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**Site-Level Field Appraisal for Integrated  
Protected Area Co-Management Project:**

**Fasiakhali Wildlife Sanctuary (FWS)**

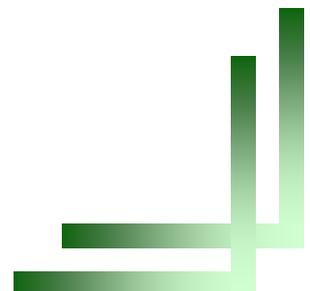
**April 2009**

**IPAC Project**

**Chakaria Site**

**South Eastern Cluster**

**Cox's Bazar**



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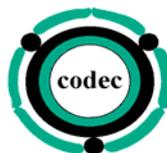
*Prepared for:*  
**International Resources Group (IRG)**



*Prepared by:*  
**Chakaria Site Team**

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Cox'sbazar

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**April 2009**



## **Table of Contents**

List of Tables .....	4
List of figures .....	5
Acronyms .....	6
Chapter 1: INTRODUCTION .....	7
1.1 Project Background.....	7
1.2 Project objectives .....	9
1.3 Rationale of the study .....	9
Chapter 2: SANCTUARY DESCRIPTION .....	11
Chapter 3: METHODOLOGY .....	14
3.1 RRA and PRA schedules and spots .....	14
3.2 Setting RRA and PRA Issues and Questions.....	16
3.3 Formation of RRA and PRA Field Teams.....	18
Chapter 4: FINDINGS .....	20
4.1 Forest land use change dynamics.....	20
4.2 Land encroachment dynamics.....	22
4.3 Stakeholder assessment.....	26
4.4. Socio-economic setting and dynamics.....	33
4.4.1 Demographic Profile.....	33
4.4.2 Livelihood analysis .....	35
4.5 Uses of forest and forest resources .....	36
4.5.1 Fuel wood collection from the Wildlife Sanctuary.....	37
4.5.2 Illegal tree felling:.....	42
4.5.3 Hunting and killing of wildlife: .....	43
4.6 Local community, power structure and governance .....	44
4.7 Local conflict, Conflict resolution, social adhesion and cohesion.....	48
4.8 Local problems and expectations.....	50
4.9 Forest management regime .....	53
4.10 Crosscutting issues.....	54
Chapter 5: ISSUES and CHALLENGES .....	56
Chapter 6: SUGGESTIONS and RECOMMENDATIONS.....	58
Annex I: PA Gazette .....	61

## **List of Tables**

	Pages	
Table 1.	Administrative units of FWS	
Table 2.	List of selected RRA spots and schedule for visits	
Table 3.	PRA spots and schedule for conducting field activities	
Table 4.	Selected RRA/PRA Issues for Fashiakhali wildlife sanctuary, specific activities and tools used.	
Table 5.	RRA and PRA Team for FWS	
Table 6.	Records of performed activities in different beats of FWS during PRA	
Table 7.	Trend analysis (Forest quality and resource use matrix).	
Table 8.	Identified settlements and their level of stakes with FWS	
Table 9.	Identified stakeholder (SH) groups in Fashiakhali Wildlife sanctuary (based on PRA findings)	
Table 10.	Settlement wise relative distribution of different stakeholders in FWS.	
Table 11.	Summery information on Resource Exploitation in FWS	
Table 12.	Seasonality chart on various matrices for FWS	
Table 13.	Cause and effect ranking (understanding underlying facts)	
Table 14.	<a href="#">Information on forest villagers and other settlers inside the FWS</a>	
Table 15.	List and location of sawmills/Brickfields around the FWS	
Table 16.	Trend analysis of socio-economic situation	
Table 17.	List of powerful and influential persons in FWS and surrounding areas.	
Table 18.	Timber Poaching Groups in FWS	
Table 19.	Information on NGOs active in FWS	
Table 20.	Sources of conflict and its resolution	
Table 21.	Ranking of local problems and enquiry into its solution	
Table 22.	Manpower involved in management of FWS.	

**List of figures**

	Page
Figure 1. Map of Fasiakhali Wildlife Sanctuary . . . . .	
Figure 2. Types and stages in land encroachment in the sanctuary . . . .	
Figure 3. Types and stages in land encroachment in FWS . . . . .	
Figure 4. Flow diagram on fuel wood collection and processing . . . . .	
Figure 5. Venn diagram of fuel wood consumption. . . . .	
Figure 6. Venn diagram of Bamboo & Cane consumption . . . . .	
Figure 7. Venn diagram: Sources of Conflict . . . . .	
Figure 8. Different steps followed in conflict resolution. . . . .	
Figure 9. Remnant Sundri in the Chakaria Sundarbans . . . . .	

## **Acronyms**

Acronym	Detailed name
AIGA	Alternative Income Generating Activities
ASA	Association for Social Advancement
BO	Beat Office/ Beat Officer
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
CBO	Community Based Organization
CMC	Co-Management Committee
CODEC	Community Development Centre
Dept.	Department
DFO	Divisional Forest Officer
FD	Forest Department
FGD	Focus Group Discussion
Fig.	Figure
GD	Group Discussion
Govt.	Government
HHs	Households
IGA	Income generating Activities
Int.	Interview
IRG	International Resource Group
IPAC	Integrated Protected Area Co-Management
kg	Kilogram
KI	Key Informant Interview
LGED	Local Government Engineering Department
MACH	Management of Aquatic Ecosystem through Community Husbandry
MP	Member of Parliament
NACOM	Nature Conservation Management
NGO	Non Government Organization
NSP	Nishorgo Support Project
NP	National Park
PA	Protected Area
PDB	Power Development Board
PRA	Participatory Rural Appraisal
RDRS	Rangpur Dinajpur Rural Service
RO	Range Office
RRA	Rapid Rural Appraisal
SH	Stakeholder
FWS	Fasiakhali Wildlife Sanctuary
MKNP	Medhakachapia National Park
Tk.	Taka
UP	Union Parishad
USAID	United States of Association for International Development
WFC	WorldFish Center
BASTOB	Bangladesh initiative for peoples help development
SARPV	Social Assistance and Rehabilitation for the Physically Vulnerable

## **Chapter 1: INTRODUCTION**

### **1.1 Project Background**

The Integrated Protected Area Co-management (IPAC) is an initiative of GOB and USAID to embark upon the *strategic goal* of scaling-up natural resource co-management at the policy and operational level by achieving recognition, acceptance and integration of this approach by the GOB into its management tactics.

IPAC will build upon and provided additional support to the successful co-management interventions launched under the Management of Aquatic Ecosystems through Community Husbandry (MACH) project and the Nishorgo Support Project (NSP). MACH served to demonstrate the feasibility of the community co-management model to open water and wetland resources. NSP has supported co-management of tropical forest resources and pilot sites of the Forest Dept protected area network. It has concentrated on preserving protected forest areas in Bangladesh, along with biodiversity conservation, by working with local resource users living around officially notified protected areas (national parks, wildlife sanctuaries and game reserves). Particular emphasis has been given to developing the capabilities of local resource management organizations to broker community consensus in understanding, accepting and assuming their roles and responsibilities under a co-management approach in collaboration with the Forest Department.

Under IPAC, carefully crafted, integrated, activities will be implemented over significantly larger areas to: develop a protected area strategy that applies to all ecologically and economically significant areas, including those outside of freshwater and forest ecosystems, build technical capacity within wildlife and local level institutions for protected area co-management, and expand the geographic area of Bangladesh under co-management to ensure the long-term success of the model. Institutionalization and successful implementation of IPAC will also address a series of short-, medium- and long-term climate change adaptation and mitigation issues.

The IPAC project includes three main components:

1. Development of a coherent strategy for integrated protected areas co-management and biodiversity conservation, through support for constituency building; visioning, policy analysis and strategy development; partnership building for sustainable financing; and development of an outreach and communication strategy with a focus on awareness raising.
2. Building stakeholder and institutional capacity, through support for training to GOB wildlife and local level staff, NGOs and rural communities; strengthening of existing training centers and development of new and innovative applied training courses; and development of local support services for integrated, participatory co-management.
3. Site specific implementation of co-management in Protected Areas to continue field testing and institutionalization of proven approaches for integrated PA co-management in existing and new aquatic and terrestrial protected areas; this will include the selection of additional sites to scale up the network of co-managed PA, and expanded support for alternative income generation activities, value chain strengthening, public-private partnerships, leveraged conservation financing and local level outreach to increase community interest in conservation and environmental stewardship, while contributing to improved welfare of rural communities through reduced vulnerability and increased adaptation to climate change, increased access to improved drinking water supplies and more secure and diversified livelihoods.

The program will also support cross-cutting approaches to take account of gender perspectives in natural resource management and to enhance gender mainstreaming processes, along with a focus on youth, to improve the livelihoods of young people and to provide a solid future constituency for conservation.

Project activities are designed to achieve the following purposes:

- Provide technical advisory services to GOB environment, forestry and fisheries departments to support the further development of the natural resources sector and the conservation of biological diversity;

- Develop a protected area strategy that applies to all ecologically and economically significant areas, including those outside of freshwater and forest ecosystems;
- Build technical capacity within wildlife and local level institutions for protected areas co management;
- Expand the geographic area of Bangladesh under co-management to ensure the long-term success of the co-management model and to extend socio-economic benefits to surrounding communities, including increased access to improved drinking water supplies and to opportunities for alternative income generation
- Address within IPAC a series of short-, medium-, and long-term climate change mitigation and adaptation issues.

Field interventions of IPAC lies in five Clusters including 26 targeted sites covering over 360,000 hectares and the surrounding landscapes with rural communities of 2.2 million people:

1. Sylhet (Tanguar Haor, Hail Haor, Hakaluki Haor, Lawachara, Rema-Kalenga, Satchari, Khadimnagar protected areas);
2. Chittagong Hill Tracts (Pablakhali, Kaptai protected areas)
3. Southeastern (Teknaf, Inani, Himchari, Medha Kachapia, Fasiakhali, Chunati protected areas)
4. Central (Madhupur and Bhawal Wildlife sanctuaries; Kangshaw-Malijhi and Turag-Bangshi wetlands)
5. Sundarbans (Wildlife Sanctuaries and ECA)

## **1.2 Project objectives**

The overall IPAC *objective* is to promote and institutionalize an integrated protected area co management system for sustainable natural resources management and biodiversity conservation that results in responsible, equitable economic growth and good environmental governance.

## **1.3 Rationale of the study**

Fasiakhali Wildlife sanctuary covers a pocket of remnant forest reserve of Fasiakhali Range with high biological diversity including the last resort of few herds of majestic Asian elephants. FD is currently in a hurdle to protect the valuable resources of the

sanctuary in a fencing and policing approach, whereby surrounding communities are excluded in management and use of its resources. However, local needs for forest resources like timber and fuel wood are inevitable and hence collaborating with the surrounding communities in conservation and sustainable use of resources is considered an empirically proved approach. With this view IPAC took this site as an area of intervention and the study under IPAC will generate an information base regarding existing status of the PA, identification of stakeholders and suitable strategy for the project. The study will provide further guidance in formation of local institutions like village conservation forum (VCF), peoples' forum (PF), collaborative management council (CMC), collaborative management committee (CMC), identification of suitable AIGAs, training needs for participating stakeholder communities and other cross-cutting issues to be undertaken for the project.

Alike any other interventions, PRA in IPAC is viewed to be mandatory to take account of potential threats, conflicts and interests and the actors behind those so that adequate and timely measures are taken well care of in IPAC capacity to ensure sustainable management of the sanctuary.

## **Chapter 2: SANCTUARY DESCRIPTION**

Fasiakhali Wildlife Sanctuary (FWS) at Chakaria is under Fasiakhali Range of Cox's Bazar North Forest Division. The sanctuary lies between 21<sup>0</sup>45' to 21<sup>0</sup>40' N and 92<sup>0</sup>4' to 92<sup>0</sup>8' E. Government has declared this area of biological importance to be a wildlife sanctuary in April 2007 under Bangladesh Wildlife (Preservation) (Amendment) Act/1974. It covers hilly reserved forest areas under Fasiakhali block and parts of Ringbhong and Dulahazara blocks covering an area of 1302 ha.

Once this forest was evergreen and semi-ever-green tropical forests of natural Garjan (*Dipterocarpus* spp.) and Dhakijam (*Syzygium* spp.) as dominant species along with Chapalish, Telsur, Chandul, Pitraj, Uri aam, Bandorhola, Toon, canes, bamboo, shrubs and climbers. Epiphytes with aroids, mosses and orchids were abundant there. With the passage of time natural forests degraded and following past and present management plans plantations were raised with various long rotation species namely teak and others. Presently the wildlife sanctuary is dominated by Garjan and Jam along with some teak plantations and short rotation participatory plantations of *Acacia* spp., *Eucalyptus* etc. Gradually the multi-storied and diversified species forests converted into selected planted species. Pressure from illicit timber traders and surrounding human settlements increasingly intensifying and the forest reserve is facing challenges from habitat loss for majestic Asian elephants, the flagship species of this sanctuary. Besides, this area is also reportedly abundant in faunal diversity of birds, snakes, deer and other wildlife.

Chittagong-Cox's Bazar highway and Chakaria-Lama inter-district road goes through this sanctuary and constantly facilitating unlawful trespass and rampant removal of the forest resources from FWS. Due to heavy market demand for timber, politicized law and order regime and degrading commitment of local administration and politicians this sanctuary is at resource stake, whereby local FD personnel are too few to ensure utmost policing and fencing types of forest management or align with the local elites in resource extraction. Growing human interventions like fuel wood collection, encroachments and settlements for migrants from offshore islands and causing further deterioration of this sanctuary.

Due to geo-administrative location, i.e. bordering resourceful Lama Forest division, sanctuary resources are sometimes remain unidentified of its origin and during PRA visit, fuel wood cutters from western boarder are found almost unattended.

