



Site-Level Field Appraisal for Integrated Protected Area Co-Management Project: Rema-Kalenga Wildlife Sanctuary



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Site-Level Field Appraisal for Integrated Protected Area Co-Management Project (ipac): Rema-Kalenga Wildlife Sanctuary

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ACRONYM

Acronym	Detailed name
AIGA	Alternative Income Generating Activities
ASA	Association for Social Advancement
BDR	Bangladesh Rifles
BO	Beat Office/ Beat Officer
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
BREB	Bangladesh Rural Electrification Board
CBO	Community Based Organization
CDS	Community Development Schools
CMC	Co-Management Committee
CODEC	Community Development Centre
CPG	Community Patrolling Group
Dept.	Department
DFO	Divisional Forest Officer
FD	Forest Department
FGD	Focus Group Discussion
Fig.	Figure
FR	Forest Ranger
FRMP	Forest Resource Management Plan
FSP	Forestry Sector Project
FUG	Forest User Group
GD	Group Discussion
Govt.	Government
HHs	Households
IGA	Income generating Activities
Int.	Interview
IRG	International Resource Group
IPAC	Integrated Protected Area Co-Management Project
kg	Kilogram
KI	Key Informant Interview
LGED	Local Government Engineering Department
Mat.	Material
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
RKRF	Rema-Kalenga Reserve Forest
RKWS	Rema-Kalenga Wildlife Sanctuary
RO	Range Office
RRA	Rapid Rural Appraisal
SH	Stakeholder
TE	Tea Estate
Tk.	Taka
UNO	Upazila Nirbahi Officer
UP	Union Parishad
USAID	United States of Association for International Development
WFC	WorldFish Center
WS	Wildlife Sanctuary

Executive Summary

1. A two-step rapid appraisal process, initial RRA, followed by subsequent PRA, was undertaken to make a comprehensive situational analysis of the Rema-Kalenga Wildlife Sanctuary during March-April, 2009, aiming at helping to shape the future activities for the improved management of the WS within the Integrated Protected Area Co-Management Project. Specifically, the appraisals focused on the assessment of major stakeholders, understanding causes for the forest degradation and its underlying facts, identifying the challenges for the project and exploring the opportunities for its improved management. In addition to application of various RRA and PRA tools, like trend and seasonal analysis, Venn diagramming, livelihood analysis, ranking, scoring, resource mapping etc., a series of household and group interviews, and focus group discussions were also conducted.
2. A total of 67 villages having varying degrees of stake with the WS have been identified, of them three located inside, 9 at the boundary of the WS and 55 are located outside of the WS. Of the identified villages, in and adjacent villages (on the boundary) have major stakes with the WS, as all of its HHs are dependent on the various resources of the forest. Among outside villages, six villages have medium stake, 15 villages have minor-medium stakes and five villages have minor stakes with the WS. The majority of the fuelwood collectors mainly come from Jamburachara, Krishnanagar, Kabilashpur, Himalia, Alinagar, Basulla, Borjum, Kholishabosti, Chonkhola and Khatamara and Harinmara, Jaliabosti, Amirpur, Bhuiyatala and the illegal tree feller mainly come from Alinagar, Basulla, Kabilashpur, Himalia, Harinmara, and Jamburachara, Atikpur, Amirpur, Bhuiyatali and Laturgaon. Of the identified villages, 10 are forest villages and again, 8 of them are tribal villages. Besides, there are about 21 villages outside the Tarap Hill Reserved Forest (6-8 Km away from Rema-Kalenga WS) which have minor to medium stakes.
3. There are two tea estates which have stakes with the RKWS. One of them, Rema Tea Estate, borders with the RKWS and has minor-medium level of stakes with the forest, as some labor from the estate infiltrate the forest for resource collection and also the estate is used as a route for transporting fuel wood and timber. The other estate, Hoogli tea estate, has minor stake, as some laborers and unemployed people are involved with illegal resource extraction from the WS.
4. Based on resource exploitation, a total of 12 primary and 4 secondary SH groups have been identified in the area. Of the primary SH, fuel wood collector has major stakes with the WS, while bamboo and building material collectors and agriculture cultivators have medium level of stakes with the WS and the rest have minor to negligible stakes. Of the secondary SH groups, fuel wood traders have medium and the rest have minor stakes with the WS.
5. Forest villagers exploit most resources from the RKWS, followed by local poor people, other local users and tea garden labor.
6. About 200-250 (in average about 200 people/day) people enter the Rema-Kalenga Reserve Forest for fuel wood collection every day. The collectors are usually male and female, children. In average, 150-200 mounds (37.5 kg = 1 mounds) of fuel wood are removed from the forest each day. However, collection of fuel wood is mainly done during the dry months. According to local people, about 15-20% inside and adjacent HHs collect bamboo from the RKRF.

7. All forest villagers are dependent on the forest for their HH needs for fuel wood and house building materials. Many HHs also depend partially or entirely on the collection of fuel wood, bamboo and other building materials for their livelihood support. They also collect some vegetables, fruits and other NTFPs from the forest for their HH needs. Many HHs, mainly the poor, from the outside villages, entirely or partially dependent on the collection of fuel wood, timber, bamboo collection. Illicit felling from WS is limited as valued timber trees very less available in the WS. Timber felling mainly takes place in the reserved part of Rema-Kalenga Reserved Forest.

8. As per local people perception, the forest cover has decreased by only about 15-20%, compared to pre-liberation period. On the other hand, forest thickness and abundance of tall trees have decreased approx. by 40%. The abundance of herbs and shrubs decreased by about 35-40% and sun-grass by about 80% primarily due to over exploitation of these resources. Indigenous bamboo now remains by 50- 60%. Except birds, the abundance of major wildlife has also decreased by more than 60%. The abundance of medicinal plants has also decreased by about 50-60%. The abundance of fruit bearing trees has decreased by 60%.

9. By now, many wildlife have become extinct from the forest. Among the extinct animals, tiger, sambar (deer), cheetah, gaur (wild cow), tiger, kakatua etc. are notable. Some other wildlife, like small deer (barking deer), bear, fishing cat (meso bagh), wild dog, gibbon, python, wildfowl, cobra, vultures, turtles etc. have also become variously threatened.

10. Compared to pre-liberation period, activities like fuel wood collection have increased by about 80%. On the other hand, collection of bamboo decreased by about 40%, mainly due to decreased stock of bamboo, and honey by about 80% owing to unavailability of the resource. Hunting of wildlife has also decreased by more than 99% mainly due to the activities of NSP and serious decline in the resource.

11. About 15 different types of resource are extracted from Rema-Kalenga WS. Of them, fuel wood and bamboo are collected on a large scale; trees as house building materials are collected at a medium scale, 5 other resource types, including timber, on a minor scale and the rest are collected on a negligible scale. The main purposes for resource extraction are meeting HH needs, selling for added income/and or to support and supplement livelihood. Fuel wood and bamboo collection, collection of house building materials, hunting, timber felling (limited) etc. are posing threats to the forest and has a huge impact on forest regeneration and local biodiversity.

12. Extraction of resources from the forest is season dependant. Fuel wood is mainly collected round the year, but predominantly during dry season due to easy accessibility and mobility inside the forest. Bamboos extraction mainly takes place in drier months that corresponds to local needs for house building and mat making.

13. Major causes for the degradation to forest in order of magnitude are as follows: fuel wood and bamboo collection, collection of house building materials, tree felling, agricultural activities and grazing by livestock etc. The prevailing extreme poverty in the locality, unemployment, coupled with weak law enforcement situation made poor local people to be reliant on the forest resources for meeting HH needs and added income. Scarcity in the availability of these resources in the locality is also the underlying causes for forest use. It is unlikely to prevent the illegal forest extraction activities unless these underlying causal factors are addressed.

14. FD's poor forest patrol, easy negotiation with local FD staff and inadequate manpower of FD is all contributing to illicit felling. Increased fuel wood collection has also been linked to development of transportation system and marketing opportunities.

16. In addition to local consumption at HH level and by local hotel and restaurants, a substantial amount of fuel wood is transported to other urban areas. The main centers for fuel wood trading in the locality are Gazipur Bazar (2-3 traders) , Nalmukh Bazar, Sindhur Khan Bazar (2-3 traders), and Chunarughat (5-6 traders).

17. As revealed by limited HH survey, among the forest villages HHs, about 4-5 % belongs to middle class, 70-80% is poor and 16-20% is extreme poor. Among the outside villages, 2-5% HHs is rich, 10-15% middle class, 60-70% poor and 15-20% is extreme poor. The major primary occupation of the tribal forest villagers is agriculture day labor, day labor in plantations, mat making and agriculture, fuel wood collection. The primary occupation of outside and Bangalee HHs is agriculture (70-75%), principally paddy cultivation, followed by agriculture day labor (15-20%), and bamboo, fuel wood collection and timber felling (5-7%), small business (1-2%), service (1-2%) and overseas employment (1-2%). The secondary occupation of outside villagers is fuel wood collection, bamboo collection and day labor etc.

