduction in the forest coverage, but was replanted with short rotational plantation. Timber felling is still widespread within the Forest and selectively large trees are removed. The entire process poses most threat to the Forest.

5.1.2 Collection of fuel-wood, bamboo and other house building materials

Collection of fuel-wood, bamboo and house building materials are widespread within the Forest and remain as important threat to the biodiversity of the Madhupur Forest Area. The collection of these forest resources removes the indigenous, non-traditional timer and small trees and shrubs. All these contribute to forest degradation and poor abundance of these exploited species.

5.1.3 FD's production of forestry

FD aims at increasing the valuable timber trees to get the maximum biomass from the forest. Therefore, plantations are done with short rotational tress of rapid growth. Very often, exotic monoculture plantations are done. They also plant bamboo and also cane as undergrowth. This causes a great threat to the diversity of both plants and animals. Plantation practices include clearing of land and subsequent weeding to facilitate plant growth. These practices also hamper the natural regeneration of the forest and reduce the biodiversity.

5.1.4 Hunting

Widespread hunting in the past contributed greatly to the reduction in wildlife diversity in the Madhupur Forest. Hunting is Madhupur Forest in now comparatively less than previous time, mainly because of unavailability of wildlife. However, some level of hunting is still done. The local ethnic community hunts / traps some wildlife; the important species sought are wild boar, jungle fowl and some species of birds. It is reported that sometimes people from distant places come to the forest for bird hunting. Therefore this poses a threat to the wildlife of the Madhupur as their population is now highly reduced.

5.1.5 Unplanned tourism

A good number of visitors come to the Madhupur Forest during the winter, mainly for picnic purposes as well as nature observation. They enter the forest and walk through. They cause disturbances to wildlife.

5.1.6. Proceedings against forest resource users

To protect and conserve forest resources FD suite several proceeding against forest dwellers. This is common scenario. Almost all the forest resource user is facing proceeding against them. Sometimes, one resource user has to face more than one proceeding, even more than 100 in some cases! To meet up the expenses of proceedings against them, they are compelled to earn more money by involving them illegal activities such as tree felling, fuel-wood collection, poaching.

5.1.7 Lose of habitat

Lose forest habitat are mainly due to encroachment, tree felling, lit fire in the forest, etc.

- Encroachment: Encroachment is one of the main reasons for forest habitat degradation. This occurs by expansion by agricultural lands, development of new settlement, and through establishment of industries. Almost seventy percent of forest habitat due to such practices since last four to five decades.
- **Tree felling:** Tree felling specially the timber wood of felling is very common in IPAC Madhupur Site. There are some poaches that used to do such practice for their quick and cash earning. They used to sell timbers in neighboring sawmill or furniture shops. However, timber wood becomes already scarce in IPAC Madhupur Site due to such illegal exploitation. Due to loss of tall timber trees birds like vultures, kites, cairns, parrots, already disappeared from the site.
- Lit fire in the forest: Lit fire in the forest common phenomenon in the IPAC Madhupur Site. This usually done by local non-ethnic people to collect fuel-wood easily. Also due to ignorance about conservation of forest resources, people do such practices without thinking of its fetal effect. When fire lit in the forest, all the subsoil insect and other flora and fauna destroyed. At that time, swarming of underneath insects and subsoil fauna occur and destroys in the fire. This intern makes the ecosystem imbalanced. Most of the medicinal herbs and shrubs close to extinct due to such practices.

Combined impacts of above mentioned cause's biodiversity of the area decreasing day by day alarming rate.

5.2 Issues of Concern

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

5.2.1 Reduced forest regeneration: Mainly caused due to fuel-wood collection, clear felling etc. Regeneration is required for bringing back wilderness in forest and it should be major option for the management of the forest.

5.2.2 Unsustainable resource exploitation: Mainly included collection of fuel-wood, bamboo, building materials, some species of wildlife etc. and causing depletion in biodiversity. IPAC needs to address this issue.

5.2.3 Local dependence on forest resources: Almost all inside HHs (mainly ethnic community) and many HHs from nearby settlements depend on fuel-wood, bamboo and other building materials for HHs needs and many HHs depends on it for their livelihood. Use of forest by local people causing harm to biodiversity. Thus this emerges as an issue of concern for the project.