The low height hills covered with Garjan and Jam along with their vigorous natural regeneration and wild Asian elephant herds has a high potentiality to develop it as a valuable eco-destination of this region. Trail hiking and watch towers can be developed within the sanctuary area and eco-lodges in adjacent private areas can facilitate tourists to enjoy the scenic beauty and tranquility of the nature. Further engagement of forest villagers and other poor settlers can be benefited out of eco-tourism, which would eventually assist in flourishing conservation enterprises in the vicinity of the FWS.

The sanctuary needs zone-based interventions whereby habitat restoration inside the PA and buffer zone development for sustainable use by the adjoining communities and overall protection of illegal resource extraction as *a priori*. Involvement of local stakeholders, in the frame of village conservation forum (VCF), peoples’ forum, collaborative management council and co-management committee (CMC) should be ensured to strengthen FD as well as to acquire political commitment and socio-economic improvement of local communities.

At Duner Deba, 500m southeast of Fasiakhali beat office there is an opportunity to develop an artificial lake with a nearby huge Ficus tree, suitable for building a tree house. This requires excavation of the lake site for perennial sweet water reservoir and attracts the wildlife and house the Ficus tree for watching Asian elephants in wild. The sanctuary area and adjoining landscape is drafted in figure 1 below.

Table 1. Administrative units of FWS

<b>Range</b>	<b>Beat</b>	<b>Block</b>
Fasiakhali Range (10129.60 acre)  R.F. = 8324.56 acre  P.F. = 1805.04 acre	Fasiakhali Beat	Fasiakhali Block
		Ringbhong Block
	Dulahazara Beat	Dulahazara Block
		Hargaza Block

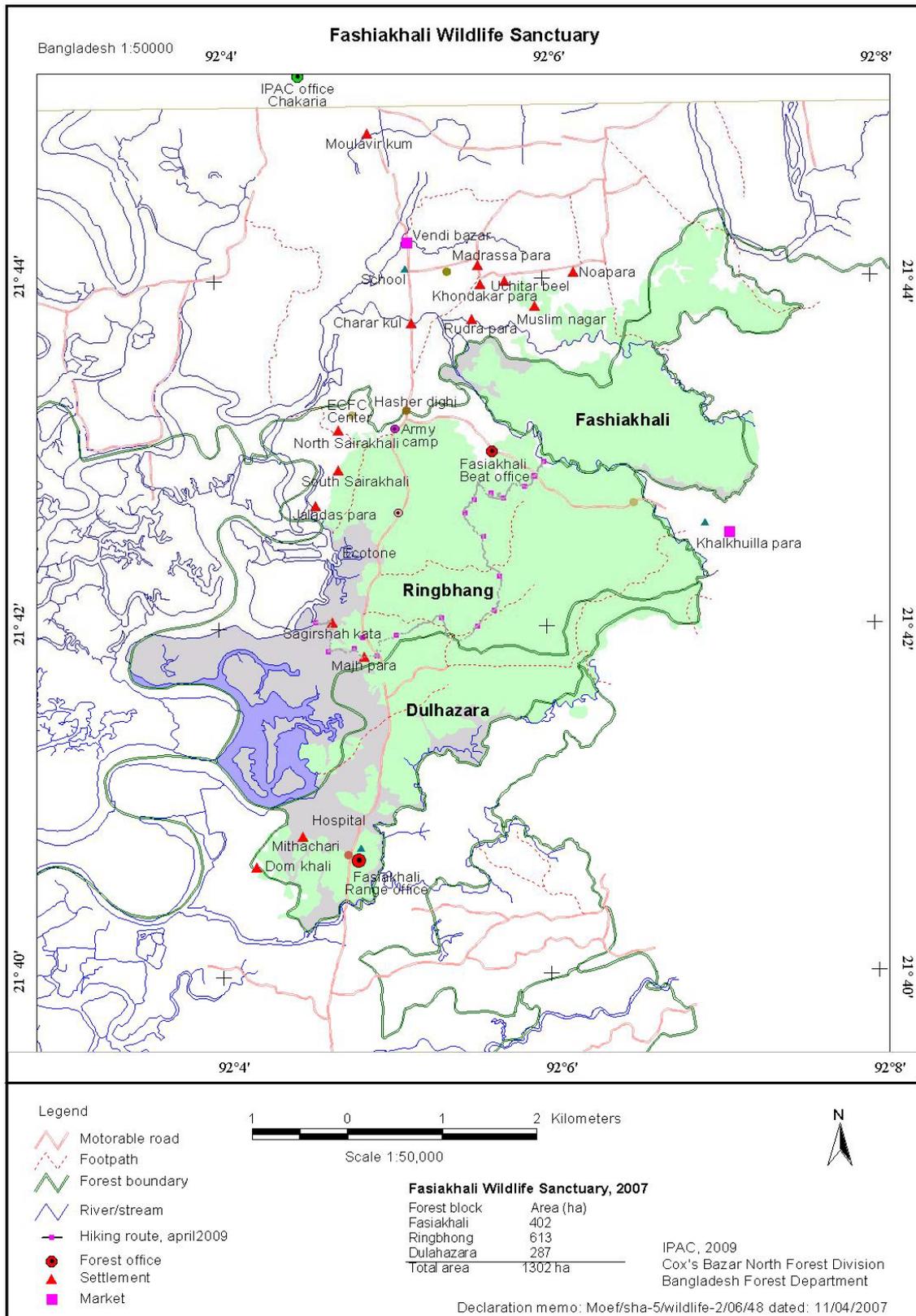


Figure 1. Map of Fasiakhali Wildlife Sanctuary

### **Chapter 3: METHODOLOGY**

During the appraisal process of Fasiakhali Wildlife Sanctuary (FWS) a two-step rapid appraisal strategy was taken. RRA was conducted as the first in the appraisal process, followed by PRA.

RRA was carried out as an initial activity in the field with a primary focus on generating information that would help to get a sense of the range of stakeholders, key issues and challenges that need to be addressed and provide information on the context (social, economic, ecological) 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 FWS with a view to understand: -

- Socio-economic and politico-administrative dynamics of forest resource degradation;
- Cause and effects of the behavior of local people and dependency over the FWS
- Opportunities for improvement in forest management.

#### **3.1 RRA and PRA schedules and spots**

RRA and PRA field exercises in Fasiakhali Wildlife Sanctuary were conducted during March and April 2009 and the detail time schedule for the field activities is given in Table 2 and Table 3.

Table 2. List of selected RRA spots and schedule for visits

<b>Date</b>	<b>Name of Spots/Villages</b>	<b>Activity</b>	<b>Remarks</b>
28.02.2009	UP Office	For secondary data collection	
01.03.2009	FD Range Office, Fashiakhali Beat	Acquaintance with FD personnel and planning for RRA in the Fashiakhali Sanctuary	
02.03.2009	FWS	Reconnaissance visit to the FWS	
03.03.2009	FWS	Reconnaissance visit to the settlements in and around FWS and adjoining area.	
04.03.2009	FWS	Finalize PRA schedule and identify PRA tools to be used	PRA Team formation

In consultation with the FD personnel IPAC team identified various spots for information collection. Further secondary data and discussion with the key informants and reconnaissance visits to the PA site PRA issues are selected as below.

Table 3. PRA spots and schedule for conducting field activities

Date	Village	Activities done	Remarks
04.03.2009	Ghonapara	FGD, KI, Resource Mapping & Trend analysis	Inside FWS; To identify the overall situation of forest resources in the FWS, especially in Ghonapara and pressures from surrounding settlements of forest villagers
05.03.2009	North Sairakhali	GD, Resource Mapping, KI, TA and FGD	Inside FWS; detailed discussions held with the forest villagers and other settlers regarding resource uses, trends and other specific issues.
07.03.2009	South Sairakhali	FGD, KI, Trend analysis and Resources Mapping	Inside FWS; To identify the stake of the settlement over FWS resources and status of existing resources in the FWS.
12.03.2009	Khondakar Para	GD, resource mapping, HH interview	Adjacent to the FWS:
14.03.2009	Rajar beel	GD, Resource mapping, Trend analysis, seasonality and HH interview.	Adjacent FWS; GD with Rajar beel communities regarding forest dynamics, trend, illegal timber felling and socio-economic aspects of the community
	Dumkhali	GD, KI, Trend Analysis	Inside FWS; detailed discussions held with the forest settlers regarding resource uses, trends and other specific issues.
25.03.2009	Charar kul	GD, Trend analysis, Resource mapping and HH interview	Adjacent to the FWS; To know the stake of Chararkul settlement and identify the use and trends of resource uses on adjoining forests and overall situation of forest destruction;
02.04.2009	Sagir Shah Kata	GD, FGD, Resource Mapping, Venn Diagram and HH interview	Adjacent/Inside/Outskirt to FWS. Discussion on various issues regarding Sagir Shah communities and FWS resource usages.
	Katakhali	GD, KI, Trend Analysis	Inside FWS; detailed discussions held with the forest settlers regarding resource uses, trends and other specific issues.
13.04.2009	Palakata	GD, Trend analysis, Resource mapping and HH interview	General discussion with the settlers in Palakata, adjacent to the FWS and conducted resource mapping.

<b>Date</b>	<b>Village</b>	<b>Activities done</b>	<b>Remarks</b>
19.04.2009	Forest transact	Transact walk and discussion with FD personnel and fuelwood cutters	Observe bio-physical features, tourist attractions, few walking trails, information sharing regarding the process of resource extraction from the wildlife sanctuary and dependence pattern of adjacent communities over the sanctuary.
	Hargaza	GD, Trend analysis, and HH interview	General discussion with the settlers in Hargaza, inside the FWS

### **3.2 Setting RRA and PRA Issues and Questions**

Alike Nishorgo Support Project and conducted RRA/PRA thereof, forest dominated sites in the Southeastern cluster have set for RRA/PRA issues and questions. With the guidance and demonstration PRA from IPAC central expert, Mr. Utpal Dutta on 28 February 2009 and previous reports of NSP sites developed by Nature Conservation Management (NACOM), IPAC team found their initial orientation and eventually framed a generalized format for the study. During progress of the PRA further improved were made to incorporate site-specific issues and included in the appraisal. However, RRA/PRA issues and questions set by the Chakaria Site team members including performance monitoring and applied research associate of SE cluster as follows:

Table 4. Selected RRA/PRA Issues for Fashiakhali Wildlife Sanctuary, specific activities and tools used.

<b>SI</b>	<b>RRA/PRA issues</b>	<b>Specific activities</b>	<b>Tools used</b>	<b>Participants</b>
1	Stakeholder (SH) Assessment	Identification of local settlers, resource users, institutions, agencies, community organizations and their relation with the FWS	GD, KI, Resource mapping and HH interview	Local people, forest villagers, settlers, local elites and civil society members
2	Resource status	Identification of trend and causes of forest degradation and loss of wildlife	GD, FGD, KI and HH interview	Local people, KI, local elderly members, FD personnel
3	Forest make up dynamics	Identify forest landscape including species diversity, distribution, landuse/ land cover, regeneration and distribution of wildlife;	Forest transact walk, resource mapping, GD, FGD, Trend analysis and KI	Local people/settlers, FD personnel and forest villagers
4	SH Demographic	Identification of settlements inside and adjacent to FWS,	GD, FGD, KI, Trend analysis,	Community people, forest

SI	RRA/PRA issues	Specific activities	Tools used	Participants
	profile	population/HHs, education, forest use, occupation and land holding	HH interview, Secondary information	user groups, settlers, FD and local union parishad
5	Economic activities/ livelihood strategies and human capital development	Identification of current occupation, skill, education, seasonal calendar of employment and credit facilities	GD, FGD, KI, HH interview, village transacts, Seasonal calendar	Local people, forest settlers, FD staff, fuel wood collectors, illegal timber fellers, local government representatives, NGO workers
6	Fuelwood and dry leaves collection	Identify Information of collectors, distribution, purposes & driving forces, extent & seasonality of collection, marketing channel, conflict & negotiation with FD and its impact of forests	GD, FGD, seasonal calendar	Community people, fuelwood and dry leaves collectors, FD personnel
7	Illegal timber poaching	Identify driving forces for illegal timber felling, key players and network of poachers, role of local elites, conflicts & negotiation process with FD, trend of illegal timber felling	GD, FGD, KI	Community people, illicit timber feller and FD personnel
8	Land encroachment	Identify historical perspective and trend of forestland encroachment, reasons and extent of encroachment, legalization process, conflicts and negotiation process.	GD, FGD, KI, trend analysis and secondary info	Local settlers, encroachers, forest villagers and FD personnel
9	Forest villagers	Identify distribution of forest villagers, registered and actual number of FVs, compliance to FD agreement, resource exploitation and dependence on forest resources, involvement in land encroachment process, relationship and conflicts with FD	GD, FGD, KI, trend analysis, secondary info	Forest villagers, FD personnel, local community members and villager registrar in FD office
10	Gender issues	Identify status of women in various aspects of family, social and professional life including education, health, IGAs, mobility and decision-	GD, FGD, KI, Mobility and seasonal calendaring	Female groups of housewives, fuel wood collectors, local female leader

SI	RRA/PRA issues	Specific activities	Tools used	Participants
		making process		and community people.
11	Perception of local people towards PA	Identification of local peoples' response towards FWS and its resources; issues of conflicts regarding encroachments and biodiversity conservation	GD, KI, HH Interview	Local community, FD staff
12	Local level awareness	Identifying local level awareness about resource degradation and conservation; perception of local people for biodiversity conservation and sustainable resource uses. Awareness of local communities regarding forest act and wildlife act	GD, FGD, KI, HH interview	Community people and leaders, different forest user groups, FD personnel
13	Legal aspects	Identify rights of local people in access to forests, forest conflicts (like land encroachment, illicit felling, hunting, shooting, poaching etc) and their negotiation process, law enforcement mechanism in the FWS.	GD, FGD, KI	FD personnel, encroacher, fuelwood collector and local community
14	Power structure	Identify local influential people and their role in forest conservation, encroachment, conflict resolution and maintaining social cohesion.	KI, GD, FGD	Local community, influential people, FD personnel
17	Others	Identify NGO activities in the locality, challenges for conservation with recommendations	GD, FGD, KI and HH interviews	Local people, community leaders, NGO personnel and FD personnel

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

The RRA/PRA team of Chakaria site includes site coordinator, site facilitators, site accountant and PMA research associate as the key players. Further local level FD personnel and settlement wise facilitators were incorporated in the team as and when necessary. RRA/PRA activities e.g. visit to the PA, settlements; institutions etc and interviews are conducted simultaneously by the following members of the team.