18. The literacy rate is low in the locality, adult literacy is only about 15-20% and total literacy rate is about 30-35%. Of them, 80-85% people have primary education, 10-15% have studied in the High Schools and 3-5% studied in the colleges and above. However, literacy rates among the ethnic community are lower than the average mentioned above. Among the outside people, about 6-8% people are unemployed, this figure increases manifold during period of Aswin and Kartik also Chaitra and Baisakh. Among the forest villagers the unemployment rate is comparatively higher.

19. The local power structure remains as a crucial issue to the management of the sanctuary. There are about 31 local influential people, who actually have major control over the local people and locality and even over local administration. The local public representatives are very influential and are main sources for local conflict resolution. The tribal people have their traditional way of governance of their community. The headman in each forest village is the most influential person and has a strong command over his community.

20. The major local problems as identified by the local people are poverty, unemployment, education, road communication, availability of safe drinking water, lack of electricity etc.

21. There is a mixed ethnic community, dominated by Tipra, located inside the WS and the reserved part of the forest and have about 167 HHs. They are recognized as forest villagers and have agreement with the FD. They patrol the forest with FD staff and plant about 1200 saplings every year each family at their own cost in the reserved part of the forest. They have skills in mat making and weaving. Many HHs are involved with bamboo mat making and weaving for supporting their livelihood. It has been reported that about 60% of land allocated to them by the FD are leased out to others out of the community on 1-3 years basis. They exploit most types of forest resources require for their HH needs.

22. The major NGOs that operate in the locality are: ASA, BRAC, PASA, BRDB, Grameen Bank, RDRS Bangladesh, Caritash, Nusra, Indever, Usha, BIZ, RKWS Nishorgo Shestha, etc.

Their major activity is credit programs exclusively for the women. Some of them have concentrated on health, education and alternate income generation. There is a Co-Management Council consist of 55 members headed by UNO based on the protected area. They form an executive committee called Co-Management Committee it consist of 19 members headed by elected chairman. The CMC conducted their monthly meeting regularly. They discuss on the present issue related to the bio-diversity conservation. There is only one local community organization called Village Development Program having 64 members, but located outside of the WS. They deal with local problems and welfare and cultural activities. However, they are not much active.

23. Most NGOs and banks provide micro-credit to local people. Bank loans are mainly given for agriculture. NGOs provide credit mainly for IGA. NGO's IGA programs concentrate on small business, poultry, livestock rearing etc. and their activities mainly focused on the women. Skill development activities by the NGOs are limited. The tribal people have skills in weaving and mat making.

24. The main sources of conflict among local people include land disputes, livestock grazing, children affairs, marriage related matters, money lending and transaction, local election and politics, family affairs, etc. Conflicts are resolved by arbitration by local elites & public representatives (UP chairman and members,), local matbar, and headman (in case of ethnic community). If the local efforts are not fruitful it may lead to filing cases with Thana-police, courts. It is to be mentioned that conflicts are very less in case of ethnic community.

25. Major concerns regarding forest biodiversity conservation and management include fuel wood, bamboo and building materials collection, illicit felling, agricultural activities, local power and unemployment, local dependence on the forest resources, weak forest patrol etc. The challenges for the project seem to be curbing/stopping resource extraction, reducing local poverty and unemployment etc.

26. Local people are aware about the RF and WS in Rema-Kalenga. They know about some restrictions on resource collection. People, particularly inside villagers, are worried about the decline in forest resource. Inside people appeared to be very cooperative. The outside villagers showed curiosity about the project. However, the overall response to the NSP and initial response to the IPAC project is good and encouraging.

1. Introduction

1.1 Project Background

⇒ In Bangladesh, natural forests are under constant pressure and have already been significantly degraded and fragmented. In an estimate, forest cover in the country has fallen by more than 50% since 1970. This situation is threatening the value of these forests as habitat for biodiversity and for provision of vital environmental services. If this trend continues, it will soon result in a serious ecological catastrophe and a declining spiral of production and productivity irreversibly detrimental to the livelihood of people living in and around the RKWS, historically dependant on them. Therefore, there is an urgent need to reduce or reverse the detrimental impact on forest biodiversity and maintain resource sustainability through improved management and creating alternate livelihood opportunities for people dependent on forest resources.

⇒ The concern for biodiversity assets in the country has a long history and Bangladesh has a strong commitment to the cause of biodiversity conservation from the national, regional and global perspective as reflected in its endorsement and ratification of many national, regional and international conventions, treaties, protocols etc. related to biodiversity conservation.

⇒ The alarming situation in forest degradation in the country and the governments commitment to national and international community, spurred government effort to designate and establish a number of protected areas, (including National Park, Wildlife Sanctuary and Game Reserve,) with biodiversity significance under the provision of Wildlife Preservation Act, 1973. But there has been a little change in the degrading situation of these PAs with regard to biodiversity and its environmental services. Poor governance and lack of appropriate and pragmatic management regimes for these PAs has been linked to the failure in PA management in the country.

⇒ Responding to the urgent need to address the forest conservation and related economic opportunity creation, the US Government and Government of Bangladesh elaborated and signed a Strategic Objective (SO 6) Grant Agreement to improve management of open water and tropical forest resources. This agreement sets target for improving forest management

⇒ In the context of the agreement, the Forest Department has worked with USAID to jointly develop a project, called Co-management of Tropical Forest Resources of Bangladesh, to accelerate and consolidate protected area management and more active local participation in forest resource management. The Forest Department and USAID recognize the need for the continued effort to manage the forest resources of Bangladesh and has set long-term greater vision with renaming the project as NSP and now Integrated Protected Area Co-Management.

⇒ The Integrated Protected Area Co-Management Project is a continuation of NSP and MACH project. The project is to demonstrate a replicable case for establishing a good governance system that will ensure sustainable management of protected areas of Bangladesh, while working in a number of selected pilot protected areas. Specifically, the project is designed to scale up forest & wetland co-management model, to halt and/or reverse degrading trend in forest and wetland resources and its habitats, reduce unsustainable practices, bring about changes in policy environment in favor of co-management, strengthen stakeholders capacity in natural resource management, improve livelihood of local poor people in order to curb dependency on forest resources.

1.2 Information Needs of IPAC and Logical Basis for Conducting PRA/RRA

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

⇒ It has been emphasized from the beginning that IPAC will avoid information overload, rather it will concentrate on collection of relevant information by using appropriate methodology. Therefore, it was necessary to carefully scrutinize the information needs and determine its relevance to the project objectives and activities.

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

⇒ Co-management -----stakeholders and their activities, socio-economics, behavior, community power structure, their needs and expectations, conflict, challenges etc.

⇒ Resource management ---- resources and its status, trend and causes for resource degradation, resource exploitation, threats to local resources and biodiversity

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

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

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

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

1.3 Purpose of the Report

The main purpose of the present report is to present a synthesis of all findings from RRA and PRA exercises. The report also details the methodology and tools used and highlight the issues and identify the challenges for the IPAC. Finally, the report makes a set of recommendations for the improved management of the WS.

1.4 Outline of the Report

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

⇒ Chapter 3 sets out the methodology of the study that deals with the approach taken for the implementation of the fieldwork of RRA and PRA, study team and study period, objectives and methodology of the study. The chapter also includes study period, setting RRA and PRA issues and questions, formation of RRA and PRA field teams, selection of RRA and PRA spots, choice of RRA and PRA methods and tools and the limitation of the field work. Outcomes of the RRA and PRA exercises are described in chapter 4 which contain major findings and analyses. The findings are mainly presented as situational analysis of the forest resources, stakeholder analysis, resource and resource extraction, trend analysis, socio-economical situation of the surrounding area, seasonal trends in resource extraction, etc. In short, this chapter reflects the current status of the forest dynamics with social dynamics.

⇒ Chapter 5 presents issues and challenges for IPAC, an extended section based on PRA/RRA outcomes, identifying present issues of concern and challenges for IPAC and highlights the opportunities for the project. The final Chapter 6 embodies a set of suggestions and recommendations regarding the implementation of the project. At last a number of necessary references of all documents consulted and photographs are appended as annexure with the report.

2. Description of the Project Site

⇒ The Rema-Kalenga Wildlife Sanctuary is situated in the Gazipur and Ranigaon Unions of Chunarughat Upazila in the district of Habigonj. The forest is under the jurisdiction of Habigonj Range-2 of Sylhet Forest Division and is divided into four forest beats, namely Rema, Chanbari, Rashidpur and Kalenga forest beat. The sanctuary lies in between 24006' - 24014' – N and 91036' – 91039' E. The southeastern boundary of the sanctuary lies along the Indian borders at Tripura State.

⇒ Rema-Kalenga Wildlife Sanctuary is a part of the Taraphill Reserved Forest and was established through a gazette notification in 1982 and further extended by another gazette notification in 1996. The Sanctuary covers a total area of 1795 ha.

⇒ The sanctuary encompasses several hills of different elevations and the low laying valleys. The highest peak of the hills is about 67 m from the sea level. There are a series of ridges on the hills running in different directions, and valleys, locally known as Lunga with flowing water during monsoon but dry up during winter. Three main channels with many tributaries, called Chara, criss-cross the sanctuary.