5.2.4 Poor forest management by the FD and lack of specific Management Action Plan

5.2.5 Local poverty and unemployment: Local poverty and unemployment have been identified as the driving forces for the illegal forestland 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 forest 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 forest protection and role of local police administration: Forest patrol is inadequate to check illegal tree felling. Help from the other local law enforcing agencies is not adequate; rather the activity of local police is not conducive to forest protection and encourages the illegal tree feller.

5.2.8 Changes in the landscape: Land erosion, land leaser, different types of cultivation with in forest area practice, reduced forest area, siltation of rivers and canals, sedimentation, etc. brought a change in the original landscapes and its associated elements in between past and present.

5.3 Challenges for the Project

The possible challenges for the project are:

- **Boundary demarcation:** There is no specific demarcated forest area either publishes through gazette or declared by Forest Department. There should be clear demarcation as declared by GoB. IPAC can adopt can initiative in this regard.
- Occupancy right of forest dwellers on land use / forest resources: Forest Department or any other GO, NGO Agencies in past tried to implement several management practices. But these initiatives face strong protest from the forest dwellers as they were not aware about the merits of such activity. They thought that these activities will not establish their rights on land use and forest resources rather will reduce their right.

Before going to implement any management initiatives through CMC awareness raising and motivational activities would have to be introducing to IPAC end.

- Finalizing the legislatives status of Forest: Specific Forest Rules and Regulation declared in 1928. After that several amendments has been done but those were not sufficient to protect forest resources. These Forest Acts and subsequent rules should be more clear and indicative. IPAC can do advocacy in this regards.
- **Prohibition of indiscriminant use of forest resources:** Illegal tree felling, making fire in the forest, excessive fuel-wood collection, illegal establishment of small industry or structure in the forest land are causing rapid destruction of Madhupur Forest. FD has no declaration of prohibition about such activities. IPAC can provide support to FD to formulate very much specific declaration of prohibition.
- **Plantation under different project:** Several project supported by donor implemented / forestation without taking consideration of ecosystem acceptability. Instead of doing betterment of the forest, these activities rather caused harm to forest resources.
- **Replacement of planted forest by natural forest:** The planted forest as stated above need to be replaced by natural forest with indigenous species.
- **Transparency and Accountability:** FD and all concern GO & NGO Agencies need to ensure Transparency and Accountability in forest resources management activities.
- Empowerment of Forest Resource User Group: Forest dweller whose livelihood depends on forest resources should be organized in a forum (like

CMC, PF) and their voice should be raised and ensured in local as well as policy level decision making.

- Stopping fuel-wood, bamboo and building material collection: In the project area's people have a tendency to collect fuel-wood, bamboo and building materials try to collect form forest when they need. Even they don't care the presence of FD staffs.
- **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 FD's production forestry policy in favor of biodiversity conservation:** 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.
- Reducing use of chemical, fertilizer & insecticides: People are not aware about the negative impact on using of chemicals and insecticides in the crop fields. They even don't know how these practices causing fatal effect on aquatic biodiversity. IPAC would have to take the challenge to aware local community on these issues
- 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 comanagement.
- Ecotourism development: A large number of people visit the forest. If infrastructures are developed this will attract more visitors and ecotourism should be planned accordingly. Also security of tourist must be ensured. To develop ecotourism following activities can be introduced through IPAC.

Development of extension materials: This includes colorful posters, booklets, postcards, view cards, CD / DVE on Madhupur Forest, etc.

Easy Transportation facility from Dhaka and Mymenshing: FD and Bangladesh Parjoton Corporation can introduce luxury bus service for the tourist. Also private sector can be encouraged here.

Eco-cottage and other living facilities: Eco-cottage can be established in identified spots within and outside forest. Besides, a number of living facilities can be developed in Dokhola and Rasulpur Range.

Introduction of tourist vehicle: There is a road connection between Dokhola Range to Rasulpur Range that traverse through the middle of the forest. This route will attract to the tourist open vehicle can be introduce with guard and guide.

Handicraft of forest resource: Bamboo, cane, reed, and other forest materials can be use to made attractive handicraft. This will attract tourist and this kind of activities can be introduced as AIG activities among the forest dwellers.