Table 5. RRA and PRA Team for FWS

<b>Sl</b>	<b>Name</b>	<b>Designation</b>	<b>Responsibilities</b>
1	Md. Muzammel Hoque	Site Coordinator	Team Leader
2	Baran Barua	Site Facilitator	Facilitator
3	Md. Kamruzzaman	Site Facilitator	Rapportaur
4	Md. Helal Uddin	Accountant	Logistic Support
5	Ruhul Mohaiman Chowdhury	PMA Research Associate	Technical support

During PRA exercise several tools viz. group discussion, village transact, resource mapping, key informant interview, focus group discussion, HHs interview, visit to institutions and forest transact are conducted. Field implementation strategies of various PRA tools applied are as below:

Table 6. Records of performed activities in different beats of FWS during PRA

<b>Forest Beat</b>	<b>Village/ Settlement covered</b>	<b>FGD</b>	<b>GD</b>	<b>KI</b>	<b>HHs Interview</b>	<b>Transect</b>	<b>Trend Analysis</b>	<b>Resource and social mapping</b>
Fashiakhali	07	03	06	03	100	01	06	05
Dulahazara	04	01	03	02	40	01	04	01
<b>Total</b>	<b>11</b>	<b>04</b>	<b>09</b>	<b>05</b>	<b>140</b>	<b>02 (PA)</b>	<b>10</b>	<b>06</b>

## **Chapter 4: FINDINGS**

### **4.1 Forest land use change dynamics**

Fasiakkhali Wildlife Sanctuary is bestowed with 1302 ha reserved forests of undulating low hills and few long rotation forest species with Garjan, Dhakijam and Teak as dominant ones. The tract is a last resort for wildlife including Asian elephants. Once primary natural forests disappeared decades back and plantations of few selected species took the place. FD management has introduced short rotation exotics like Acacia, Eucalyptus species in far degraded lands.

The top canopy is largely open and plantations in LR patches reached a height of average 20-25 meter and the lower canopy is dominated by herbs, shrubs and bushes. Trend analysis during PRA revealed that forest cover has been altered significantly in terms of tree density, diameter distribution and absence of tall trees. During previous management plan regimes (before 1971) human interventions are noticed as growing threats for the sanctuary area and during the last decade of nineteenth century, rampant exploitation of forest resources did exceed the prescriptions. Further, Govt decision for felling ban, neither consider market demands for forest produces nor achieve support from local elites, business communities and politicians. Influx of migrants from off-shore islands and coastal frontiers added the pressure of encroachment and resource extraction illegally. Consequently the tract gradually shaped a grim and unhealthy look and unable to provide ecosystem services. Recently human-elephant conflicts is being intensifying due to significant loss of elephant foods and habitats.

The undergrowth of the forests also are not escaped from excessive extraction since a number of growing settlements are largely dependent on this for fuel wood for HH consumption as well as cash earning from fuel wood selling at nearby markets. The northern and western side of the sanctuary outside highway is most heavily disturbed due to excessive human intervention. Settlements like Uchitar beel, Khondaker para, Noa para, Muslim Nagar and adjoining villages in the north and Haser Dighi, Sairakhali (North and South), Jaladas para, Sagirshah kata, Mitha chari and Dom khali in the south are entirely dependent on this forests for their homestead fuelwood needs and to some extent cash income from selling fuelwood as well. Some of the vital issues causing forest cover change are depicted as below, as identified during trend analysis of the PRA study.

Table 7. Trend analysis (Forest quality and resource use matrix).

Issues	Pre-1971	In 1990	Present (2009)	Major cause of changes
Forest cover	6	8	4	During 1950-70 GoB auction continued; during post liberation period new plantations came up; After 1995 excessive exploitation/ tree felling/ tree poaching/ expansion of settlement and agricultural activities, land encroachment and conversion took place with the involvement of local political and administrative elites.
Forest thickness	7	6	4	Tree thickness is gradually decreasing due to illegal felling and encroachments
Tall trees	8	6	4	After 1995 rampant removal of tall trees took place illegally.
Herbs/ Shrubs/ undergrowth	8	6	5	Excessive collection of fuelwood and poles for surrounding settlement consumption; cleaning before plantation raising.
Wildlife	10	7	4	Habitat destruction, shortage of shelter and fodder, hunting before 1990 by ethnic people.
Hunting	8	5	2	Less availability of wildlife and enforcement of wildlife act; Even today illegal hunting is found in FWS.
Illegal tree felling	3	4	6	Due to poverty in surrounding settlements, involvement of forest villagers in illicit felling and pressure from politicians and local elites
Fuelwood collection	2	4	6	Poverty, HH consumption, selling to market for additional income.
Encroachment	1	3	7	People from surrounding offshore islands and coastal belt settled after cyclones of 1963 and 1991; Settlers are increasing gradually with the help of politicians and forest villagers.
Bamboo and cane collection	2	5	4	Recent (2008) flowering caused complete destruction of bamboo grooves. In Paglir beel area, landscape of FWS, some natural bamboo grooves are available.
Fruit bearing trees in the sanctuary	7	5	3	Cleaning for new plantations; less plantation programme with fruit tree species; Less diversity of species and rarely found
Tobacco cultivation	0	0	3	Due to high profitability over Robi crops, less support of agri-loans and more supports from tobacco companies, farmers are encouraged for tobacco plantation in agri-fields.
Agricultural activities	1	2	4	Due to increased population, more people need to feed and agro-crops are farming along the valleys and <i>Ghona</i> (plain lands

				inside the hills).
Jhum/Shifting cultivation	5	3	1	Shortage of space for shifting cultivation, new plantation raised in Jhum area; FD do not permit Jhum cultivation.
Medicinal plant	8	5	3	Clear felling and subsequent burning the forest areas for new plantation; Due to forest destruction; availability of allopathic medicine; Reduced number of traditional healers and few people can identify medicinal plants.
Damage by elephants	0	3	5	Habitat destruction and shortage of fodder species caused human-elephant conflict more frequent.

## **4.2 Land encroachment dynamics**

Forest villagers are settled in 1950s to assist FD in plantation raising and forest protection issues. FD provided them 2 acres agri-fields and 1 acre of land for homestead each. They used to perform all the activities of forest management as helping hands of local forestry personnel. Over the time, they used to play significant role in forest management with the advantage that they remain in the same area for generations while the forestry personnel are frequently transferred. Gradually, the FD personnel became dependent on forest villagers and their heirs to identify routes of illegal poachers and even for forest administrative boundary.

PRA findings reveal that settlements of forest villagers include 4-5 times more households than that of registered villagers. In addition to their next generation, relatives from far away have accumulated in those villages and resulted in severe encroachment and clearing of forestlands. More and more settlers in and around the sanctuary cause added pressure to it and hence it seemed a priority to delineate the PAs and restrict the settlements into some pocket areas along with rehabilitate the scattered HHs into some identified settlements. Strong monitoring and restriction of further influx with law enforcement would be the timely action to save this hotspot.

### **Land encroachment and transformation**

In Fasiakhali Wildlife Sanctuary land encroachment is a critical & challenging issue, though land is the most valuable asset of the sanctuary. From the FGD with FD, it was reflected that 1/4 of total land of the sanctuary has been encroached.

Land is encroached by several groups of people, such as cyclone and flood victim. Rich, influential person, both the local and outsider and some family from Myanmar called Rohingya. But Most of the land is encroached by the cyclone and flood victim people. However, the forest villagers are also encroaching land more than their allotted rehabilitation area.

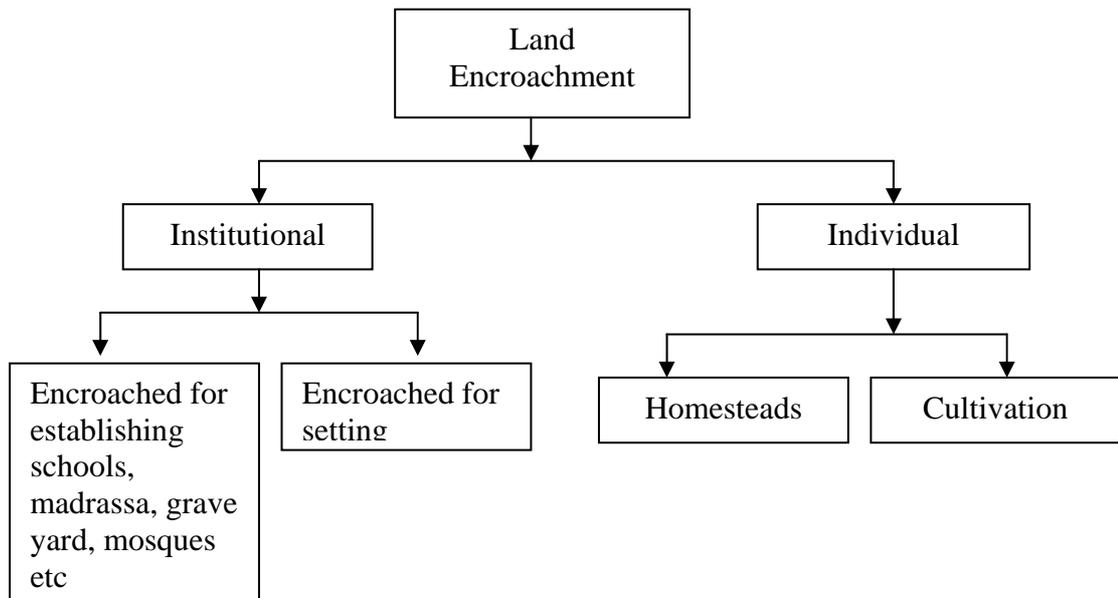


Figure 2. Types and stages in land encroachment in the sanctuary

**Underlying cause of land encroachment:**

In past the number of population was limited in the western side of the Arakan road. There was huge amount of land for resident, due to severe cyclone and flood in 1963 and 1991; the western sides of Arakan road become covered with settlements.

**The historical perspective of land encroachment:** Land encroachment started at Pakistan period, but become severe from 20 years ago.

**Land graving by forest villagers:**

Land encroachment started just after giving appointment of forest villagers. The forest villagers have encroached more land then their allotment. They have encroached land as they could to extend their land, for example Govt. allotted 2 acres of land to a villager, then he has increased his land by encroaching surrounding area by clearing the forest and leveling the low hill for own and their keen. After that, the relatives of some forest villagers have migrated and take shelter to those villagers house. After few days the

villager make a negotiation with the FD, then his relative allowed o establish new homestead adjacent to his relatives land.

Though land encroachment is going on from Pakistan period, but large-scale encroachment and establishment of permanent settlement begin the recent years. Headman: In some cases, the outsider people establish a relation with the headman. Providing handsome money to him and got permission to build a house.

The local blame that the forest villagers have grasped the hills and destructed the forest.

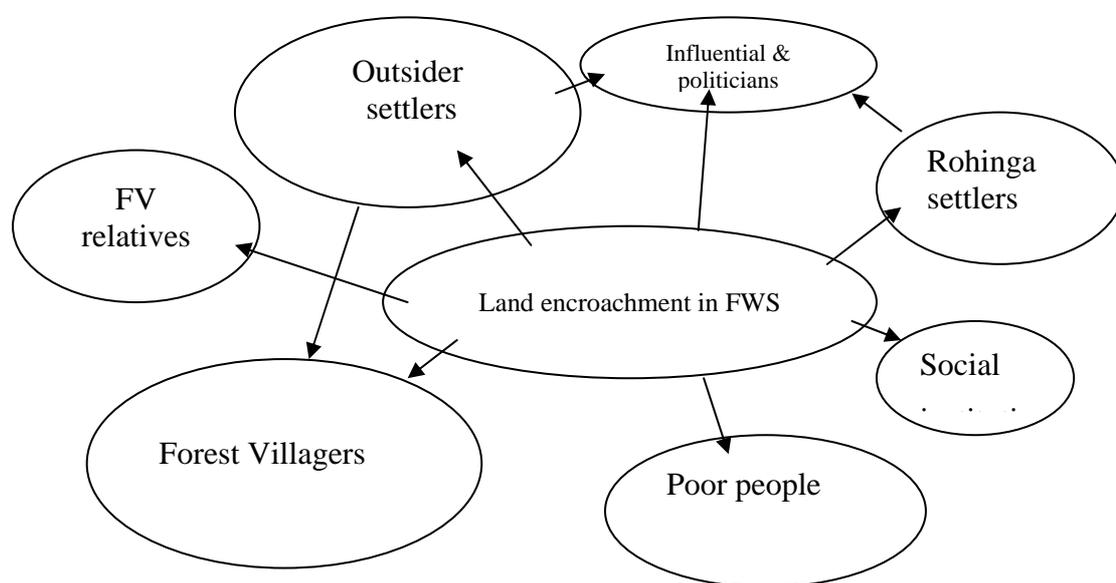


Figure 3. Types and stages in land encroachment in FWS

**Land encroached by the cyclone & flood victim and rich influential:**

The cyclone & flood victim and rich influential person also encroached land. It was revealed from FGD that one third of total land of sanctuary has been encroached yet. Land encroachment is in increasing day by day. Most of the influential persons, Rohingas, forest villagers and local poor people are encroaching land

The underlying causes behind is during the cyclone of 63s, 70s and 91s huge number of people made settlement here. The main reasons behind this are natural disaster such as flood, cyclone, for increasing own homestead and cultivable land by labeling the hills, for being constructed roads and improved communication facilities and local market etc. After that Rohingas had also came here and established settlements. Beside these the local

people have also graved land to increase their cultivable land. Local people also helped some outsider to establish their settlements.

Now forest villagers become an issue for the forest conservation. In many cases they are no cooperative with FD. But FD could not take any action against them. They have encroached huge amount of than more than their allotment from FD. In many case they gave shelter and land for establishing homestead to their relatives. And also some times they misguide the FD during the patrolling inside the forest for having negotiation with illegal feller. Maximum are migrated here by making any negotiation with the forest villagers and FD or being relatives of forest villagers.