⇒ The hills of Rema-Kalenga are composed of upper Tertiary rocks with sandstone, siltstones and mudstones. Soils of then sanctuary vary from clay to sandy loam exceedingly fertile and have low pH. In some cases, soil texture consists of yellowish red sandy clay mixed with granules of magniferous iron ore. The sanctuary enjoys a most tropical climate characterized by a period of precipitation from April to September and five months of relatively dry period from November to March. There are also two shallow wetlands, locally called jheels.

⇒ The forest is semi-/and mixed evergreen, where tall trees are deciduous and the under storey evergreen. About 76% of the forest is still in natural condition, plantations only cover about 9% area of the forest. However, the forest has become thin. Paddy is cultivated in some areas in between the valleys, particularly in the northern part of the sanctuary and covers only 5% area of the forest. Secondary information collected on the sanctuary shows that the forest supports about 634 plant species, 7 species of amphibians, 18 species of reptiles, 167 species of birds and 37 species of mammals.

⇒ There is one forest village, inhabited by Tipra tribe, located within the sanctuary. However, there are other forest villages which stand at the boundary between the reserved forest and the wildlife sanctuary. Most of those are inhabited by tribal community. Adjacent land use cover includes long-rotational reserved forest, tea estate, converted agricultural lands and khas land.

⇒ Human pressure on the sanctuary is in fact buffered by the adjacent reserved part of the forest. However, fuel wood collection and collection of building materials by the inside and adjacent HHs pose a threat to the biodiversity. Land encroachment in the past and still remains as a source of conflict with the FD. Illicit tree felling, agricultural activities, livestock grazing are also causing threats to the sanctuary.

⇒ Clear felling, FD's plantation strategies, over exploitation of many forest resources was posing threats to the forest environment and its biodiversity. Forest Department tries to mitigate the environmental degradation and loss of biodiversity in the reserve forest under the Nishorgo Support Project.

Map of Rema-Kelenga Wildlife Sanctuary



Settlements in and around the WS

(not to Scale)

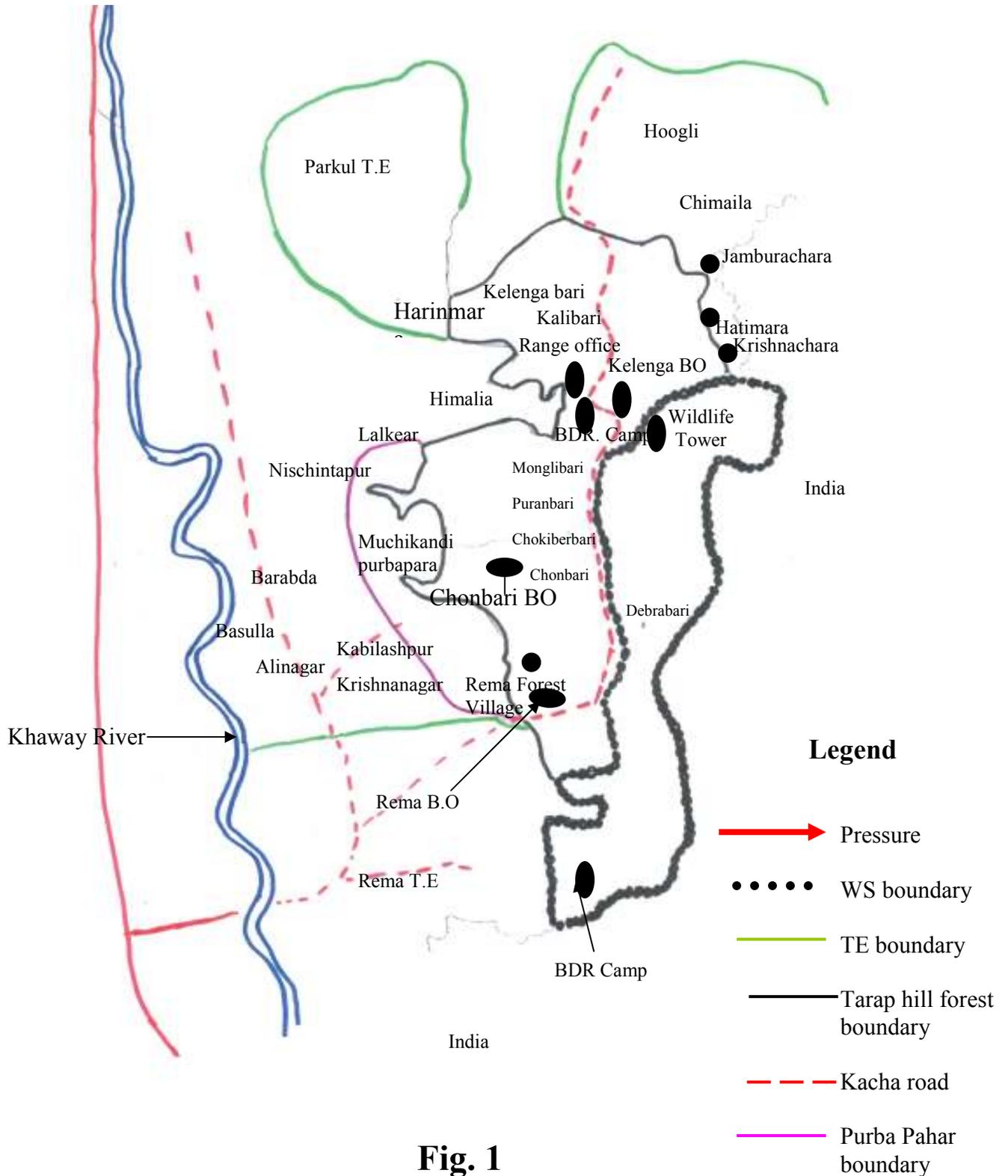


Fig. 1

3. Methodology

⇒ As mentioned in the preceding section 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 the RKWS with a view to understand: -

- ➔ Who destroys and how the forest is destroyed
- ➔ What are the underlying driving forces for the forest degradation?
- ➔ Cause and effects of the behavior of local people
- ➔ Opportunities for improvement in forest management

3.1 Developing the RRA and PRA: Issues and Methods

⇒ An inception workshop was organized on 24th February 2009 at Srimangal for IPAC North-East Cluster to identify, prioritize and finalize the RRA/PRA issues and questions. The type and nature of issues, the research team's accessibility and mobility in the area, the behavior of local people and their rapport with the field staff were all taken into consideration in the design of these methods and tools. The workshop was attended by specialists and representatives from WorldFish Center, field implementation partners (RDRS) and local FD staff, who were likely to be involved in the RRA field exercise. This workshop provided an opportunity to prepare a field protocol, decide and agree on approaches, methods and tools to be used and also to make and consolidate team understanding.

⇒ The detailed methodology for these activities was embodied in a manual and used in training workshops with the field teams to give instruction in using the research tools and to ensure that the methodology remained same across the team and across the sites. An experience sharing meeting was organized for the RRA & PRA team members on 23rd March 2009. The purpose was to give the RRA and PRA field team instructions in using various tools.

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

Table 1. Selected RRA Issues for Rema-Kelenga WS, Specific Activities and Tools Used

Sl.	RRA Issues	Specific activities	Tools Used	Participants
1	Stakeholder Assessment	<ul style="list-style-type: none"> ▶ Identification of settlements, resource users, local institutions and agencies and organization, community organizations etc and their roles and activities 	HHs Interview, KI, FGD, GD, Sketch mapping	Local HHs Local school teacher, Doctor Community people (villagers, elites etc) Local community people Local people
2	SH Demographic profile	<ul style="list-style-type: none"> ▶ Settlement wise no. of HHs/population ▶ HH occupation, education, forest use, land holding 	Secondary Info HH Int., KI, GD, FGD Trend Analysis	Local union parishad HHs heads/members Community people School/College teachers & local public representatives
3	SH Economic Activities/ Livelihood Strategies and Human Capital Development	<ul style="list-style-type: none"> ▶ HH primary and secondary income sources of HH ▶ Richness/poverty ▶ Unemployment and its seasonal trend ▶ Credit and alternate income generating opportunities ▶ Skill and skill development opportunities ▶ Seasonal workload of male and female 	HH Int. GD KI FGD Seasonal Calendar	HHs heads/members Teacher, retired officers, old people Public representative Local elite Community people Forest villagers
4	Gender Issues	<ul style="list-style-type: none"> ▶ General impression on living standard, education and health status etc. ▶ Participation in decision making (household and PA management) ▶ Women mobility in the area ▶ Access to IGA and credit etc 	HH Int. GD FGD KI, Direct Observation	HHs heads Women group Community people Local elites RRA team members.
5	Behavior of local people	<ul style="list-style-type: none"> ▶ Initial response of the local people and FD staff towards the project ▶ Sources of conflict and conflict resolution 	FGD GD HH int.	Local community FD staff HHs heads
6	Local Level Awareness	<ul style="list-style-type: none"> ▶ Awareness and perceptions about resource degradation and conservation ▶ Willingness for resource conservation 	HH int. GD FGD	HHs heads Local community FD staff