Tourist shop: Tourist shop can be develop by organizing local people and can be provide credit from banks / NGOs.

Eco-guide: A number of Eco-guide group can be organized with the involvement of ethnic people. This also may inter become a livelihood option for the forest dwellers.

Forest patrol group: Local young people can be motivated to serve as forest petrol member. This is a voluntary activity. However heavy sticks, dresses, gumboots, umbrella, tourches, hand-mikes, whistles, can be provided them for their encouragement.

Organizing ethnic cultural show: A number of ethnic cultural group are active in the project are they can be organized and encourage conducting cultural activities.

However, before thinking to introduce eco-tourism in Madhupur Forest we have to deal very carefully with Adivashi Ethnic Groups and local people. So far, it is understood that, they are not in favor of eco-tourism in Madhupur Forest. They have a miss understanding that, if eco-tourism developed they might loose their land use and resource use rights. It is to be noted that, stapes were taken from FD to develop Eco-Park but failed at one step due to vigorous obstruction from local people, especially ethnic groups. In this contest another miss happening can be noted, which that a ethnic group leader (Mr. Cholash Recil) died due to clashes with law enforcing authority. So, before taking any initiatives from IPAC Side in this regards, this issues must be taken into consideration.

- **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 natural 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, medicinal plant gardening, medicinal plant nursery, poultry, bee culture, 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 forest resources uses.
- Habitat restoration and rehabilitation: Still there are denuded areas within the forest, created due to clear felling and these areas could be brought under plantations with indigenous and eco-friendly plant species.

Besides these, for better result excavation / re-excavation / improvement of degraded Lake, Beels and canals, stocking indigenous endangered species, fish sanctuary, proper plantation on embankment of the Bongshai River and its braches and Fish Act implementation within project area the habitat can be restored.

6. Recommendations and Suggestions

Administrative

- **6.1** Poor forest management by the Ministry of MoEF and Forest Department has been identified as one of the major reasons for forest degradation. Strengthening and capacity building of FD, along with local concern authorities' engaged in forest 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 FD 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 in forest management and community development required for the local FD and related GoB staffs;
 - Logistic support for the local concern offices like motor cycle, pickup, truck and other necessary equipments can be provided from project;
 - Developing and strengthening linkage among local club or federations and local government;
 - Enforcing Forest Acts and rules;
 - Provision for providing incentives to local staff to make the job lucrative
 - Steps for improving the moral 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 in consultation on scientific and technical point of view

Technical Management

- **6.2** An appropriate, site specific and technically sound management Action Plan should be developed in consultation with 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 forest resources and biodiversity
 - a long-term biodiversity monitoring plan aiming at changes in the biodiversity in the forest; not only targeting to measure the changes impacted due to project activities but also to identify post project situations.

Some specific suggestions:

- i. Clear felling should be stopped by any means to conserve the forest and biodiversity.
- **ii.** Plantation of exotic species should be carefully assessed with its after effect on other local variety of plants and animals. No long term strategies should be taken for plantation of the forest, rather principal of increasing wilderness by natural regeneration processes should be followed.
- **iii.** Short-rotational plantations with exotic trees should gradually be replaced with indigenous species for social forestry.
- iv. A number of monkey and languor groups are still inhabitant of Madhupur forest, Due to scarcity of adequate food and shelter, they are in vulnerable condition. In this regards, a rehabilitation scheme should separately be considered for resident monkey and languor groups of Madhupur forest. To this end he following activities can be considered:
 - re-establishment of habitat continuity between the fragmented habitats of these primates
 - plantation scheme with food trees suitable for non-human primates such as Bohera, Horitoki, Amloki, etc.
- v. Considering local dependence on the forest resources, sustainable use of some resources like vegetables, honey, medicinal plants and other non-timber forest products may be allowed.
- vi. Fuel-wood, bamboo and collection of some other major building materials should be stopped on a short term basis, but this may not be as success as long as there are scarcities 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. Therefore, project should strongly consider the following:
 - establishment of a buffer sustainable resource use zone around the NP with provision for fuel-wood plots, woodlots and other plantations required for house building purposes
 - providing resource substitution (for example, commercialization of fuel made of rice, husk and others)
 - promotion of fuel efficient stoves / oven in the locality
 - promotion of homestead plantation

Project activities targeted to local stakeholders.