The individuals behind this activity are powerful- more powerful than the FD with connections to people in politics and government, making the likelihood of a successful forest case against them low.

### **Encroachment around Forest Villages**

Forest villages were set up the mid 1950s, by the Forest Department who leased small areas of land (2 acres) to a certain number of households with in the reserve forest area. In return, the villagers are expected to help the Forest Department on the plantations and undertake other duties such as regular patrolling. The PRA research has indicated that these villages are playing an important role in the destruction and potentially the protection of the forests.

Under the forest village agreement, families have only a limited land area per household. So, as the population increases, their demand for land increases.

Table 8. Identified settlements and their level of stakes with FWS

SI	Village	Union	Total HHs	Location of village	Level of stake
1.	Hasher Dighi	Fasiakhali	80	Adjacent	Major
2.	Ghonar Para	Fasiakhali	110	Inside	Major
3.	Shikder Para	Fasiakhali	200	Adjacent	Minor
4.	Charar Kul	Fasiakhali	150	Adjacent	Major
5.	Khandakar Para	Fasiakhali	300	Adjacent	Major
6.	Rajar Beel	Fasiakhali	100	Adjacent	Major
7.	Naya Para	Fasiakhali	200	Adjacent	Major
8.	North Saira Khali	Fasiakhali	400	Inside	Major
9.	South Saira Khali	Fasiakhali	250	Inside	Major
10.	Palakata	Chirnigha +Pourashova	450	Adjacent	Major
11.	Vendi Bazar	Fasiakhali	200	Adjacent	Major

Sl	Village	Union	Total HHs	Location of village	Level of stake
12.	Moulavir Kum	Pourashova	300	Adjacent	Major
13.	Chira Pahar	Fasiakhali	30	Inside	Major
14.	Naya Masjid	Dulhazara	25	Inside	Major
15.	Dargah Gate	Dulhazara	200	Inside	Major
16.	Painna Jhiri	Fasiakhali (Lama)	150	Adjacent	Major
17.	Ranga Jhiri	Fasiakhali (Lama)	130	Adjacent	Major
18.	Charan Dweep	Chiringa	450	Adjacent	Major
19.	Muslim Nagar	Fasiakhali	60	Adjacent	Major
20.	Dhelpara	Fasiakhali	250	Adjacent	Minor
21.	Sagirshah Kata	Dulhazra	1300	Inside	Major
22.	Katakhal	Dulhazra	500	Inside	Major
23.	Ulu bunia	Dulhazra	450	Inside	Major
24.	Mitha chari	Dulhazra	150	Inside	Minor
25.	Doom khali	Dulhazra	500	Inside	Major
26.	Balur char	Dulhazra	600	Inside	Minor
27.	Boiragir kheel	Dulhazra	450	Inside	Minor
28.	Rong mohol	Dulhazra	300	Inside	Minor
29.	Hargaza	Fasiakhali (Lama)	100	Inside	Major
30.	Maiz para	Dulhazra	200	Inside	Minor
31.	Haidernashi	Fasiakhali	1100	Adjacent	Major

### 4.3 Stakeholder assessment

Stakeholder analysis identifies people from a varied interest groups involved in conservation, utilization, exploitation and watchdogs of natural forest resources. This analysis, in case of PRA in the FWS provides tools to identify and resolve trade-offs and conflicts of interests concerning the sanctuary and its resource use. At the onset of IPAC intervention such an analysis is viewed to be mandatory to take account of potential threats, conflicts and interests and the actors behind so that adequate and timely measures are taken well care of in IPAC capacity to ensure sustainable management of the sanctuary.

Through general discussions with the key interviewers, FD personalities, forest villagers, resource users and senior citizens in surrounding settlements, focus group discussions and stakeholder rankings are conducted.

As the legal custodian of the FWS, Forest Department, especially its field wings namely concerned forest division (*Cox's Bazar North*), range (*Fasiakhali*) and beats (*Fasiakhali* and *Dulahazara*) and the personnel thereof are identified as lead players. The project (IPAC) adequately appreciates the department as primary stakeholders engaged in control and management of forest resources of FWS.

Local politicians play pivotal role in resource management since they largely influence the power structure (political and administrative) at micro level. But the grim scenario is that local political influential often remained uninformed during the process of identification and declaration of a biological hotspot as protected area, which eventually remains least appreciated by them. Politicians are primarily dependent on peoples' mandate and they care for people's well being for the sake of winning the subsequent elections. As a tool in this effort, during election they facilitate the poor landless voters to encroach into the reserved forests and even into the PAs. It gains peoples' confidence over him as well as increase number of voters in his favour. After the election, winning politicians gain legitimate rights to influence the local administration to give further legitimacy to new settlers and build infrastructures to improve their livelihood in new oasis. Such backstopping of political leaders mainly aims to sustain people's consent. FD personnel, in this process, either often fails to prevent inoculation of growing settlers to the reserve or align with the political backings. In both the cases, these are largely done by the cost of massive destruction to the forest reserves.

Table 9. Identified stakeholder (SH) groups in Fashiakhali Wildlife sanctuary (based on PRA findings)

<b>Sl. No.</b>	<b>Stakeholder (SH) type</b>	<b>SH description</b>	<b>Role/Description of activities of SH</b>	<b>Impact on forest resources</b>	<b>Level of stake</b>	<b>Risks</b>
1	<b>Forest Department</b> Primary SH	Legal custodian of the FWS	sanctuary Management, administration, forest patrol	Management and control of resources	Major	Low
2	<b>Forest Villagers</b> Primary SH	Forest villagers settled by FD; Over time HHs size and number have increased significantly	Due to increased population, encroachment and conversion of lands occur; facilitate illegal tree felling and assist migrants to settle in the FWS	Increased pressure on forests and reduced biodiversity	Major	High
3	<b>Illegal Tree Feller</b> Primary SH	Local poors backed by the local businessmen, influential persons, politicians	Removal of mature trees illegally	Loss of mother trees, loss of biodiversity, habitat and reduced stock.	Major	High

Sl. No.	Stakeholder (SH) type	SH description	Role/Description of activities of SH	Impact on forest resources	Level of stake	Risks
4	<b>Land encroacher</b> Primary SH	Poor settlers from coastal areas and other parts of the country; backed by local influential and forest villagers	Settle and built houses in the FWS with assistance from local elites, forest villagers and forest staffs	Habitat destruction, shrinkage of forest land, loss of biodiversity; landuse change	Major	High
5	<b>Saw Mill owners and Timber Merchants</b> Primary SH	Local businessmen having strong network with local power structure and FD	Purchase timber from illegal fellers; Back up and influence the poor labours to engage in illicit felling	Loss of valuable forest trees and plus trees	Major	High
6	<b>Fuel wood collector</b> Primary SH	Local poor settlers, forest villagers, children, women and unemployed adults	Remove trees, saplings, dry branches as fuel wood	Loss of biodiversity and natural regeneration	Major	High
7	<b>Fuel wood merchants</b>	Purchase from poor fuelwood collectors and sale from temporary landing places	Control fuel wood market and influence fuel wood collectors to gather fuel wood illegally from forests	Loss of forest cover and biodiversity	Moderate	High
8	<b>Salt/Shrimp cultivators</b> Primary SH	Labours and owners of salt farms FWS surrounding flood plains	Local people engaged in salt farming during winter and shrimp farming during monsoon	Use Garjan sapling in salt cultivation	Major	High
9	<b>Rohinga settlers</b> Primary SH	Migrants from Myanmar settle down in the hilly	Due to unemployment, illiteracy and big family size, they are being target	Encroachment, reduce forest area, over exploitation of forest	Major	High

Sl. No.	Stakeholder (SH) type	SH description	Role/Description of activities of SH	Impact on forest resources	Level of stake	Risks
		forest areas	of local influential and get shelter in the hills; entire livelihood is dependent on forest resources	resources and reduce biodiversity		
10	<b>Dry leaf collector</b> Secondary SH	Mostly poor women and children	Sweep away dry leaves from forest floor during winter	Reduce forest fire but loss of humus	Minor	Low
11	<b>NTFP collector</b> Secondary SH	Local people	Few local people collect bamboo, cane, and medicinal plants.	Loss of biodiversity and NTFPs	Moderate	Moderate
	<b>Tobacco cultivator</b> Primary SH	Cultivate Tobacco in agricultural fields	Cultivate tobacco due to high profitability and get more supports from tobacco companies.	Decreased area of agri-crops; consume large amount of timber for curing (processing) tobacco leaves and other environmental and human health hazards	Major	High
11	<b>Local NGOs</b> Secondary SH	Involve in socio-economic development of local communities	Play vital role in community mobilizing, micro- finance, health, education, awareness and disaster management	Play positive role in forest conservation, provide livelihood supports to the communities	Major	Low
12	<b>Political/ local elites</b> Primary SH	Political, Local Government, Businessmen and leaders in the communities	Influence in forest land encroachment, involve in illegal tree felling, provide political and legal back up to poachers	Forest destruction, encroachment and biodiversity loss	Major	High
13	<b>Bangladesh Rifles</b> Secondary SH	42 battalion Army camp within the FWS	Maintain Law and order situation	Due to their presence, surrounding forests are	Low	Low

Sl. No.	Stakeholder (SH) type	SH description	Role/Description of activities of SH	Impact on forest resources	Level of stake	Risks
		boundary		least disturbed		
14	<b>Tea stall and restaurant owners</b> Secondary SH	A number of tea stalls and restaurants at Malumghat, Dulahazara and Chakaria	Depend on fuel wood from FWS	Forest destruction and biodiversity loss	High	High

PRA study reveals that illegal poaching of timber species, fuel wood collection and encroachment are major threats in the Fasiakhali wildlife sanctuary. In this process, forest villagers are playing a dominant role. The following table exhibits settlement wise relative distribution of different stakeholders in FWS.

Table 10. Settlement wise relative distribution of different stakeholders in FWS.

Village / settlements	Location	Resource extraction				
		Fuel wood/dry leaves	Illegal timber felling	Collection of NTFPs	Collection of sapling	Land encroachment
Hasher Dighi	Adjacent	0000	000	00	000	00000
Ghonar Para	Inside	00000	000	000	00	00000
Shikder Para	Adjacent	0000	00	000	0	00
Charar Kul	Adjacent	000	00	00	0	0
Khandakar Para	Adjacent	0000	0000	000	000	000
Rajar Beel	Adjacent	000	0	00	00	0
Naya Para	Adjacent	00	000	00	00	0
Saira Khali	Inside	00000	0000	000	000	00000
Palakata	Adjacent	000	00000	000	000	00
Vendi Vaja	Outside	00	00	00	0	0
Moulavir Kum	Outside	00	0	00	0	-
Chira Pahar	Inside	0000	000	000	00	00000
Naya Mosjid	Inside	0000	000	000	000	00000
Dargah Gate	Inside	0000	000	000	00	00000
Painna Jhiri	Outside	000	00	00	00	000
Ranga Jhiri	Outside	00	0	0	00	000
Charan Dweep	Adjacent	000	0	00	0	00
Muslim Nagar	Adjacent	00	00	00	00	00
Dhelpara	Adjacent	0	0	00	0	0
Sagirshah Kata	Inside	0000	0000	0000	000	0000
Katakali	Inside	000	00	00	0	00
Ulu bunia	Inside	0000	0000	00	00	00
Mitha chari	Inside	00	0	00	0	0
Doom khali	Inside	0000	0000	0000	00	000

Village / settlements	Location	Resource extraction				
		Fuel wood/dry leaves	Illegal timber felling	Collection of NTFPs	Collection of sapling	Land encroachment
Balur char	Inside	0	00	00	0	0
Boiragir khal	Inside	000	000	00	0	00
Rong mohol	Inside	00	00	00	00	00
Hargaza	Inside	0000	0000	0	00	000
Maiz para	Inside	00	000	00	0	00

Fasiakhali reserve has lost its earlier state of high forests in several decades ago as plantation of long rotation high-quality timber species started. Further, due to pressure from nearby populace for fuel wood and other non-wood forest products is growing more and more alarming. Some of these resource use regime, as learnt from the PRA is summarized as below:

Table 11. Summery information on Resource Exploitation in FWS

Sl	Name of exploitable forest resources	Reasons for exploitation	Users	Extent	Dependen cy	Risk
	Mature Trees	For timber	Local and distant people for commercial and domestic uses	Moder ate	High	High
	Fuel wood	For HHs consumption and commercial uses	Local people, tea stalls and hotel owners	High	High	High
	Dry leaves	As biomass fuel for HHs consumptions	Local women and children	Less	Moderate	Low
	Bamboo	HH use as fencing materials; in 2008 flowering destroyed natural bamboo grooves significantly	Locals and outside people	Less	Moderate	Mod erate
	Medicinal plants	As medicine and commercial use	Traditional healers	Less	Low	Low

SI	Name of exploitable forest resources	Reasons for exploitation	Users	Extent	Dependence	Risk
	Herbs/shrubs	Fencing, fuel wood, materials for HHs consumption	Local people and small businessmen	Moderate	Moderate	High
	Fruits	For domestic consumption	Local people, birds, monkey	Less	Low	Low
	Grass	As fodder for livestock	Local people	Less	Moderate	Low
	Cane	HHs uses for handicrafts	Local people	Less	Low	Low
	Creek/water body/ canal	Irrigation in the agri-fields; HH consumptions	Local farmers and HHs	Moderate	Moderate	Low

During PRA study several important issues were elaborated and discussed during the general discussion and focus group discussion. Alike all natural features, especially life forms local communities are sensitive to seasonal variations. Peoples mobility, workmanship, livelihoods and resource use pattern varies as the season changes over the year. The assessment emphasized on several issues of peoples' livelihood and activities in resource uses include unemployment, Solvency, Accessibility to Forest, Transportation Facility/Easy Mobility, Brickfield/Sawmill Operation, Forest Patrol, Agricultural Activities, Timber Felling, Fuel Wood Collection, Bamboo and Cane, Building Materials, Hunting, Vegetable Collection, Betel Leaf Vain cultivation, Sand Extraction, Sun grass, Damages by Elephant.