		<ul style="list-style-type: none"> ▶ Awareness about the existence of nearby park/game reserve and reserved forest ▶ Knowledge about forest and wildlife preservation acts 		
7	Resources /resource status	<ul style="list-style-type: none"> ▶ Trend in changes in major resource bases ▶ Endangered/extinct plant and animals ▶ Causes for the decline in different resources 	Trend analysis, HH int, FGD, GD, KI	Local people/FD staff Local HHs heads FD staff Community people Local educated old,
8	Resource exploitation	<ul style="list-style-type: none"> ▶ Major forest resources collected, including NTFPs: ▶ Reasons and extent of exploitation of different forest resources ▶ Dependency on the forest/forest products ▶ Seasonal trend in resource exploitation ▶ Future risks ▶ Medicinal plant uses and reason for not using these 	HH int, FGD, GD, KI, Trend analysis, seasonal calendar	Local HHs heads Public representatives & FD staff Community people Local educated old, Local elite and FD staff HHs interview and KI
9	Resource regeneration practices	<ul style="list-style-type: none"> ▶ Plantation status in the locality ▶ Problem with natural regeneration in the forest ▶ Plant nursery ▶ General land use pattern in the buffer zone ▶ Major agricultural crop ▶ Seasonal pattern in agriculture 	Secondary Information, FGD, GD, KI, Seasonal calendar	Secondary data from FD FD staff Community people Local elite, teacher Community people
10	Legal aspects	<ul style="list-style-type: none"> ▶ Access to the forest by locals ▶ Forest villagers and land use agreement ▶ Conflict and negotiation with FD staff ▶ Land encroachment/recovery ▶ Law enforcement mechanisms in the PA ▶ Illegal tree felling and forest cases 	FGD, GD, KI, FGD, KI	FD staff and forest villagers Local community and local govt. members Local elites FD staff, community people Teacher, ex-officers,
11	Power structure	<ul style="list-style-type: none"> ▶ Local influential and their role, local hierarchy ▶ Nature and sources of power and their domain of influence ▶ Conflict and conflict resolution 	HH int, FGD, GD,	Local HHs heads Local community and local govt. Local community

		▶ Social cohesion and adhesion	KI	Local elites
12	Others	▶ Access to areas and settlements ▶ NGO activities in the locality ▶ Challenges for conservation ▶ Local problems ▶ Mobility in the area	HH int, FGD, GD, KI	HHs heads Local community and local govt. Local people & FD staff Local elites

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

Table 2. PRA Issues, Specific Activities Performed and Tools Used In Rema-Kelenga WS

Sl.	Issues	Specific activities	Tools used	Participants
1	Forest make up dynamics	▶ observation on forest physiography and topography and forest make up ▶ land use cover, resource exploitation and regeneration areas, animal distribution ▶ changes in forest cover, thickness, vegetation, settlements, animals and availability of resources	Transect walk KI Resource mapping Secondary data, FGD, KI Trend analysis	PRA Team Local elite, FD staff FD staff and village headman, forest villagers. Local people and FD staff, forest villagers
2	Local governance system and community structure and functions	▶ Decision makers--- influential people ▶ Local community organizations and institutions and their linkages ▶ Local conflict and conflict resolution ▶ Social cohesion and adhesion ▶ Collective action ▶ Local problem, cause and possible solution	Venn diagram Venn diagram Venn diagram FGD/GD FGD & GD and Ranking	Community people Community As above As above and local elite
3	Livelihood strategies	▶ Income and expenditure sources, Livestock, Richness and poverty	Wealth ranking HH interview	Women group and local people
4	Gender issue	▶ Family decision making ▶ mobility	Decision making Chart	Women group Women group

		<p>marketing</p> <ul style="list-style-type: none"> ▶ conflict and negotiation with FD or other people over the extraction ▶ alternate source for the collection of the resources ▶ needs and expectation of the collector ▶ impact on the forest and future risk for the collector 		representative and elite
8	Bamboo and cane collection	<ul style="list-style-type: none"> ▶ Information on collector ▶ purpose and reasons for collection ▶ uses of the resource and extent of extraction ▶ dependence on the extraction and marketing ▶ conflict and negotiation with FD or other people over the extraction ▶ alternate source for the resources ▶ needs and expectation of the collector ▶ impact on the forest and future risk for the ▶ seasonal changes and trend in abundance 	<p>FGD, GD</p> <p>Seasonal calendar and trend analysis</p>	<p>Bamboo and cane collector, community, people and FD staff</p> <p>Bamboo collector and local people</p>
9	Information on Forest villagers & Ethnic Community	<ul style="list-style-type: none"> ▶ Distribution of forest villager's & ethnic communities settlements ▶ Registered and actual number of forest villagers ▶ Compliances to FD agreement ▶ Present economic activities ▶ Resources exploitation and dependence on forest resources ▶ land encroachment by the forest villagers or by their dependant ▶ relationship and conflict with FD ▶ internal governance system ▶ needs and expectation 	<p>FGD</p> <p>Secondary data</p>	<p>Forest villagers, Ethnic Community and FD staff</p> <p>FDs villagers register</p>
10	Lemon cultivation	<ul style="list-style-type: none"> ▶ distribution of Lemon yards within and approximation of its number ▶ historical perspective of flourishing the activity in the area ▶ information on cultivator ▶ ownership of land ▶ dependence on the activity ▶ Impact on the forest resources ▶ Conflict with FD 	<p>FGD</p> <p>GD</p> <p>GD</p>	<p>Lemon cultivator</p> <p>FD staff</p> <p>Local community</p>

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

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

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

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

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

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

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

3.2 Fieldwork Preparation

3.2.1. Selection of RRA and PRA Sites

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

Table 3 List of Selected RRA Spots & Schedule for Visiting in RKWS site

Date	Village/ Location	Performed activities	Remarks
22/03/09	At IPAC Office Srimangal	Experience Sharing Session	Experience sharing session on RRA & PRA field exercise at IPAC Office Srimangal
02/04/09	At RKWS site office	Orientation Training	Day long orientation training to the local enumerator on RRA & PRA activities
04/04/09	Borjucee Bazar	GD(2) HH interview (3) Social Mapping	GD, HH interview & social mapping with local community people
	Himalia	KI interview (1)	KI with local elite
	Taltala	GD (1) HH interview (3)	GD & HH interview with local community people
	Kalenga	KI interview (1)	KI with forest village head man
05/04/09	Chanbari Beat	FGD (1)	FGD with Forest Villagers
06/04/09	Reserve Tila	GD (1) HH interview (3)	GD & HH interview with community People
07/04/09	Bholarjum	GD (1) HH interview (2)	GD with community people & HH inter view with female participants.
	Basullah	KI (1) HH interview(1)	HH & KI inter view with community people
	Nalmukhbazar	GD(1) HH interview(1) Social Mapping	GD with community people and HH interview & social mapping with CMC member
	Barowapda	KI (1) HH interview(1)	HH & KI inter view with community people

Table 4 List of Selected PRA Spots & Schedule for Visiting in RKWS site

Date	Village/ Location	Performed activities	Remarks
22/03/09	At IPAC Office Srimangal	Experience Sharing Session	Experience sharing session on RRA & PRA field exercise at IPAC Office Srimangal
02/04/09	At RKWS site office	Orientation Training	Day long orientation training to the local enumerator on RRA & PRA activities
05/04/09	Kalenga	GD (1) HH interview (2) Social Mapping	GD & HH interview with local community and Social Mapping with KI
	Chanbari Beat	GD (1) HH interview (1)	GD & HH interview with local people
	Mongoliabari	GD (1) KI (1) HH interview (3) Social Mapping	GD with local community & HH inter view with female participants. KI with local elite, Social Mapping with community people
06/04/09	Jamburachara	GD (1) KI (1) Social Mapping	KI & Social Mapping with local UP member, GD with community people
	Huglia	GD (1) HH interview (2)	GD and HH interview with Local People
08/04/09	Basullah	GD (1) HH interview (2) Social Mapping	GD with community people and HH interview & Social Mapping with CPG & CMC member

Date	Village/ Location	Performed activities	Remarks
	Alinagar	KI (1) HH interview (2)	HH interview and KI with community people
	Rema Beat	KI (1)	KI with Rema Beat officer
09/04/09	Gatabala	GD (1) HH interview (2)	GD & HH interview with community people
	Ranigaon	GD (1) HH interview (1)	GD & HH interview with community people
	Parkul Tea Estate	GD (1) HH interview (1) Social Mapping	GD, HH interview & Social Mapping with tea garden labour
13/04/09	Kalenga Beat	FGD(1) Forest resource mapping, Transect work	FGD with forest staff, Forest resource mapping, Transect work with forest villagers and FD Staff

3.2.2 Formation of RRA and PRA Field Teams

The RRA & PRA field teams were formed with representatives from RDRS Bangladesh, World Fish Centre and local enumerator having biological and sociological background. The teams make up for the RRA and PRA field exercises are provided in the table 4 and table 5, each team consisting of 3 members. The teams worked simultaneously in the field, but at different locations.