6.3 Poor resource users, particularly those who are dependent on the forest for their livelihood, should be identified and brought under AIG programs with provision that

they give up the unsustainable use of forests / forest resources. The possible AIG opportunities include

- Nursery
- Bamboo and cane based handicrafts
- Handicrafts
- Poultry
- Medicinal plant gardening and nursery
- Ape culture
- Fish culture

6.5 There is a non government organization working in the project area called SEMP (Society for Protection of Medicinal Plant & Environment), Telki, Nokmandi, Jalchatra, Madhupur, Tangail. They produce medicinal plants in the selected plots and sell those to herbal medicine companies. The benefits distributed among the beneficiaries. They have 1500 beneficiaries with 300 house holds. IPAC can collaborate with this organization and expand its activities.

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

6.7 Awareness raising activities should be carried out on a priority basis in the area to make the people understand how they would get benefit from this project.

6.6 It is felt that the illegal resource users (illegal tree fellers in particular), get shelter from local authorities hence strong dialogue should be initiated among them involving the higher authority. A similar approach may be taken with local ethnic community based organization like as Joyenshahi Adivashi Unnoyan Parished, Ahsik Mishik Society, Indigenous People Development Services, etc. to ensure the effective involvement of them.

6.8 Excessive forest cases suited against the local people have led to increased incidences of illegal tree felling. These cases should be reviewed and withdrawn, it necessary, as a trade off for the people's future role in the project.

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

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

6.11 As an initial step, the project should concentrate its activity inside the forest villages and later with the other identified villagers having minor / negligible stakes.
6.12 The project should also initiate dialogue with the sawmill, brickfield, furniture shop owners of the locality and motivate them towards the importance of biodiversity conservation. Through motivation also let them be aware and understand about the benefits of project activities.

6.13 The project should also make provisions for generating a scientific and social knowledge base about the forest resources.

6.14 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.

6.15 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 forest / forest resources.

6.16 Wetland Resource inside Madhupur Shal Forest: There is a potential water area inside the forest. This is a man made water body. Present area is about 2 acres. The team was informed that this lake was renovated when FD was trying to establish Eco-Park. However, presently this water body is remaining as derelict. It has high potentiality for fish culture. It may be a good source of income for CMC, once it is formed. IPAC can take up these interventions as a prior activity. Besides, there are few more ponds inside the forest. These ponds may also can be brought under fish culture, there after would be a good income source for the beneficiaries.

<u>Annexure – 1</u> Pictorial Presentation



Dried leaves collection of a ethnic women

Tree felling from Dhokla Range



A kind of wild resource (banana root)





A natural lake within Madhupur Forest Forest



A pineapple garden within Madhupur



A pineapple of a garden of Madhupur Forest



A banana garden of Madhupur Forest



Action of transect walk of PRA / RRA team



A wild lizard at it's habitat



A wild monkey at Madhupur Forest



PRA team involve to stop forest fire



Dried leaves collection by a local women



A water collection hole of dry season



Local peoples making social map



Group discussion with community elite person at Bhutia, Auronkhola



A wild barking deer captured by FD guard



A pair of capped languor of Madhupur National Park



A of heard of deer and monkey at Lohoria Deer Breeding Center



Rubber Garden in Madhupur Forest Area



Effect of forest burning

Annexure-2

Checklist of questions of RRA for FGD, KI and HHs interview a. Checklist of questions for FGD

I. Stakeholder Assessment

- 1. What are the settlements/villages from where the people come to the forest and collect resources? Please indicate its location on the map.
- 2. What are the different categories of people who collect different resources from the forest?
- 3. At what extent the local people depend on the resources they collect from the forest 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 and management of the forest 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 forest in the recent past?
- 7. Which plants and animals in the forest 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 forest 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 forest? 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 the forest and forest 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 forest 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 forest?
- 2. What are the villages from where people come to forest 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 forest?
- 4. Who are the other people who don not use forest resources but have linkages with resource exploitation and development of the forest?
- 5. Are there any people who can be important for the conservation of the forest 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 Forest Department? If yes, what are those?