The seasonal trend of resource exploitation is variable round the year. Fuel wood is mainly collected during winter (dry season), as it is easier to enter into the forest at that time (in the month of Poush-Chaitra) and the fuelwood remain dry for easy use. Around the FWS, unemployment prevails during Vadra-Kartik and consequently for further duration of Asar-Kartik is the most insolvent period for the communities. Seasonal movement and activity pattern, derived from PRA discussion, is shown below:

Table 12. Seasonality chart on various matrices for FWS

Name of resources	Baishak	Jaistha	Asar	Srawan	Vadra	Ashwin	Kartik	Agrahayan	Paush	Magh	Falgun	Chaitra
Unemployment	0	0			000	0000	0000	00	0	0	0	0
Solvency	000	000						0000	000	000	0	
Accessibility to forests	00	00	0	0	0	00	000	000	0000	0000	000	0000
Transportation facility / mobility	000	00	0	0	0	0	0	00	000	0000	0000	0000
Sawmill	00	00						00000	000	000	000	000
Forest patrol	000	0	0	0	0	0	0	000	000	000	000	00
Agricultural activities			0000	0000		0		0000	000	000	00	0
Timber felling								0000	000	000	00	
Fuel wood collection	000	0	0	0	0	0	0	000	0000	0000	000	000
Bamboo & cane								00	00	00	00	0
Building materials								0000	000	000	000	0
Hunting	0	00						00	00	00		
Vegetable collection						00	00					
Sand extraction	00	00						00	00	00	0	00
Sun grass								00	00			
Damage by elephant	00	0				000	000	0	000	000	00	

#### 4.4. Socio-economic setting and dynamics

##### 4.4.1 Demographic Profile

**House Holds:** Village wise total house hold numbers have been collected from the secondary information and some cases during PRA/RRA conduction. A local estimate shows that there are about 5500 HHs inside the 16 villages of FWS and the total population is around 33000. There are also around 4000 HHs in the adjacent villages where the population is around 25000. The increasing rate of population is very high here due to illiteracy and lack of awareness.

Most of the people migrated from outside area of nearby coastal belt like, Badarkhali, Dhemosia, Kutubdia, Moheshkhali, and Coastal part of Chakaria due to severe cyclones in 1963, 1991 when most of the people became homeless. In the very beginning of their settlements they were completely dependent on forest for their alternative livelihood. But

recently as the forest resources has decreased remarkably and can not fulfill their demand and forest department are playing strong role in forest protection they are trying to find out other alternative options for their livelihood.

**Education:** HH interview shows that around 5-10% people are illiterate, 70-80% are educated in primary schools, 20-30% in the high schools and the rest 5-10% are educated in colleges and above. The literacy rate of female is higher than the male. From PRA it has been also revealed that due to Govt. facility for education, non formal education of some NGOs, and other awareness raising activities of NGOs the rate of literacy in increasing. But due to poverty most of the HH can not continue the education of their children after primary education.

**Occupation:** From the HH interview it has been found that the primary occupation of local people is Agriculture (around 55%), followed by Day laborer (around 15%), fuel wood collection (around 10%), salt cultivation (around 3%), tobacco cultivation (around 2%), small businessman (around 5%), Rickshaw puller (around 3%) and others (around 2%). But the most remarkable matter is that some occupation and percentage of occupation varies from season to season based on availability and scope of works. Another remarkable findings of PRA is that some of the local people engage in fuel wood collection and even in illicit felling as a secondary profession.

**Unemployment:** From HH interview as well as PRA it has been found that around 30% people of the sanctuary area are unemployed. But in some seasons particularly in rainy season the percentage of unemployed people is more and at that time it is around 40% due to less scope and unavailability of works. On the other hand most of the people have permanent jobs. No permanent unemployment was found in very poor and illiterate groups. Around 55 % people told that they have some sort of works in the whole year and the other people told that they become workless in a few specific period of a year. The day laborers to work in salt cultivation and agricultural field get work for around 6 months but everyone do not get this opportunity in everyday. In that day those people remain workless. During that workless time they engage themselves in collection of fuel wood and some of them sell these fuel woods to nearby market.

#### **4.4.2 Livelihood analysis**

**Income Source:** Agriculture is the main source of income for around 55% HHs, followed by day laborer 15%, and others 5%. Around 20% HHs have no secondary income source.

**Richness-poverty level:** Around 60% HHs are landless particularly those who are living inside the sanctuary area. From the HH inter it has been found that around 70% HHs are extreme poor and the rest 30% HHs are poor and middle class. Wealth ranking in FGD shows the following distribution: poor 70%, ultra poor 10%, middle class 18% and rich 2%.

**Land ownership:** From FGD and HH interview it has been found that around 60% HHs are landless and the rest HHs have homestead land of their own. On the other hand, 40% HHs has cultivable land and the rest HHs have no cultivable land.

**Livelihood expenses and food consumption:** What they think about their earnings is adequate to meet for managing their family expenditure. In response of it 50% informed that their earning is quite adequate for managing their family expenses whereas other told it not.

**Availability of food:** To know the status of food when they were asked in various GD, they replied that only 15% HHs has a surplus food, while around 50% mentioned that they have neither deficit nor surplus food. The rest 35% HHs told that they have a food deficit round the year. Food deficit are very common in very poor and lower middle class households. Food deficit varies from season to season. It depends on availability and scope of alternative source of income.

**Credit:** Around 65% HHs receive credit from different sources particularly from the NGOs. Some also take credit from some banks like, Grameen Bank, Krishi Bank, Islami bank etc. The major credit providing NGOs are BRAC, ASA, Proshika, Coast, Digonta, Islami Bank etc. The female (around 80%) take loans from the NGOs and most of the male take loans from the Banks.

**Local skill and skill development/AIGA opportunities:** During HH interview it has been found that only 20% HH people has some sorts of skills in the field of poultry, fish culture, cow patenting, bamboo and cane made handicrafts etc. But most of them do not have any skills due to lack of trainings and other facilities like, initiative (15%), lack of capital 75%) and the rest 10% do not have such interest. But in recent years some NGOs are providing skill development trainings in many areas of IGA that is not sufficient as per requirements. During RRA/PRA conduction it has been found that there is huge scope for the development of skills in some fields which are:

1. Improve Energy Saving Cooking Stoves,
2. Bamboo Cultivation and Management,
3. Nursery Development,
4. Poultry Rearing,
5. Forest Resources Management,
6. Cow Patterning,
7. Fish Culture and Management,
8. Bamboo and Cane Made Handicrafts,
9. Homestead Vegetable gardening,
10. Jujube Orchard (Apple and Bao Kul) plantation and Management,
11. Small Trading,
12. Eco-rickshaw puller training,
13. Eco-tour Guide Training,
14. Ecotourism and its importance,
15. Homestead Tree Management,
16. Homestead Plantation etc.

***N.B. It will be better to provide AIGA after conduction of trainings in the field that is mentioned above.***

#### **4.5 Uses of forest and forest resources**

For many reasons local people use forest resources. The cause and Effect-Ranking shows that people fell timber for various reasons. Involvement of influential people is the main problem for timber felling. People collect fuel wood for HH consumption, unemployment, poverty, and alternative source of income. Due to poverty people collect fuel wood, also encroach in forest land.

Table 13. Cause and effect ranking (understanding underlying facts)

<b>Name of resources</b>	<b>Timber selling</b>	<b>Fuel wood collection</b>	<b>Bamboo &amp; cane collection</b>	<b>Encroachment</b>	<b>Hunting</b>
<b>Identified problems</b>					
Poverty	0000	00000	000	0000	0
Unemployment	000	00	000		
Additional income	000	00	000		0
Forest cases	00	0		00	
Insufficient income opportunity	000	000	00		

Name of resources	Timber selling	Fuel wood collection	Bamboo & cane collection	Encroachment	Hunting
<b>Identified problems</b>					
HH consumption	0	00000	000		0
Insufficient/Poor forest patrol	000	0000	000	00	00
Easy negotiation	000	00	0	0000	
Lack of control over forest by FD	000	000	00	0000	0
Transportation Dev.	000	000	000	00	
Traditional practice	0	000	0	00	
Involvement of influential people	00000			00000	
Sawmill/Brickfield	00	0000			

#### 4.5.1 Fuel wood collection from the Wildlife Sanctuary

A huge amount of fuel wood is collected from the sanctuary everyday. All the HHs of surrounding and inside villages of the sanctuary is totally dependent on sanctuary for their HHs consumption. Beside this a number of HHs is dependent on Fuel wood collection for their earning and livelihood.

All fuel wood requirements of inside HHs and at least partial demand of HHs in adjacent villages are met from the forest. Besides, fuel wood collections provide primary and secondary occupation for many HHs. Mainly children; women and poor people collect fuel wood. A huge amount of fuel wood is used in HHs consumption and substantial quantity of fuel is transported to other areas. Fuel wood collection is going on all seasons but more extensive in the dry season. Usually they cut the seedlings and saplings that posse a threat to the forest and its resources.

Many children, women as well as poor day labor, adult and some cases the old people also involved in this activity. Most of the cases they enter into forest individually for collection of fuel wood. But some time, they also go by groups.

Mainly at daytime they collect fuel wood. All of the collectors are local inhabitants of those villages that are located inside or adjacent of the sanctuary, the following figure shows the collection and processing of fuel wood from the wildlife sanctuary

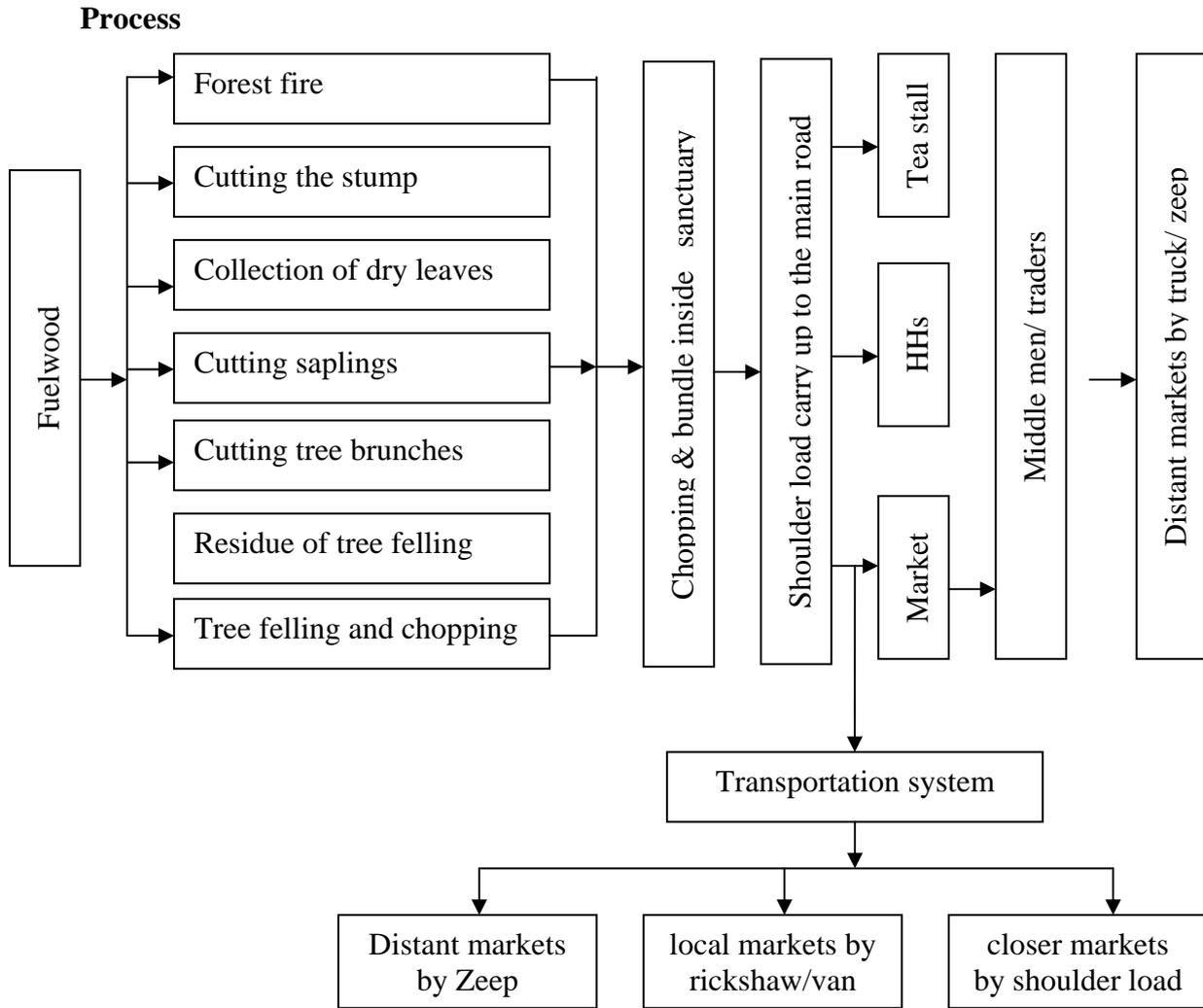


Figure 4. Flow diagram on fuel wood collection and processing

Almost all the settlements are involved some extent in fuel wood collection. This why as per request of Beat officers and other FD officials, the PRA team visited in some villages and organized some awareness meeting with the villagers to motivate them for not cutting the saplings and valuable trees newly.

Several process of collecting fuel wood has also been identified during PRA. Local people collect fuel wood by 6 processes like for collecting fuel wood in the dry season (Chaitra & Baishakh) they make fire into the dry leaves or dry trees. It burns all the trees and sapling of a certain area. Then they collect the unburned trees, its branches as fuel wood. Another process is cutting the stumps of trees especially Jam, Garjan and Shegun, it disturbs the natural regeneration. Another process is cutting canopies, after the illegal felling of a tree the fuel wood collector cut the canopies and chopping it then carry it

.Another process is cutting the planted sapling by two process i.e. just immediate after cutting they carry it. Another is after cutting; they put it into the forest for few days. After being dry, they carry it to their house. They also cut the tree branches as fuel wood. Residues of felling trees are also collected by them as fuel wood. Sometime for the collection of fuel wood, they fell a tree and chop it into the forest and carry it like fuel wood.