Table 5. RRA & PRA Central Team for all sites

Central Team for all sites		
Name	Organization	Duties
Mr. A.S.M. Sharif	RDRS Bangladesh	Central Team Leader: Coordinating all teams
Mr. Raihanul Islam Chowdhury	RDRS Bangladesh	Logistic Support Coordinator: Coordinate by Providing all kinds of logistic support
Mr. Tapash Kumer Roy	WorldFish Center	Technical Coordinator: Provide all technical support & report review
Mrs. Shaila Shultana	RDRS Bangladesh	Team Member
Mr. Parvez Kamal Pasha	RDRS Bangladesh	Team Member

Table 6. RRA & PRA Local Team for Rema-Kalenga WS site

Team 1 for Ranigaon, Mirashi and Shindurkhan Union		Team 2 for Gajipur Union	
Name	Duties/ Organization	Name	Duties/ Organization
Md. Azizur Rahman	Local Team Leader, RDRS	Md. Azizur Rahman	Team Leader, RDRS

Mr. Bebakananda Bishwas	Team Member, RDRS	Mr. Bebakananda Bishwas	Team member, RDRS
Mr. Partho Sharoti Bhattacharj	Local Enumerator	Mr. Monirul Islam	Local Enumerator
Md. Azizur Rahman	Report Writing,		

The RRA & PRA field exercise was conducted during 2nd to 13th April 2009. The detailed time schedule for the field activities are provided in Tables 3 and 4 respectively.

3.3 Field Implementation Strategies

3.3.1. Organization of the RRA and PRA field work

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

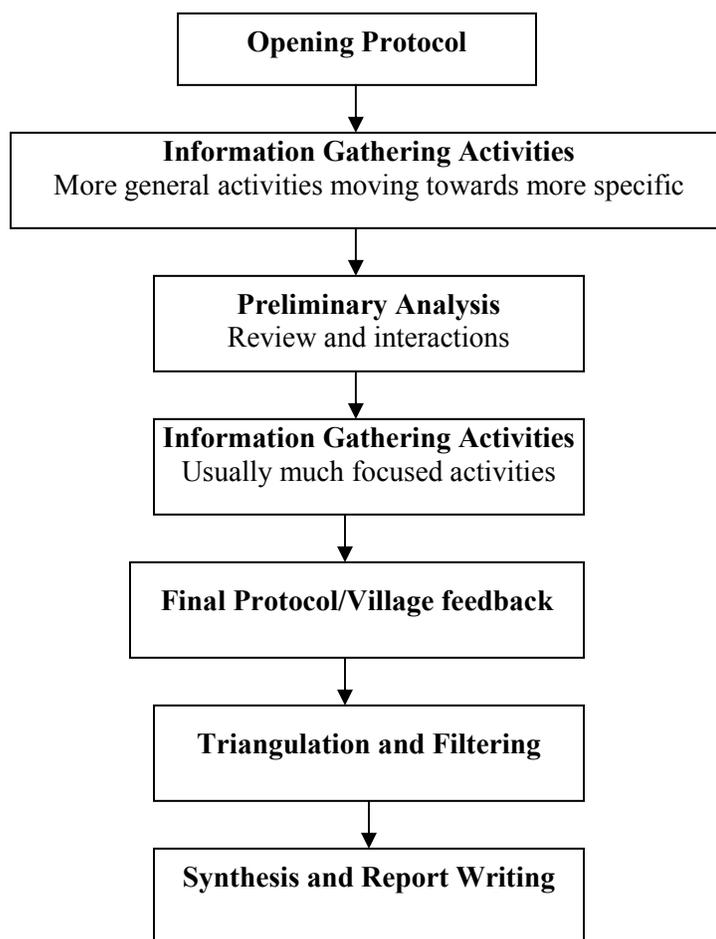


Fig. 2 Flow of RRA/PRA Field Activities (3-4 days)

⇒ During RRA exercise, a total of 13 HHs interviews, 6 group interviews, 4 key informant interviews 2 social mapping and 1 Focus group discussions (one with forest villagers of Chanbari forest village) were conducted. The other RRA tools were applied during above mentioned interviews and discussions. Similarly, during PRA a total of HH 16 interviews, 9 Group interviews, 6 resource & social mapping and 1 focus group discussions, 4 key informant interviews were conducted. This is summarized in Table-5.

Table 5: Summary of Performed Activities in RKWS site during PRA & RRA at a Glance.

Appraisal	Village/ Settlement covered	FGD	GD	KI Interview	HH Interview	Transect	Resource and Social mapping
RRA	6	1	6	4	13	-	2
PRA	9	1	9	4	16	1	6

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

3.3.2 Household (HH) interview

⇒ Individual/HH interviews were conducted with randomly selected interviewees, typically visiting one household at each stop.

⇒ Both male and female respondents were considered.

⇒ Typical HH interview last for about 1 hr – 1:30 hr

⇒ The interviewees were not treated as respondents to a questionnaire, but active participants in an unstructured/semi-structured interview. A checklist of issues was used as a basis for questions, not necessarily addressing all questions in each interview and sometimes departing from basic questions to pursue interesting, unexpected or new information, relevant to the project and situation.

3.3.3 Key informant (KI) interview

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

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

⇒ A preliminary discussion with local FD staff and interview of local people gave adequate clue for selecting KI. Preferably local schoolteachers, retired officials, local elites or local public representatives would be selected as the KI.

⇒ A typical KI interview lasted for about 1.5 hrs. The entire team took part in the interview taking session

⇒ As with HH interview, a similar checklist of questions was used for the purpose of KI interview.

3.3.4 Group interview

- ⇒ The purpose of the planned Group Interviews was to collect some information on the locality and local situation based on the consensus of the local people.
- ⇒ Interviews were conducted at places, preferably at local tea stalls, road junctions and other local community places, where local people gathered spontaneously. Formal invitation to the local people was made for participating at the group interview.
- ⇒ Mapping, seasonalities ranking and scoring exercises, whenever possible, were done in such group interviews.
- ⇒ Typically a group interview lasted for about 1-1.5 hrs
- ⇒ At least one group interview was held each day
- ⇒ This was basically an unstructured interview and a checklist of issues was used as a basis for questions

3.3.5 Focus Group Discussion

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

- ⇒ During PRA, FGDs were principally conducted with different stakeholder groups, mainly with local FD staff, forest villagers, local public representatives etc. other professional groups, like fuel wood collector, sawmill owner, etc.
- ⇒ The FGDs were conducted by invitation and a local guide was used to invite the people.
- ⇒ Senior project personnel /or senior personnel from the partner NGO /and or senior FD Official and/or experts were usually present in the FGD sessions.

3.3.6 Other PRA tools

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

3.3.7 Direct Observation

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

3.3.8 Secondary Information Collection

Some demographic data was collected from the relevant local Union Parishad & Upazila Statistics Office sources. The report on secondary information collection on the RF prepared under NSP was also consulted, whenever necessary.

3.3.9. Reflection and Analysis

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

- ⇒ Reviewed information gathered that day and made summary of the information, triangulated whenever necessary. The person designated for report writing took note of discussions
- ⇒ Planned the next day's activities
- ⇒ Methodological review

3.3.10 Triangulation and filtering

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

3.4 Limitations of the Fieldwork

- ⇒ The main limitation of the field work was that it took place during the summer season. At the mid day it was hot & shiny day so the working conditions more or less difficult mainly in group discussion.
- ⇒ One problem was particularly noticed in discussions with stakeholders in the tea garden adjacent to the RKWS site, they was busy their daily activities so they could not agree to provide us time for group discussion.
- ⇒ On the other hand in the tea garden, most of the respondent was employee of the garden and did not feel comfortable in responding to the queries regarding their stake and resource collection from the RF.
- ⇒ Some times the respondent hoped to receive some incentives (AIGs) from IPAC project like NSP so they very much interested to gather their own FUG member.
- ⇒ The difficulty of access and the time required to travel to the actual sites, meant that time actually collecting data was often limited to 6 or 7 hours a day. These difficult conditions also meant that accessing the forests to undertake transect walks, was also frequently impossible due to bad weather and impassable tracks.
- ⇒ Another limitation was that local people are not aware about the demarcation between the reserved part of the forest and the wildlife sanctuary, as these two make a single ecosystem. People could not distinguish between the resources and resource protected areas. As such the researchers had to use their own judgment at arriving at many decisions. Sometimes, overlap in information was detected later and could not be segregated.

4. Outcomes

4.1 Status and Trend in the Forest

The RKWS has an area of about 1795 ha and most parts of which still support the natural vegetation. Some small areas are, however, covered by long rotational plantations, bordering with the reserved part of the forest, while agriculture occupies some areas, particularly in the northern part of the WS. However, as can be seen from Fig. 3, the high forest is located in a number of small places. Most vegetation covers are represented by high-low scattered forest, followed by low thick forest and low scattered forest.