Resources and resource status

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

Resource exploitation and dependency on forest

- 15. What are the various resources that are collected from the forest? 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 forest?
- 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 forest?

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 upto school, colleges and above?
- 24. How have the occupations of people 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 forest and collect any thing?
- 35. Is there illegal tree felling? Is it at large scale? Does it affect forest health? Are the feller local or come from outside?
- 36. What are the main reasons for tree felling?
- 37. Do you think that the forest department people are protecting the forest resources?
- 38. Is there any issue of forestland encroachment? What are problem with recovery of these land?

Gender issues

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

Others:

- 42. What are the major threats to the forest habitat and its resources
- 43. 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 forest 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 forest is a park/wildlife sanctuary / reserve
- 3. Do you know what are allowed and not allowed to do in the park/reserve / sanctuary
- 4. Do you think that the forest resources should be preserved /conserved ?

Stakeholders

- 5. What are the villages from where people come to forest 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 forest?
- 7. Who are the people who do not use forest resources but are involved with the forest or has control over the forest
- 8. What are the organizations/institutions which carry out any type of work in the Forest

Resources and resource status

- 9. Which plants and animals have disappeared from the forest in the recent past?
- 10. Which plants and animals in the forest 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 forest?
- 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 forest, which ones won't be available in 5 or 10 years?
- 16. Do you use medicinal plants from the forest?

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 upto 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 forest and collect any thing?
- 35. Do you know that there is tree poaching in the forest? If yes, from where they come (villages)?
- 36. Do you think that the Forest Department people are protecting the forest 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 forest make up and dynamics

Transect map: Necessary for understanding the present forest physiographic and topography. A few transects across the forest will give an idea on overall make up of the forest. 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 forest. It will also provide the opportunity to learn many thing about the forest 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 forest 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 forest

Trend analysis in forest dynamics:

Changes with time of the following: forest cover and thickness, abundance of tall trees and herbs and shrubs, settlements, population

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

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

Understanding the land encroachment process: Important for IPAC Madhupur Site

- historical perspective and trend
- who and how
- uses and transformation
- legalization process

- causal factors
- impact on forest

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

PRA ISSUES

Fuel-wood collection/collector

Information to be collected:

- who collect (adult, boys or girls / women, poor or rich / employed labor, gang/armed gang, local / outsider if possible mention the settlements from where they come etc.)
- purpose of collection (for selling, HH consumption or both)
- what compels them to extract the resource
- do they depend on the extraction for their livelihood (partially / entirely, supplement income), at what extent and how
- What encourages them to take up the activity
- What are various uses of the resource
- if commercial-where do they sell, who buys, where does it go, who are the traders and where, prices at various levels
- Quantity collected/day/person
- any conflict with FD or other people over the extraction
- any negotiation or arrangement to carry out the activity
- any alternate source for the collection of the resources
- needs and expectation of the collector
- impact on the forest, as the participants see
- Risk for the collectors as the collector see, if the activity is carried out at this rate

Illegal timber felling

- Information to be collected:
- Who collect (adult, boys or, poor or rich/ employed labor, gang / armed gang, local/outsider etc. if possible mention the settlements from where they come etc.)
- at individual or group level
- Who are behind the activity and indicate the network
- Purpose of collection (for selling, HH consumption or both)
- reasons for the activity
- uses of the resource at various levels
- what compels them to fell the timber

- Do they depend on the activity for their livelihood (partially/entirely, supplement income or for added income), at what extent and how?
- What encourages them to take up the activity?
- Anybody protect them, if they are in problem
- If commercial-where do they sell, who buys, where does it go, where are the traders-indicate the chain
- how the protection is provided by FD or by any other agencies (e.g. Police etc.) and at what stage
- any conflict with FD or other people over illegal felling
- any negotiation or arrangement to carry out the activities
- needs and expectation of the feller
- as seen by the feller, impact on the forest due to the activity on forest and its resources
- Impact on/risk for the collector, if the activity is not allowed
- Seasonality and trend analysis

Collection of trees as building materials

Information to be collected:

- who collect (adult, boys or girls/ women, poor or rich/ employed labor,
- gang/armed gang, local/outsider if possible mention the settlements from
- where they come etc.)
- carried out at individually or in group
- purpose and reasons for collection (for selling, HH consumption or both)
- uses of the resource
- what compels them to extract the resource
- do they depend on the extraction for their livelihood (partially/entirely,
- supplement income), at what extent and how
- What encourages them to take up the activity
- if commercial-where do they sell, who buys, where does it go, who are the
- traders and where, prices at various levels
- any conflict with FD or other people over the extraction
- any negotiation or arrangement to carry out the activity
- any alternate source for the collection of the resources
- needs and expectation of the collector
- impact on the forest, as the participants see
- Risk for the collectors, as the collector see, if the activity is carried out at
- this rate

Bamboo and cane collection

- Information to be collected:
- Who collect (adult, boys, or girls / women, poor or reach / employed labor, gang / armed gang, local / outsider if possible mention the settlements from where they come etc.)
- Purpose of collection (for selling, HH consumption or both)
- what compels them to extract the resource
- Do they depend on the extraction for their livelihood (partially / entirely, supplement income), at what extent and how

- What encourages them to take up the activity
- What are various uses of the resource
- if commercial-where do they sell, who buys, where does it go, who are the traders and where, prices at various levels
- any conflict with FD or other people over the extraction
- any negotiation or arrangement to carry out the activities
- any alternate source for the collection of the resources
- Needs and expectation
- Impact on the forest, as the participants see
- Risk for the collector, if the activity is carried out at this rate

Information the Ethnic community:

- Distribution of ethnic community settlement in and around the forest
- Probable No. of HH in each settlement
- Present economic activities
- Resources (plants and other NTFPs) they extract and reason for extraction (consumption / selling or both)
- dependence on the forest resources and its impact on the forest
- land encroachment by them
- relationship with the local people or agencies
- internal governance system
- conflict with FD or other agencies or other people on there use of the forest
- needs and expectation
- reaction to the project

Information on Forest villagers:

- Distribution of forest villager's settlement in and around the forest
- No. registered and approx. present number of HH in each settlement
- Privileges under FD agreement
- compliances to agreement
- Present economic activities
- Resources (plants and other NTFPs) they extract and reason for extraction
- (consumption/selling or both)
- dependence on the forest resources and its impact on the forest
- settlementalization processes and land encroachment by the forest
- villagers or by their dependant
- relationship and conflict with FD
- Forest villager management / or internal governance system
- needs and expectation
- reaction to the project

FD's forest management regimes

- Forest patrol, check post operation etc.
- Activities of other organization in relation to the forest protection
- Any special management efforts for the NP /WS / Reserve etc.
- Forest cases and punishment
- Is the present regime effective in protecting the forest
- Prevailing unlawful extraction and uses
- If not effective, what are the causes for the poor management of the forest (lack of manpower and logistics/ accessibility and problem in movement / fear of bandits / local people more powerful / little help from the higher

authority / low morale of FD staff / intervention by the local public representative or political elite etc.)

FD's plantation strategies

- Area under plantation
- Species planted (information on clear felling etc.)
- Plantation practices
- Nursing and care (thinning etc.)
- Impact on the wilderness

Information on Brickfield/ Brickfield owners

- Nos. and distribution
- Owners and their influences
- Compliance to forest laws
- Period of operation
- Sources of fuel-wood (from the forest concern or from elsewhere)
- Type of fuel-wood used
- Network of supplies
- Approx. quantity used / year
- Impact on forest

Information on Sawmill / Sawmill owners

- Nos. and distribution
- Owners and their influences
- Compliance to forest laws
- Period of operation
- Who brings timber to them
- Sources of timber (form the forest concern or from elsewhere-homestead)
- How distinction is made between timber from the forest and that from villages
- Inspection by FD / or other law enforcing authority
- Network of supplies

Livestock grazing

- Identification of grazing areas
- Types and No. of livestock
- Who owns the livestock (ethnic/poor/rich/influential/general people)
- Mention whether seasonal and all time
- Description of damages / impact caused by grazing

• Alternate areas for grazing

Information on clear felling

- Area felled
- Name of auctioneers and their influences
- Natural or planted trees felled
- Felling practices (clearing, burning etc.)
- Operation period
- Transportation and marketing of felled trees-network
- Link with illegal feller
- Impact on the forest

Notes