The under lying cause of collecting of fuel wood also collected during PRA and RRA. It was expressed in FGD with local community and fuel wood collector that the under lying causes of fuel wood collections are: there is no alternative source of fuel for HHs consumption, most of the people of the area is very poor, so some of them find no other alternative, has taken fuel wood collection as their source of income for their maintaining livelihood. Beside this fuel wood is also available, easy access to forest, source of extra income, having demand in the local market are main causes of collecting fuel wood.

**Dependency on fuel wood collection:** Maximum fuel wood collector is not fully dependent on fuel wood collection for their livelihood. But for the HHs consumption, the locals are fully dependent on sanctuary. For extra source of income maximum poor people are partially dependent. But during PRA, it was identified a number of people (20-25% of total people) who are fully dependent on fuel wood collection for their livelihood. Own fuel wood needs of HHs and tea stall owner and some middlemen engage in fuel wood business encourage them to collect fuel wood.

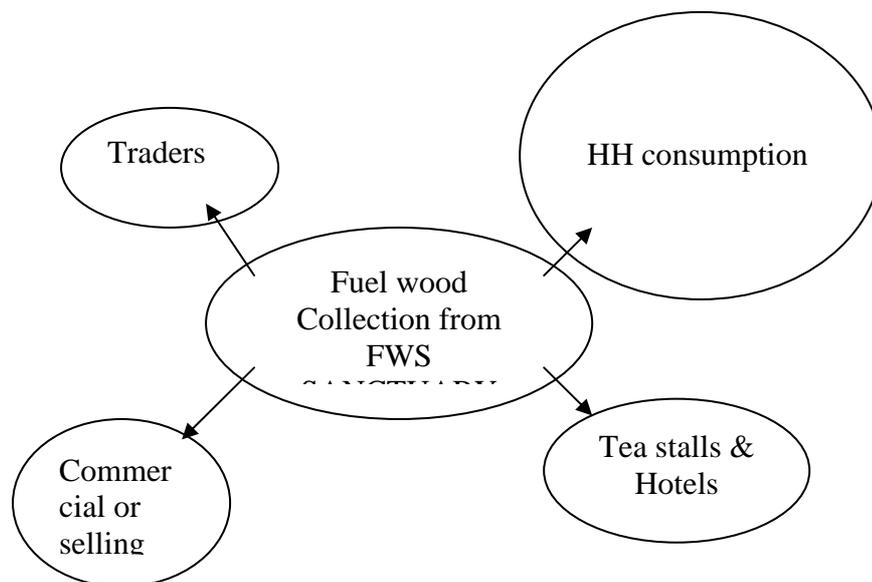


Figure 5. Venn diagram of fuel wood consumption.

There are various use of fuel wood was also found by the PRA team. HHs is the major consumer of fuel wood, consumption by tea stall, hotel. The rich men do not collect fuel wood directly from the forest, they purchase from the poor. Also they engage some labor in this activity.

The extent of collecting fuel wood is high, each day around 700-800 women, children and some young people enter into the forest for collecting fuel wood. Most of the people go once in a day, but few go twice a day. Each time women, children and old men collect one tara, however the adult male can collect two tara. Each tara cost 50-60 tk. contains 20-30 kg. Another system is collection of piece/stump fuel wood by kharang. The other system is poza (shoulder load). There exist no opportunities of alternatives that can easily introduce. Almost each HHs owned livestock. The cow dung can be used as alternative fuel source. Also bio-gas plant can be established and introducing improve energy efficient cooking stoves may be the best option for reducing pressures on fuel wood collection.

Fuel wood collection has a serious impact on forest. Though some FD staff and local people found no impact on forest but in fact for these activities, forest is decreasing, natural regeneration is not occurring, several planted sapling is damaging, and wild life is losing their food bearing trees.

If the fuel wood collecting activities is stopped immediately by the authority, then it will make risk on the stakeholders and their livelihood. Then they could not find the fuel or energy sources for domestic consumption, income may decrease of some people, a number of people may cut down all the planted trees and may make a massive destruction of the forest if this activity is stopped by the FD not creating any alternatives.

The figure 4 shows the fuel wood movement from the sanctuary. The fuel wood from the sanctuary collect by the villagers and carried as shoulder load to the village and nearby market. From the local small market carried to the nearby comparatively large market by van or rickshaw. Some time from the villages the stuck of fuel wood is also carried by van or rickshaw and sometimes by Jeep. Then from the nearby local market fuel wood is carried to nearby three large markets. Dulahazra is one of the large markets, from Dulahazra fuel wood is transported by jeep or truck to Moheshkhali, Dholghata,

Matharbari, Bodorkhali, Kutubdia, Chiringa etc. In Dulhazara, a number of fuel wood traders collect and deposit fuel wood. Another large market is Malumghat Bazar, people bring wood to there by their shoulder, van or rickshaw. Another big market of fuel wood is Moghbazar under Chiringa Union and fuel wood is transported by jeep or truck to Moheshkhali, Dholghata, Matharbari, Bodorkhali, Kutubdia, Dorbeshkata, Ilishia etc.

Non timber forest produces particularly bamboo and canes are another source of income and useful resources of forest for the local people. They collect bamboo and cane homestead and some cases for commercial purposes that are shown in the following figure.

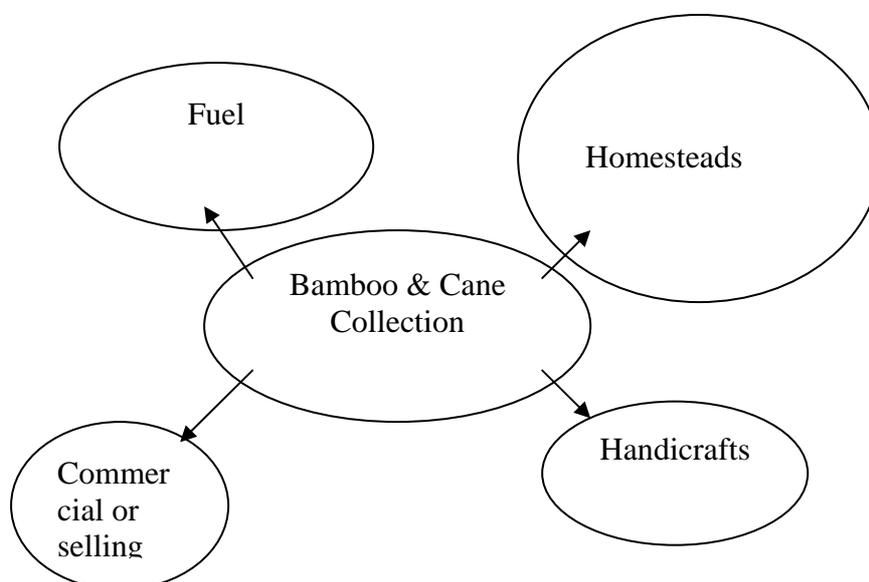


Figure 6. Venn diagram of Bamboo & Cane consumption.

**Role of fuel wood traders:** A substantial quantity fuel wood is transported everyday from the sanctuary area and locally marketed. The name of the shop owners and local timber traders has been collected. Several transport such as rickshaw, van, jeep, trucks of fuel wood are transported everyday from the sanctuary area.

**Local collector.** Sometime the fuel wood merchant engage day laborer for tree felling that is raising tension for the sanctuary. In nearby market especially in Malumghat and Dulhazara station everyday a huge amount of fuel wood is sold.

#### **4.5.2 Illegal tree felling:**

Widespread tree felling in the past contributed to the qualitative and quantitative reduction in forest and its resources. Illegal tree felling is still going on significantly in the sanctuary. There are some armed gangs are involved in tree felling back by local elite/politicians.

Mainly adult, as well as poor day labor and some cases the old people also involved in this activity. Most of the cases the illegal feller come from out side but some local people as well as forest villager help them in this activity. Most of the cases they enter in forest by groups for felling trees particularly at night. But also at daytime some local and illicit fellers fell trees. Influential people, political persons and some cases FD are behind these felling activities.

This tree is mainly felling for commercial purposes. Causes for tree felling are easy, portable and FDs loose moral. The poor day labor that fell trees directly is partially dependent on this activity for their livelihood.

An astounding account of how the remnants of the natural stands in the sanctuary vanish was given by the local people who included gang leaders involved in illegal logging. According to the local people, organized wood smugglers patronized by local elites and some dishonest forest officers and guards. Besides, illicit harvest is done at individual level also. Almost all of the illicit feller is poor and their livelihood is partially dependent on this activities. Timber merchant, local political influential persons are indirectly involved in tree felling, they usually engage very poor villager in tree felling by daily basis. Many local HHs also collect small trees as building materials as their house building material and for making furniture. In some places, Headmen and forest villagers are involved in tree felling and have strong negotiation with the syndicate and FD. There is a big market of illegal timber selling in Moulvirkum, Chiringa, Moghbazar and Dulhazra. Illegal timber also sold in nearby market. It also transported to Chittagong, Dhaka and other districts. According to the local people, the FD personnel in some cases have arrangement with the illegal feller. In some cases the illegal feller are more powerful bearing a gang of armed group. The process of illegal timber felling appears to occur in 4 ways:

1. Groups of poor people from villages inside or around the forest, who collect timber without any prior negotiation with the FD.
2. Groups of poor people from villages inside or around the forest, with collect timber after prior negotiation with the FD.
3. Groups of poor people employed by middle men, after negotiation with the FD.
4. Some poor people back by local elites/politicians without negotiation with FD.

#### **4.5.3 Hunting and killing of wildlife:**

Widespread hunting existed in the past. Presently, the activity is limited. However, still it is going on. In particular deer, Jungle hen, birds, jungle fowl, turtle, wild boar, wild pig etc. are hunted. Many of wildlife species including snakes, foxes etc. are killed when they encountered by local people.

Forest villagers are the earliest settlers in FWS and adjoining forest reserves. During mid 60's few people from nearby off-shore islands and coastal frontiers are invited to assist FD personnel in forest resource extraction, management and protection. FD provided them one acre of land for housing and two more acres for agriculture cultivation. Over time these settlers grew in HH size and encroached more land than allocated from the Department. Further, in some cases, forest villagers collaborate with timber poachers and encroachers of forestland as found during key informant interview of the PRA. In two forest beats of FWS, registered forest villagers are as follows:

**Table 14: Information on forest villagers and other settlers inside the FWS**

<b>Name of villages</b>	<b>Registered forest villager HHs</b>	<b>Original settlement/ year</b>	<b>Other settlers</b>	<b>Original settlement/ year</b>	<b>Remarks</b>

Table 15: List and location of sawmills/Brickfields around the FWS

Name of Saw mill	Village/ location	Distance from the FWS	Remarks
	Moulavir Kum	4 km	2 nos.
	1 No. Dam	3 km	2 nos.
	Palakata	4 km	1 No.
	Mogh Bazar	5 km	1 nos.
	Bans Ghata	4 km	4 nos.
	Haider Khali	4 km	2 nos.
	Shikal Ghata	4 km,	3 nos.
Mujibur Rahman Gong	Boiragirkheel (Dulhazara)	2 km	01 nos.
Shah Alam	Boiragirkheel (Dulhazara)	2 km	01 nos.
Khaled Chey	Boiragirkheel (Dulhazara)	2 km	01 nos.
Jasim Uddin	Boiragirkheel (Dulhazara)	2 km	01 nos.
Alam Mistri	Boiragirkheel (Dulhazara)	2 km	01 nos.
Aslam Chey	Dulhazara	2 km	01 nos.
<b>Brick Fields</b>			
Bashar Chairman	Shapergara (Lama)	4 km	01 nos.
Nur Hossain Gong	Hargaza	4 km	01 nos.
Pearo gong	Bogachari (Lama)	4 km	01 nos.

#### 4.6 Local community, power structure and governance

Since early 80s FWS is experiencing biophysical changes like conversion of natural forests to plantation forestry and during 1990s and onward exploitation got momentum and significant changes in its socio-political and biophysical features. Local power structure as well as wildlife political arena has a significant impact over the resources of the sanctuary. PRA findings enumerated the status of various issues identified like population growth, income and employment status, income from forests and household needs, livelihood expenditure, literacy, homestead plantations, mobility, food security, credit and AIGAs, major occupation and human-animal conflicts prevail in inside and surrounding communities based on general discussions, FGD, key informant interviews and other PRA tools as cited in table below.

Table 16: Trend analysis of socio-economic situation

Socio-economic Issues	Pre 1971	1990	Present (2009)	Causes of change
Settlement/ population	00	0000	00000	Settlement started after 1950 cyclone; population is increasing
Solvency/ income	0000	000	00	Price hike, low income and less scope for work.
Livelihood expenditure	00	000	0000	Price hike of consumables, population growth
Literacy	0	000	0000	Mass awareness, education program of NGO and GO
Unemployment	0	00	0000	Population growth, less scope for work
Use of forest for income	0	00	000	Easy access, free goods in the forests, increasing population, poverty
Use of forest for HH needs	0	00	000	Less alternatives for local poors, Easy access, free goods in the forests, increasing population, poverty
Transportation and mobility	0	00	0000	New roads, culverts, bridges, telecoms network
Homestead plantation	0	00	000	Awareness, NGO involvement, less trees in forests
Food insecurity/ starvation	0	00	000	Increased population, poverty, less scope for AIGAs
Credit and IGA	-	00	0000	NGOs & Banks provide credit and AIGA supports
Occupation	Agriculture	Agriculture, Day labour, Tree felling	Agriculture, Business, Day labour, Tree	New occupations are emerged

Socio-economic Issues	Pre 1971	1990	Present (2009)	Causes of change
			felling	
Human-elephant conflict	0	000	00000	Habitat destruction, shortage of fodder
Livestock	000	00	0	Shortage of space, mechanized agriculture
Agricultural activities	00	000	0000	Conversion of forest land into agricultural lands

Local elites including political and administrative influential personalities has significant stake over the resource exploitation and uses. Some of these personalities have strong influence over resource management. As legal custodian FD, forest villagers as helping hands of FD, local businessmen, members of local government, public administrative agencies comprising a small segment of resource say 10% of entire resource user populace have significant influence whereby in most cases excessive exploitation of resources is being inevitable. Alongside, there exists civil society members sometimes act as counter force of the earlier ones. At the bottom line, huge poverty stricken communities in and around the forest reserves are also backed by and within their grips. Some of the powerful elites are named as below.