Secondary data collected on the forest show that there are about 7 species of amphibians, 18 species of reptiles, 167 species of birds, 37 species of mammals in the WS (www.nishorgo.org). Floral composition is highly diverse representing about 634 species of plants. The dominant trees are Teak/Shegun (*Tectona grandis*), Kakra (*Aporosa dioica*), Pitraj (*Aphanamixis polystachya*), Jarul (*Lagersotroemia Speciosa*), Mandar (*Erythrina variegata var. orientalis*), Olive (*Elaeocarpus robustus*), Shidha Jarul/ Mini Jarul (*Lagersotroemia parviflora*), Kanthal (*Artocarpus heterophyllus*), Bon Supari (*Caryota urens*), Neem (*Azadirachasta indica*), Champa (*Michelia champaca*), Chikrashi (*Chikrassia tabularis*), Chalta/ Elephant Apple (*Dillenia indica*), Koroï (*Albizia procera*), Chatim (*Alstonia scholaris*), naur (*Burserra serrata*), hargaza (*Acanthus illiicifolius*), hortoki (*Termanalia chebula*), bahera (*Termanalia belerica*), Jam (*Syzygium grandis*), Awal (*Vitex penduncularis*), Dewa/Bhorta (*Artocarpus lecuha*), Nageswar (*Mesua feria*), Sundhi (*Michelia oblonga*), Bohera (*Terminalia belerica*), Gamar (*Gmelina arborea*), Puti jam (*Syzygium cumini*), Jog-dumur (*Ficus racemosa*), Kaimula (*Engalhardtia apicata*), Kak-dumur (*Ficus hispida*), Kanchan (*Bauhinia acuminata*), amloki (*Embelica officinalis*), kanthal (*Artocarpus terbinatus*), kaw (*Garcinia cowa*), Kadam (*Anthocephalus chinensis*), chapalish (*Artocarpus Chaplasha*), arjun (*Terminalia arjuna*), Jali bet (*Calamus guruba*), Bara bet (*Calamus viminalis*) etc. The major wildlife are squirrel, wild boar, barking deer, fishing cat, jungle fowl, jungle cat, wild dog, hill moyna, hoolock gibbon, honuman, porcupine, parrot, bear, etc. As can be seen from Fig. 4 that the major wildlife species are concentrated along the Indian borders.

Table 8 shows the changes in forest make up, forest resources and resource extraction related activities. According to local people perception, there has been a little changes in forest cover. Compared to pre-liberation period the cover decreased only by 15-20%. However, the forest thickness and abundance of tall trees decreased by about 40%. Undergrowth herbs and shrubs have also decreased by about 35 –40%. Except bird, wildlife has decreased by about more than 60%. Bamboo has reduced by about 50-60%. Medicinal plants have decreased by about 60%.

Many wildlife have become extinct locally by now, including kakatua, tiger, titir, goyal, samba deer etc. from the forest. Similarly, a number of species have become variously threatened locally and notable of them are barking deer, bear, fishing cat, wild dog, gibbon, python, wild fowl, porcupine, cobra, vultures, turtle etc.

Compared to pre-liberation period, activities like fuel wood collection have increased by 80%. On the other hand, bamboo collection decreased by about 40% due to decline in bamboo stock. Agricultural activities have also flourished by about 50-60%. Hunting of wildlife and honey collection has decreased by more than 80% due to serious decline in the resources.

Rema-Kelenga Wildlife Sanctuary

Land use Cover Map

(not to Scale)

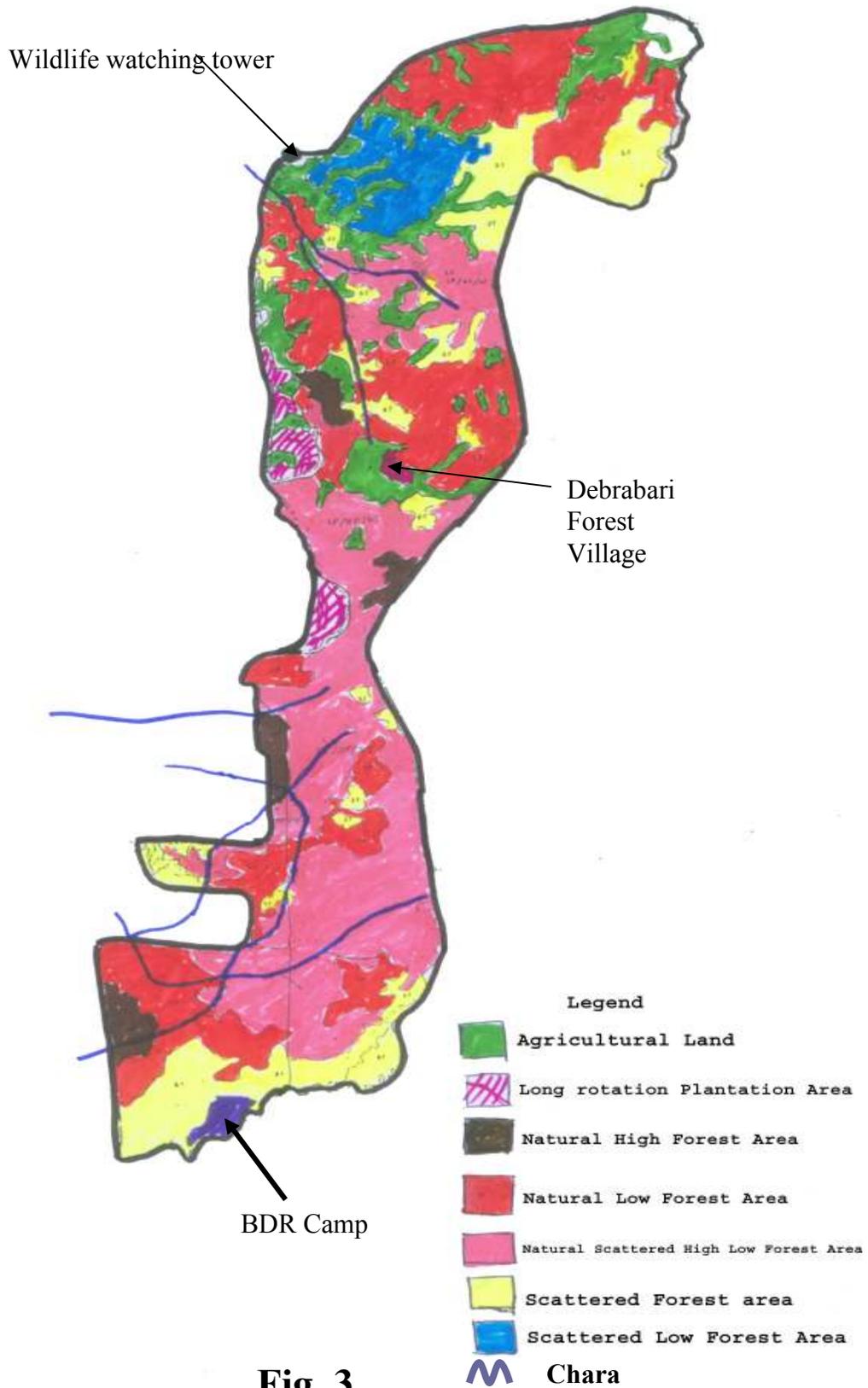


Fig. 3

Rema-Kelenga Wildlife Sanetuary

Spatial Distribution of Major Wildlife

(not to Scale)