Table 17: List of powerful and influential persons in FWS and surrounding areas.

Sl.	Name	Designation/ occupation	Address/ location	Remarks
1	Mr. Sayed Hossain		North Sairakhali	
2	Mr. Abu Faiz		North Sairakhali	
3	Mr. Md. Jakaria		North Sairakhali	
4	Mr. Ledu Mia		North Sairakhali	
5	Mr. Nurul Alam		North Sairakhali	
6	Mr. Nasir Uddin		North Sairakhali	
7	Mr. Jainal Uddin		North Sairakhali	
8	Mr. Mamun		South Sairakhali	
9	Mr. Shah Alam		South Sairakhali	
10	Mr. Kungal Jolodas		South Sairakhali	
11	Mr. Horidhar Jolodas		South Sairakhali	
12	Mr. Manik		South Sairakhali	
13	Mr. Zafar Alam		South Sairakhali	
14	Mr. Syad Khan	Head man	South Sairakhali	
15	Mr. Nurul Islam	Head man	South Sairakhali	
16	Mr. Muktar Ahmed		Sagirshah Kata	
17	Mr. Abdur Rahman		Sagirshah Kata	
18	Mr. Mohammed Ali	Member	Sagirshah Kata	

Sl.	Name	Designation/ occupation	Address/ location	Remarks
20	Mr. Sarwar Alam		Sagirshah Kata	
21	Mr. K. M. Salauddin	Ex. Chairman	Palakata	
22	Mr. Sahab Uddin	Ex. MUP	Palakata	
23	Mr. Abdu afar	Ex. MUP	Palakata	
24	Mr. Enamul Hoque		Palakata	
25	Mr. Jamal		Palakata	
26	Mr. Azizul Hoque	Chairman, Fasiakhali UP	Khondakar Para	
27	Mr. Rezaul Karim	Upazila Chairman	Dulhazra	
28	Mr. Aslam Chey	MUP	Dulhazra	
29	Mr. Saiful Ehsan	Chairman	Dulhazara	
30	Mr. Kamal Hossain	Ex. Chairman	Ulubonia	
31	Mr. Gias Uddin	Ex. Chairman	Khondakar Para	
32	Mr. Kamal	Member	Khondakar Para	
33	Mr. Abdul Mannan Moulavi		Khondakar Para	
34	Mr. Md. Hossain		Rajar Beel	
35	Mr. Rahmat Ali	Member	Rajar Beel	
36	Mr. Saiful Islam		Rajar Beel	
37	Mr. Sirajul Islam		Rajar Beel	
38	Mr. Md. Abul Kalam		Rajar Beel	
39	Mr. Shamsul Islam		Rajar Beel	
40	Mr. Surat Alam		Charar Kul	
41	Mr. Shamsul Alam		Charar Kul	
42	Mr. Faridul Alam		Charar Kul	
43	Mr. Abul Kashem		Charar Kul	
44	Mr. Ameer Hossain Kalu		Charar Kul	
45	Mr. Golam Kader	Contractor	Ghonarpara	
46	Mr. Alam	Ex. Member	Ghonarpara	
47	Mr. Jalal Ahmed		Ghonarpara	
48	Mr. Bodoruddoza		Ghonarpara	
49	Mr. Shamsul Alam		Ghonarpara	
50	Mr. Kabir Ahmed		Ghonarpara	
51	Abdul Hakim		Ghonarpara	
52	Mr. Nurul Islam	Headman	Ghonarpara	

Similarly few timber poaching groups are active around the PA who are constantly backed by and patronized by the local business saw mill owners, furniture making shop owners and obviously by the local administrative and political elites. These well-known working as paid labour forces. Some of them are as follows:

Table 18. Timber Poaching Groups in FWS

Villages	Name of Groups	Remarks
Sairakhali	Mr. Nazu Babu Group	
Khondaker Para	Mr. Azgar Ali group	
Khondaker Para	Kalu Headman group	
Ringbong	Ameer Hamza Group	
Ghonar Para	Nuru Headman Group	
Palakata	Sayed Alam Group	

Another socio-economic driving force active in the area is NGOs who has strong presence in the local communities providing several services like education, health care, micro-credit and awareness building. Some of them are like:

Table 19. Information on NGOs active in FWS

Sl.	Name of NGOs	Area/ location of work	Activities
1	BRAC	Chakaria Thana	Pre School Education
2	Grameen Bank	Chakaria Thana	Micro-credit
3	ASA	Chakaria Thana	Micro-credit
4	Coast, Bangladesh	Chakaria Thana	Micro-credit
5	Digonto	Chakaria Thana	Micro-credit
6	Proshika	Chakaria Thana	Micro-credit
7	SERPV	Chakaria Thana	Health care and primary education
8	BASTOB	Chakaria Thana	
9	Krishi Bank	Chakaria Thana	Micro-credit
10	Agrani Bank	Chakaria Thana	

#### 4.7 Local conflict, Conflict resolution, social adhesion and cohesion

Since the FWS and its landscape is the home of a number of stakeholders namely FD as legal custodian, political elites as peoples' leaders, growing population in and around the FWS and local business leaders as illegal timber poachers and encroachers are often in conflicting situations. Some of these issues like land dispute, family affairs, political conflicts, monetary dealings, kids matter, establishment of local influence, forest encroachment, tree felling and man-elephant conflict etc are identified and its resolution process are discussed during the PRA as below:

Figure 7 indicates the main reason and sources of conflicts at FWS. Land disputes over illegally occupied are the most vital issue for conflicts followed by money lending, other financial matters, family affairs, Rohingya settlers, kid's matters etc. at FWS. Further,

table 7 shows the sources of conflict and its resolution and figure 8 illustrates the process of conflict resolution as conceived through the PRA at FWS

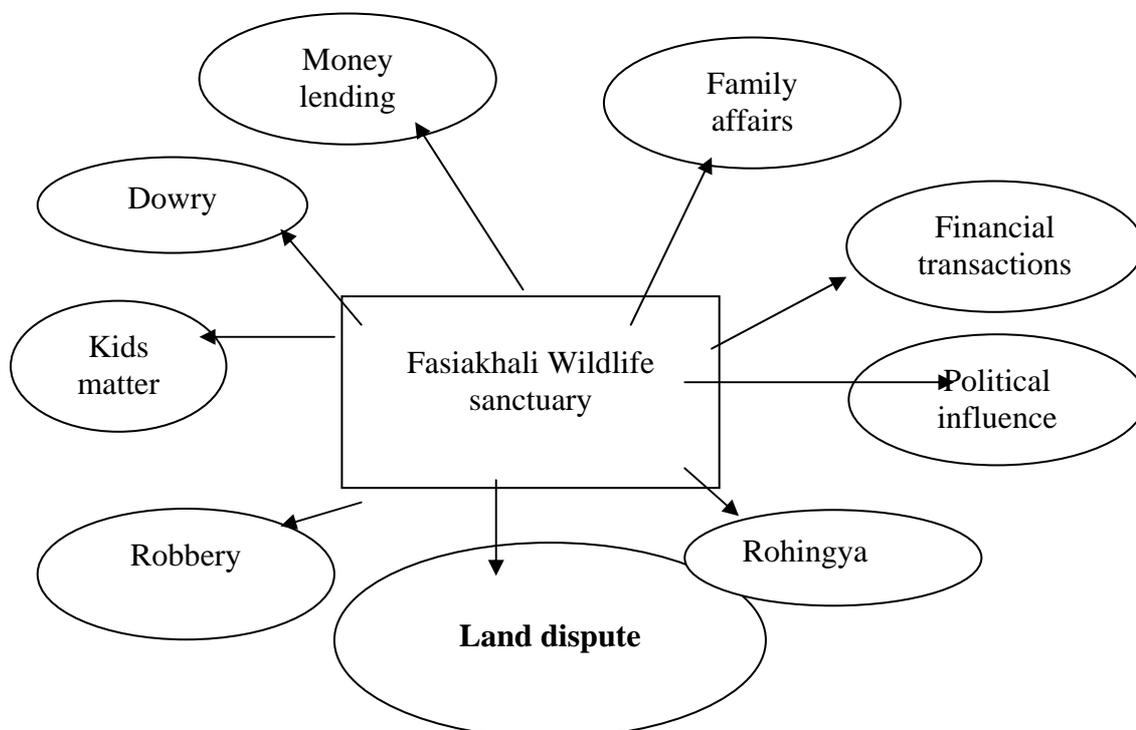


Figure 7: Venn diagram: Sources of Conflict

**Conflict with FD:** Due to encroachment and illicit felling, forest cases by FD staff, prevention in resource exploitation are the main reasons of conflict with FD by the local people.

**Conflict Resolution Mechanism:** The local level conflicts at FWS are resolved in several ways. Generally most of the conflicts are resolved by Gameen Salish with the help of age old persons/head of the communities (locally called Sarders) and elite persons. Some other conflicts are also resolved by UP members/Chairman. In case very serious conflicts like, murder people take the help of police and local Upazila Chairman/MP to resolve the conflict.

If the conflicts arise due to forest land disputes, people often go to nearby forest office to resolve the conflict.

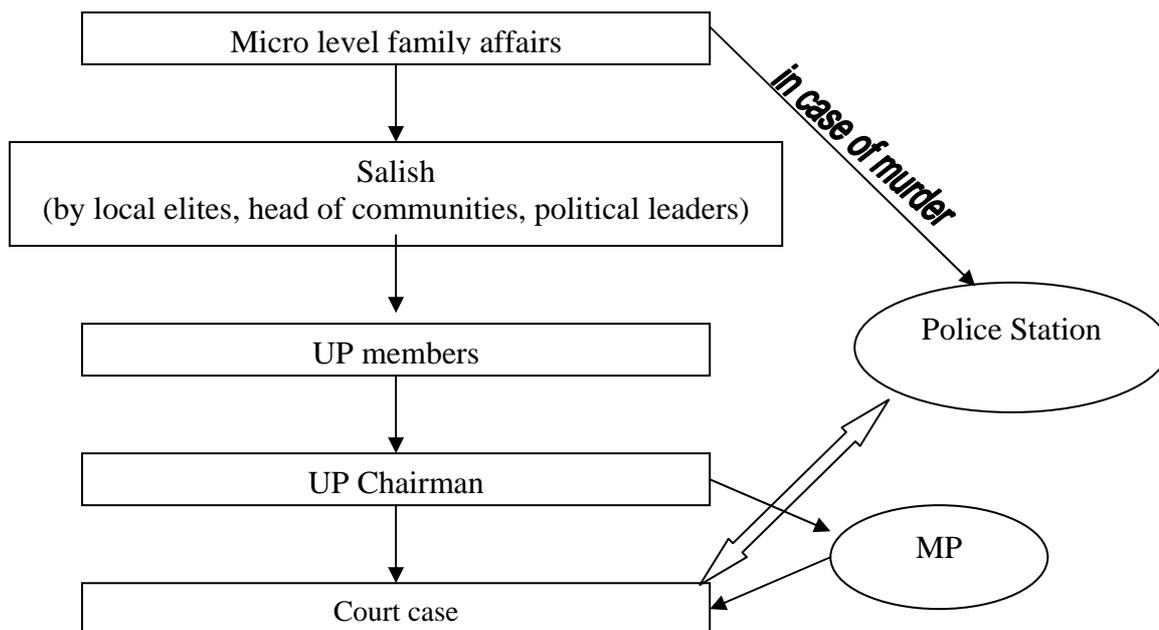


Figure 8: Different steps followed in conflict resolution.

**Social cohesion:** No significance occasions are identified during PRA/RRA except as usual occasions like, Eid-ul-Fitre, Eid-ul-Azha, Oaz Mahfil, marriage ceremony are the main festivals/reasons for social adhesion.

Table 20. Sources of conflict and its resolution

Sl.	Sources of conflict	Resolution mechanism
1	Land dispute	Local chairman, UP members, forest personnel and finally by the police station and court
2	Family affairs	By arranging local <i>salish</i> supervised by village elders and UP members
3	Political conflicts	Local chairman, UP members and court
4	Monetary dealings	By arranging local <i>salish</i> supervised by village elderly peoples and UP members/ Chariman
5	Kids matter	By arranging local <i>salish</i> supervised by village elders and UP members
6	Establishment of local influence	UP members and court
7	Forest encroachment	By local forest personnel and villagers
8	Tree felling	By local forest personnel and villagers
9	Man-elephant conflict	Villagers drive elephants away from villages

#### 4.8 Local problems and expectations

In the local community migrating populations and their poverty is one of the major challenges followed by unemployment. Other problems namely fuel wood scarcity,

damage by wild elephants, education, dowry and polygamy are other notable ones. Following table ranks the problems according to their severity, causations, probable solutions and expected interventions from IPAC.

Table 21. Ranking of local problems and enquiry into its solution

<b>Problems</b>	<b>Ran king</b>	<b>Reasons</b>	<b>Solution</b>	<b>IPAC interventio ns sought</b>
Population pressure	10	Lack of education, awareness, religious superstition and entertainment	Promote family planning, awareness, education and entertainment	Arrange social awareness campaign
Poverty	9	Lack of alternative income source, Unemployment, lack of capital to initiate business	Should create new AIGAs based on their skill and opportunities, introduction of improved variety fruit spp plantation and credit without interest	Skill developme nt training on Bamboo-made products and handicrafts , especially cap, eco-tourism etc.
Unemployment	7	Lack of job opportunity, education, skill and population boom	Skill development training and education	Introduce skill developme nt training, AIGAs, eco-tourism, linking between skill developme nt and financial agencies
Fuel wood scarcity	8	Forest destruction, lack of bushy plants, insufficient space for homestead plantation	More plantation in the forests, restriction on unregulated fuel wood collection and introduction of ICS, biogas plant	More plantation through participatory approach; Introduce ICS &

<b>Problems</b>	<b>Ran king</b>	<b>Reasons</b>	<b>Solution</b>	<b>IPAC interventions sought</b>
				biogas plants in large scale
Damage by elephants	7	Destruction of elephant habitat, shortage of fodder species	Habitat restoration, awareness building	Fodder plantation and local awareness building
Communication	2	Easy communication facilitate illegal removal of forest resources	More patrol, enforcement of law, awareness	Strengthen FD capacity with vehicles and arms and fuel, Ensure community patrolling around the FWS
Robbery/ thief	4	New <i>Rohinga</i> settlers, unemployment, poor enforcement of law	Enforcement of law, Social movement, creation of employment opportunities	Social mobilization, community patrolling
Health and sanitation	5	Insufficient health and sanitation facilities	Establishment of community clinics and linkage with GO/NGO health services	Awareness program on health and sanitation; linkage with GO/NGO health services
Education	6	Poverty and lack of awareness	Awareness campaign and poverty reduction	Expand NGO education program and awareness campaign
Early marriage	7	Social custom, unemployment, lack of awareness, illiteracy	Enforcement of marriage law; awareness campaign and promotion of girls' education	Awareness campaign

<b>Problems</b>	<b>Ran king</b>	<b>Reasons</b>	<b>Solution</b>	<b>IPAC interventions sought</b>
Dowry	9	Social custom, unemployment, lack of awareness, illiteracy	Enforcement of marriage law; awareness campaign and promotion of girls' education	Awareness campaign
Polygamy	5	Social ill custom, lack of education, family tradition	Prohibition of early marriage, social awareness	Awareness campaign

#### **4.9 Forest management regime**

Cox'sBazar Forest Division was created in 1920 and separated from Chittagong Forest Division to intensify forest management. During 1932 to 1951 this new forest division was merged into Chittagong Forest Division. Later in 2001 Cox'sBazar Forest Division was split into Cox'sBazar North Forest Division and Cox'sBazar South Forest Division. Usually Forest Management Plans are developed for the entire Division. During 1988-97 Bamforth and N.I Hawlader's Management Plan, 1991/92 to 2000/01 Dr. Jahangir Haider Chowdhury's Management Plan and Finally during 2000/01 to 2008/09 Mr. Abdul Mabud's Management Plan is going to be expired this year. These plans proposed raising new plantations, rotation-age-based thinning and regeneration cuts followed by plantations. During these plan periods extensive conversion of natural forests to industrial plantations, introduction of exotic species as short rotation species and above all extended felling ban etc. resulted into unregulated felling of valuable timber species and encroachment all over the forest Division. Fasiakhali Wildlife sanctuary was not exception to this scenario. Besides, this PA is declared as Wildlife sanctuary only in 2007 and prior to that significant deterioration in its stock and health occurred. However, though there is no provision of regeneration cut in the PAs, a management inventory is to be conducted in the sanctuary area to assess its stock assessment and growth of its resources to develop conservation management plan for the FWS. The management plan would also entail the features of collaborative management plan for the PA and its landscape. The plan would prioritize improvement of livelihood of stakeholder communities as well as improvement of habitat in the FWS.

Table 22. Manpower involved in management of FWS.

Beat Office	Ranger	Deputy Ranger	Forester	Forest Guard	Watcher	Boat man	Mali
Fashiakhali	1	1	2	6	1	-	1
Dulahazara		1	2	4	-	1	3

#### **4.10 Crosscutting issues**

##### **4.10.1 Resource user groups**

Fourteen stakeholders identified through PRA in management of FWS. As Government has banned any systematic and legal harvesting of major forest produces from the reserve since 1972, illegal harvesting of fuel wood, poles, bamboos, canes and sun grass got momentum for domestic as well as commercial purposes. During PRA studies timber poachers, fuel wood collectors, land encroachers, NWFP collectors, sawmill owners and labours, furniture marts etc. are identified as primary resource user groups in the FSW. These communities need to bring under interventions of IPAC in a priority basis.

##### **4.10.2 Gender issues**

This area is dominated by Muslim religion with over 90%. People are very much conservative regarding gender issues whereby women are mostly passive in their roles and maintain *hijab*. In case of literacy Girls are more visible (about 60%) than boys at primary level. Provision of early marriage cause gradual decline of female education at higher levels. In family level decision making process usually male takes ultimate decision though sensitive issues like marriage of son/daughter, land sale/purchase etc are discussed with their spouses. Recent trends of micro-credits and different loan services provided by the NGOs, female are being preferred which eventually empower rural women economically as well as in family decision-making. Surrounding villages still shows the symptoms of polygamy, dowry and large (avg. 6 kids) family size etc. which reflects undermining status of womenfolk. However, women performs a wide range of activities at household level and even outside works. In case of the involvement with FWS, women of all ages participate in fuel wood collection, marketing and selling to the nearby markets. Female-headed HHs is relatively poor and mostly dependent on forest resources for their livelihood.

### **4.10.3 An unique Eco tone**

An ecotone is a transition area between two adjacent ecological communities i.e. ecosystems and manifests as a sharp boundary line. Both the ecosystems has its own bio-physical features and varied species of plants. At Fasiakhali area the presence of mangrove species Sundri at the closest proximity of tropical forest species like Garjan is an spot of high biological importance. Prior to leasing Chakaria Sundarbans for shrimp cultivation, this area gradually blended interface a significant presence of both the ecosystems. However, now both are at a stake; expansion of agriculture and human settlements made significant deterioration. Today only 10-12 no. of large Sundri mother trees are found at this place. This area has high potentiality to rennovate and can be brought its unique features back with IPAC interventions.

### **4.10.4 Chakaria Sundarban**

Chokoria Sundarban was one of the oldest mangroves of this sub-continent covering an area of about 8540 hectares was declared as reserved forest in 1903. Indiscriminate cutting of trees for fuel wood and salt manufacture in the locality caused depletion of the forest and its growing stock. The process of deforestation got momentum in the sixties. However, the ruthless destruction of forests was accelerated when government decided to transfer 3205 hectares of land to shrimp culture and human settlement during 1977-1982 claiming wrongly that the area was too saline for the growth of mangroves (Siddiqi 2001). During 1981-1990, deforestation occurred at an alarming rate degrading the forest to an almost barren land.



Figure 9. Remnant Sundri in the Chakaria Sundarbans

## **Chapter 5: ISSUES and CHALLENGES**

Alike other PAs in the country, FWS is also facing multi-level challenges. These include lack of sustainable commitment and compassion from local political, business and administrative elites including FD. Over the years this forest is experiencing intensified over exploitation of her resources and eventually significant forest health loss occurred.

FD with its professional leadership in silvicultural practices and conservation of biological diversity in the PAs are adequate; what is missing is that human dimensions of PAs among the forestry managers and field personnel. Similarly growing settlements around the PAs and local administration are not adequately aware of the necessity of forest land, her resources, hills, unique flora and fauna with other non-wood forest products.

PRA findings and discussions strongly exhibits that FD along are not in a position to conserve and sustain biological diversity in the PAs. Further mere declaration of an area as PA did not control market demands as well as people's requirements. At micro level, a good number of stakeholders are meanwhile identified who has contrasting interests. Hence a win-win situation is difficult to achieve.

As PA resources are declining, pressures from surrounding villages for encroachment/settlement, fuel wood increases; with limited ma sanctuaryower FD claims to be incapable to withstand pressure and sometimes align with the local power structures.

Plantations of Dhakijam, Teak and Garjan in the FSW are remnant timber source in this area; forest patrolling is visibly the main activity of forestry personnel with least scope and time for other silvicultural practices to facilitate the natural regeneration and plantation to grow.

The neighboring settlements, tea stalls and restaurants are largely dependent of the sanctuary for their fuel wood consumption. Besides, with the speculation of price hike during the rains, each and every HHs and shops stored dry fuel wood for upcoming 3-4 months. Fuelwood collectors harvest almost all the young saplings, green or dry, except high value timber seedlings namely garjan, jam, teak and few others.

Seasonal poverty and unemployment of local people, during pre-harvest period of argo-crops, compels them to adopt fuel wood collection as their main source of income.

Within the FSW monoculture plantation of short-rotation exotic species like Eucalyptus, Aaccia etc under the social forestry programme is meanwhile established prior to declaration of this spot as a PA. But unlike other PAs or other parts of PA clear felling followed by artificial regeneration is being prohibited. The worst scenario will appear while the social forestry participants will face delayed or restriction on benefit sharing from their final harvests.

Forest villagers are claimed to settle in the PA adjoining areas during mid 60s; Their family size meanwhile increased geometrically and housing and fuel wood needs for additional people is gradually being a threat for the FSW. Besides, the new generation forest villagers are reportedly being involve in facilitating forest land encroachment for poor settlers from off-shore islands and coastal frontiers as well as illegally removal of forest produces. Further, local FD personnel are losing their control over these forest villagers as they are declining for systematic participation in forest patrol and operations.

The challenges from discriminatory faces of PA resources against less financially well-off segments of the communities like Jolodas para, new settlers need to address to ensure human dimension of the PAs. As we have enfranchised more and more people to participate in sanctuary and protected area decisions, we have raised the bar regarding issues of social justice and social compact.

Finally the major challenges appear while we hope for a win-win situation in a multi stakeholder environment. There is least consensus for biodiversity conservation as the PA is being threatened from high population pressure, higher extent of resource exploitation, significant business interests, unsustainable political vision, aggravating poverty, human-elephant conflict, loss of wildlife habitats, missing ownership over PA resources by local communities and administration. Such structural conflicts will be the most difficult part of IPAC endeavor to resolute.

## **Chapter 6: SUGGESTIONS and RECOMMENDATIONS**

In line with IPAC mandate, livelihood approach of PA management would be the best option for conservation of remnant biological diversity as well as well being of forest dependent communities. However, some FSW context specific initiatives can be adopted as below:

To ensure mandate and commitment of political, business, various departmental and other elites, more interactive approach should be adopted. Declaration of a particular forest patch as Wildlife sanctuary is entirely a technical issue from forest management perspective; it has other dimensions as well namely administrative and obviously political. Local political elites are seldom consulted during this process, which eventually creates problems like rehabilitation of poor slum dwellers into a forest or politicians favours the encroachers during election campaign. Hence during and after declaration of a PA, rigorous discussion and campaign should be carried out along with forestry technical procedures.

Strengthening capacity of FD field offices, particularly Beat Offices, are the potential entry points for ensuring co-management of natural resources for biodiversity conservation. Deploying adequate ma sanctuaryower and logistic supports with arms/ammunitions, vehicle, communication materials and adequate budget for mobilizing field staff should be ensured. Training of forest officials and staffs in human dimension of PA management is very crucial for the success of shift in PA management.

A rigorous inventory of biophysical status of the PA as well as its interface/landscape area could be the first steps; it should be followed by developing a base map for the same. Delineation of FSW boundary and its biophysical zonation for different interventions need proper demarcation. Delineation of core, buffer, landscape, conservation area, multiple use zones, sustainable resources use zones etc. need to follow easy identifiable features e.g. streams, roads, foot hills etc.

Steps should be taken to bring encroached forestlands under green coverage with participatory agreement. Large-scale monoculture plantation of fast growing exotic species should be avoided rather long-rotation indigenous timber and fruit species should be planted.

The western side of the FSW is heavily encroached by forest villagers and other settlers. In some areas, HHs are widely spaced and can be developed some sorts of model settlement in a concentrated area. It would bring more space for plantation of short rotation species in participatory basis.

Silvicultural operations like climber cutting, assisted natural regeneration, habitat improvement through fodder plantations, under planting with bamboo, cane etc. can be introduced in the core PA area. Degraded forests in buffer area and settlements should be brought under participatory plantations.

Local FD officials infer the forest villagers to be the potential threat of timber poaching and association in the process of encroachment. Since forest villagers are deeply rooted into forestry activities they should not be avoided in co-management institutions rather agreements with the forest villagers should be reviewed and renegotiated to bring back into forest conservation programme. Along with poor forest dependent communities, new generation of forest villagers can be taken as community patrol groups and given livelihood supports through AIGAs. To be mentioned that alike NSP led CPG members, forest villagers (brought during mid 60's) have turned down their position and to some extent became harmful for resource conservation efforts. Hence it would be recommended to repair the existing problems (villagers) rather than bringing new ones (CPGs) which might be troublesome in future.

Linkage should be developed between service providers (like public and NGOs) and the communities. Among the existing services, education, health care, livelihood skill training, AIGAs and vocational trainings should be ensured for livelihood improvement of the communities.

Regulate fuel wood collection from the PA and large-scale introduction of fuel-efficient stoves in forest neighboring settlements and promotion of biogas plants for institutions like madrassa, police barak, cluster villages etc. provide subsidized price of stove costs and engage conservation entrepreneurs in promotion of such energy efficient stoves.

Organizing stakeholder focused orientation programme for local influential, business communities, saw mill owners, fuel wood collectors, female, and community leaders in importance of PA management and human-PA interdependency for sustainable future and other environmental and climate change issues.

Effective discussion with the timber merchants, saw mill owners, local political influential personalities, law enforcing agencies to comply with forest law; the benefits and services derived from the forest should be highlighted to convince them for the sake of future generation.

Adequate provision for generating scientific and social knowledgebase on the FSW and its landscape should be made. Resource inventory at the onset of the project, as the project progress and even post project scientific studies should be conducted to trace the progress of the management success/failures. Research and education will led the project in a successful completion.

Annex I: PA Gazette

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**Photo gallery: PRA in FWS**



**PRA: Consensus building**



Resource extraction: in unregulated ways



Tobacco curing house: a major threat for forest resources



Settlements in and around the FSW



An unique Ecotone: Mangrove- terrestrial ecosystem



FSW Forests