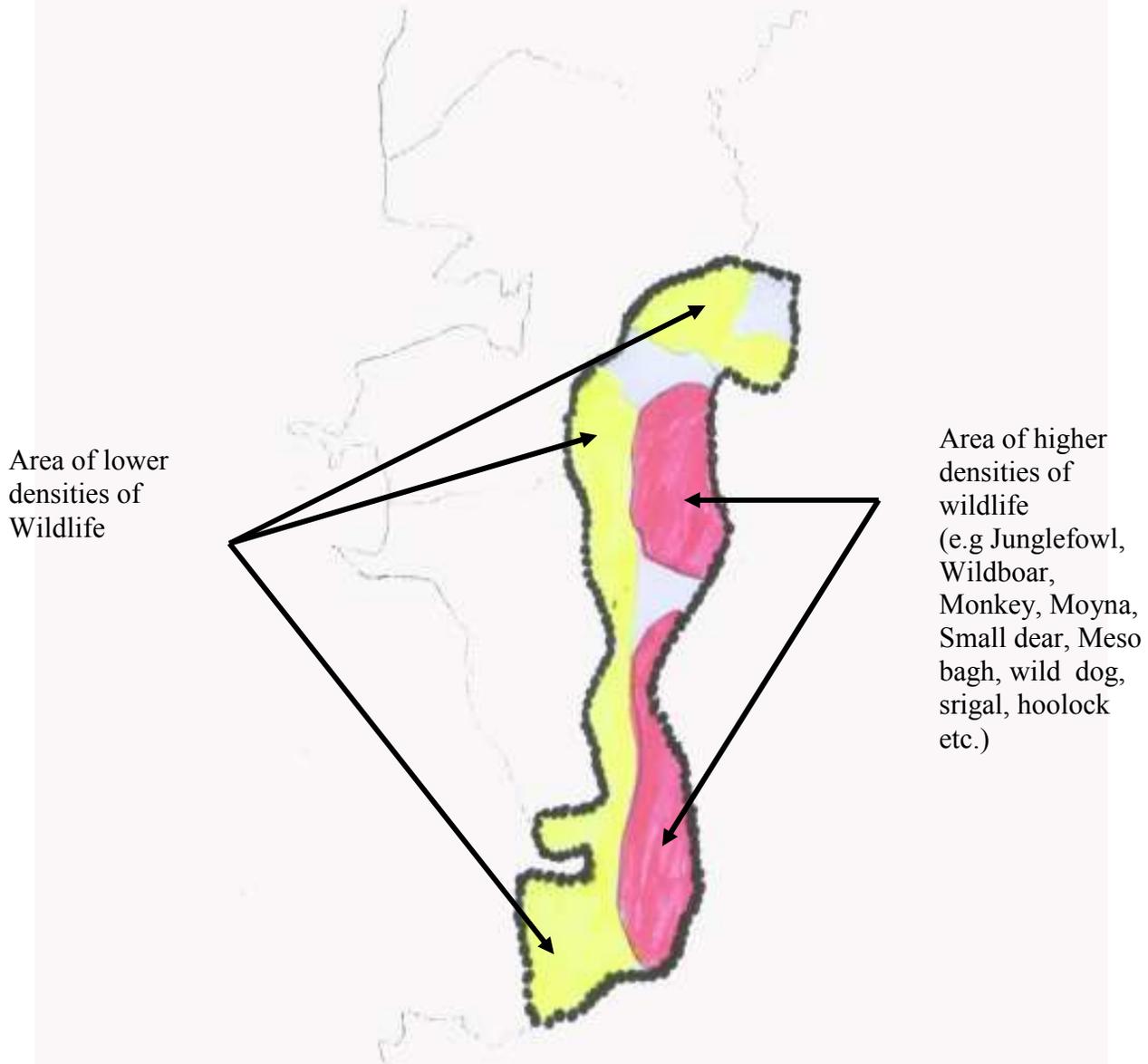


Fig -4

Table 8. Status and Trend in Changes in Resources in Rema –Kalenga WS

Issue	Pre-1971	15 years ago	Present	Cause of changes	Future Risk
Forest Cover	00000	0000	0000	Small scale illegal felling, over exploitation of fuel wood, bamboo, building and agricultural practice etc	Medium
Forest Thickness	00000	000	000	Over exploitation of fuel wood, bamboo, building materials, small scale illegal felling,	High
Tall trees	00000	0000	000	Illegal tree felling, natural mortality etc.	High
Undergrowth trees	00000	0000	000	Illegal felling, over exploitation of fuel wood bamboo and building materials etc.	High
Herbs and Shrubs	00000	0000	000	Excessive collection of fuel wood, bamboo and building materials.	Medium
Wildlife	00000	000	00	Habitat loss, food scarcity, lack of safety, hunting in the past, disturbances by resource collectors	Very high
Hunting and Trapping	00000	00	0	Prohibition, and unavailability of game animals and birds	Minor
Fuel wood collection	0	000	00000	Traditional practice of local people for HHs consumption, local poverty, unemployment, easy access.	High
Bamboo and cane	00000	0000	000	Bamboo and cane stock decreased due to over exploitation for HHs consumption and sale.	High
Fruit bearing trees in the wild	00000	000	00	Natural mortality, few illegal felling, absence of fruit trees plantation for regeneration in WS area.	Medium
Medicinal plants	00000	000	00	Habitat destruction, over exploitation of fuel wood collection, grazing.	Medium
Livestock	00	000	0000	Live stock increase for alternative income	Minor
Agricultural activities	00	000	0000	Cultivation of various agricultural species to recover food scarcity, new variety cultivation.	Minor
Sun grass	0000	000	0	Over exploitation, claiming land sunglass bed,	Medium
Vegetables	0000	000	00	Habitat destruction, over exploitation, grazing.	Minor
Fodder	00000	000	00	As above	Medium
Honey	0000	00	0	Decreasing of fruit bearing trees, habitation destruction of natural forest area.	High

4. 2 Settlements In and Around RKWS and Its Level of Stakes with the WS

4.2.1 Villages

A total of 46 villages having varied degree of stakes with the WS have been identified. Fig. 5 shows the location of the identified villages in and around the WS. The villages belong to 4 Unions of Chunarughat and Srimongal Upazila. In RKWS, only one village (namely Debrabari of Tribal community) is located inside the WS and another 9 forest villages at the boundary of the WS and the reserved forest and the rest are located outside of the WS. The outside villages are in the range of 2-5 km as the WS is immediately bordered by Tarap Hill Reserve Forest is in west and northern side of the WS. Table 9 provides information on the inside and adjacent villages HH number, its location and level of stakes with WS.

Identified inside and adjacent villages (on the boundary) have major stakes with the WS, as all of its HHs is dependent on the various resources of the forest. Among outside villages, six villages have medium stake (namely Jamburachara, Harinmara, Jalia bosti, Amirpur, Bhuiyatali and Laturgaon), 15 villages have minor-medium stakes (namely, Atikpur, Kalikapur, Borjush, Jibdorchara, Himalia, Amtala, Alinagar, Basulla, Kabilashpur, Gazinagar, Cheganagar Borjum, Kholishabosti, Chonkhola and Khatamara) and five villages (Nishchintyapur, Lalkear, Barabda, Chamaltoli, Krishnanagar) have minor stakes with the WS (Table10). The majority of the fuelwood collectors mainly come from Jamburachara, Krishnanagar, Kabilashpur, Alinagar, Basulla, Himalia and Harinmara, Jaliabosti, Amirpur, Bhuiyatata and the illegal feller mainly come from Alinagar, Basulla, Kabilashpur, Himalia, Harinmara, and Jamburachara, Atikpur, Amirpur, Bhuiyatali and Laturgaon.

Besides, there are about 21 villages outside the Tarap Hill Reserved Forest (5-8 Km away from Rema-Kalenga WS) which have minor to medium stakes with the reserved forest as some of for fuel wood and illegal timber felling (Table 11).

Fig. 5 shows the human pressure on the different areas of the WS that arise from various settlements. All HHs of the inside and adjacent settlements mostly depend on the WS for their every day HH needs of fuel wood, building materials, vegetables, and others, while some of them carry out these activities for added income. Some unemployed and poor people from the adjacent tea estate also infiltrate the WS, mainly for collection of fuel wood and house building materials. Some of them are, however, involved with illegal felling.

Table 9. Information on Inside and Adjacent Villages Having Stakes with RKWS

Sl. No.	Name of village	HH Nos.	Location	Union, Thana	Level of stake	Type of stakes
1	Kelenga bari (Forest village)	152	Adjacent to boundary of WS (Bangalee)	Ranigaon, Chunarughat	Major	Mainly involved with paddy cultivation and collect fuel wood, house build. mat., vegetables and other NTFPs,
2	Kalibari	09	Adjacent to boundary of WS (Tribal)	Ranigaon, chunarughat	Major	Same as above

3	Mongolia bari	41	Adjacent to boundary of WS (Tribal)	Ranigaon, chunarughat	Major stake WS	Mainly involved with paddy cultivation, bamboo collection, fuel wood and house build. mat. collection etc
4	Puranbari	08	Adjacent to boundary of WS (Tribal)	Ranigaon chunarughat	Major stake WS	As above
5	Chakidarbari	24	Adjacent to boundary of WS ((bangalee)	Ranigaon chunarughat	Major stake WS	As above
6	Chanbari	33	Adjacent to boundary of WS (Tribal)	Ranigaon chunarughat	Major stake WS	Mainly involved with agriculture practice in forest, some involved with bamboo collection for chatai making and selling for their livelihood
7	Debrabari	19	Inside (Tribal)	Ranigaon chunarughat	Major stake WS	Mainly involved with agriculture practice in WS, fuel wood collection, bamboo collection for handicrafts making etc.
8	Rema forest village (Balumara)	26	Nearer to boundary of WS (Tribal)	Gazipur chunarughat	Major stake WS	Mainly involved with agriculture practice in the forest, and fuel wood collection both livelihood and HHs use, building materials collection
9	Hatimara	14	Adjacent to boundary of WS (Tribal)	Sindurkhan, srimongal	Major stake WS	Mainly involved with fuel wood collection from WS and few with agriculture practice.
10	Krishnachara	42	Adjacent to boundary of WS (Tribal)	Sindurkhan, srimongal	Major stake WS	Same as above
11	Reserve Tila	09	Inside (Tribal)	Ranigaon, chunarughat	Major stake WS	Same as above
12	Taltala Shibir	103	Inside (Bangalee)	Ranigaon, chunarughat	Major stake WS	Same as above

Table 10. Information on Outside Villages Having Stakes with RKWS

Sl. No.	Name of village	HH Nos.	Location	Union, Thana	Level of stake	Type of stakes
1	Harinmara	213	Outside of WS, inside of RF	Ranigaon, Chunarughat	Medium	Mainly involved with fuel wood and other resource collection
2	Atikpur	139	Outside	Ranigaon, Chunarughat	Minor to medium	Same as above
3	Kalikapur	220	Outside	Ranigaon,	Minor	Same as above

				Chunarughat	to medium	
4	Borjush	563	Outside	Ranigaon, Chunarughat	Minor to medium	Same as above
5	Jibdorchara	43	Outside	Ranigaon, Chunarughat	Minor to medium	Same as above
6	Parkul TE	218	Outside	Ranigaon, Chunarughat	Minor to medium	Mainly involved with fuel wood collection and some with illegal felling
7	Parkul	448	Outside	Ranigaon, Chunarughat	Minor to medium	Mainly involved with fuel wood collection and some with illegal felling
8	Jamburachara	500	Near to WS	Ranigaon, Chunarughat	Medium	Mainly involved with fuel wood collection and some with illegal felling
9	Himalia	144	Outside	Mirashi, Chunarughat	Minor-Medium	Involved with fuelwood collection and illegal felling
10	Amtala	311	Outside	Mirashi, Chunarughat	Minor-Medium	Same as above
11	Jalia Bosti	28	Outside	Mirashi, Chunarughat	Medium	Same as above
12	Amirpur	90	Outside	Mirashi, Chunarughat	Medium	Same as above
13	Bhuyatali	127	Outside	Mirashi, Chunarughat	Medium	Same as above
14	Laturgaon	191	Outside	Mirashi, Chunarughat	Medium	Same as above
15	Nichintapur	116	Outside	Mirashi, Chunarughat	Minor	Same as above
16	Lalkear	66	Outside	Mirashi, Chunarughat	Minor	Same as above
17	Barabda	305	Outside	Mirashi, Chunarughat	Minor	Mainly involved illegal tree felling and also with fuelwood collection
18	Bholarjum	139	Outside	Mirashi, Chunarughat	Medium	Mainly involved with fuel wood collection and some with illegal felling
19	Chamaltoli	153	Outside	Sindurkhan, Srimongal	Minor	Same as above
20	Alinagar	289	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly involved illegal tree felling and also with fuel wood collection

21	Krishnanagar	157	Outside	Gazipur, Chunarughat	Minor	Mainly involved with fuel wood collection
22	Basulla	352	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly involved illegal tree felling and also with fuel wood collection
23	Kabilashpur	143	Outside	Gazipur, Chunarughat	Minor-Medium	Involved with both tree felling and fuel wood collection
24	Gazinagar	811	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, illegal felling to some extent
25	Cheganagar	190	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection
26	Barajum	67	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, some illegal felling
27	Kholishabosti	112	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, some illegal felling
28	Chonkhola	245	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, some illegal felling
29	Khatamara	91	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, some illegal felling
30	Gajipur	1305	Outside	Gazipur, Chunarughat	Minor-Medium	Mainly fuel wood collection, some illegal felling
31	Gatabala	156	Outside	Mirashi, Chunarughat	Medium	Mainly involved with fuel wood collection and some with illegal felling
32	Adarshagram	103	Outside	Mirashi, Chunarughat	Medium	Mainly involved with fuel wood collection and some with illegal felling
33	Jalilpur	60	Outside	Mirashi, Chunarughat	Medium	Mainly involved with fuel wood collection and some with illegal felling
34	Nawabad	25	Outside	Mirashi, Chunarughat	Medium	Mainly fuel wood collection

Source: Population Census 2001

Table 11. Information on Outside Villages Having Stakes with Tarap Hill Reserved Forest (Buffer Zone of WS)

Sl. No.	Name of village	Location	Union, Thana	Level of stake	Type of stakes
1	Omarkhata	Outside	Mirasi, Chunarughat	Minor to Medium	fuel wood and illegal timber felling
2	Adarshagram	do	Mirasi, Chunarughat	do	do
3	Sakuntala	do	Mirasi, Chunarughat	do	do
4	Noabad	do	Mirasi, Chunarughat	do	do
5	Akhajura	do	Ranigaon, Chunarughat	do	do
6	Rajakuna	do	Ranigaon, Chunarughat	do	do
7	Islampur (monipur)	do	Ranigaon, Chunarughat	do	do
8	Goromchori	do	Ranigaon, Chunarughat	do	do
9	Nasirabad	do	Ranigaon, Chunarughat	do	do
10	Salamer Tila	do	Ranigaon, Chunarughat	do	do
11	Kamargaon	do	Sindurkhan, Srimanagal	do	do
12	Hamidpur	do	Sindurkhan, Srimanagal	do	do
13	Hoogli	do	Sindurkhan, Srimanagal	do	do
14	Tilagaon	do	Sindurkhan, Srimanagal	do	do
15	Nihar Nirala	do	Sindurkhan, Srimanagal	do	do
16	Buri Bosti	do	Sindurkhan, Srimanagal	do	do
17	Kharirlama	do	Sindurkhan, Srimanagal	do	do
18	Simailat	do	Sindurkhan, Srimanagal	do	do
19	Tupur Tila	do	Sindurkhan, Srimanagal	do	do
20	Shahitala	do	Sindurkhan, Srimanagal	do	do
21	Durganagar	do	Sindurkhan, Srimanagal	do	do

Map of Rema-Kalenga Wildlife Sanctuary

Human Settlements and Pressure on WS

(not to Scale)

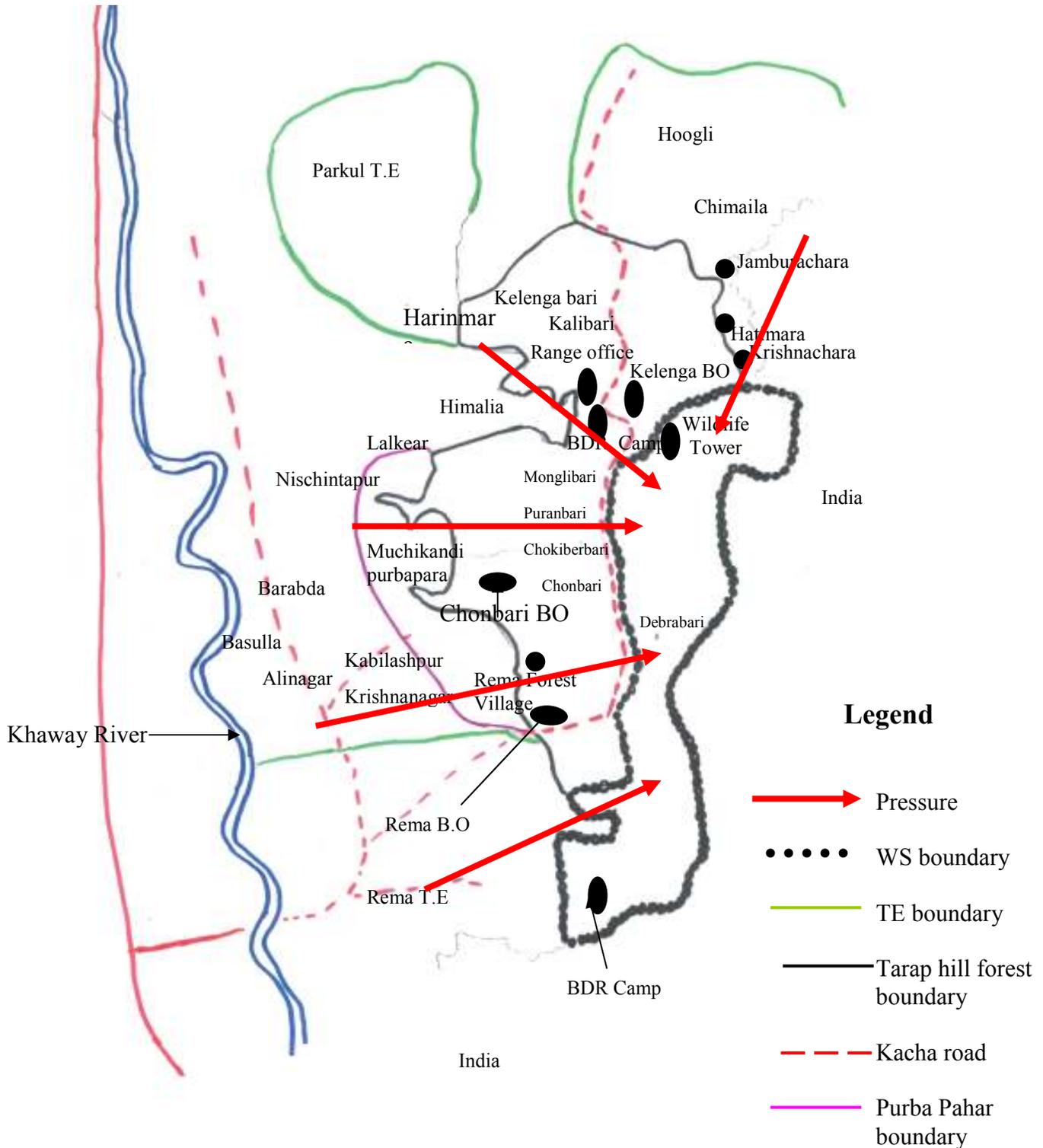


Fig. 5

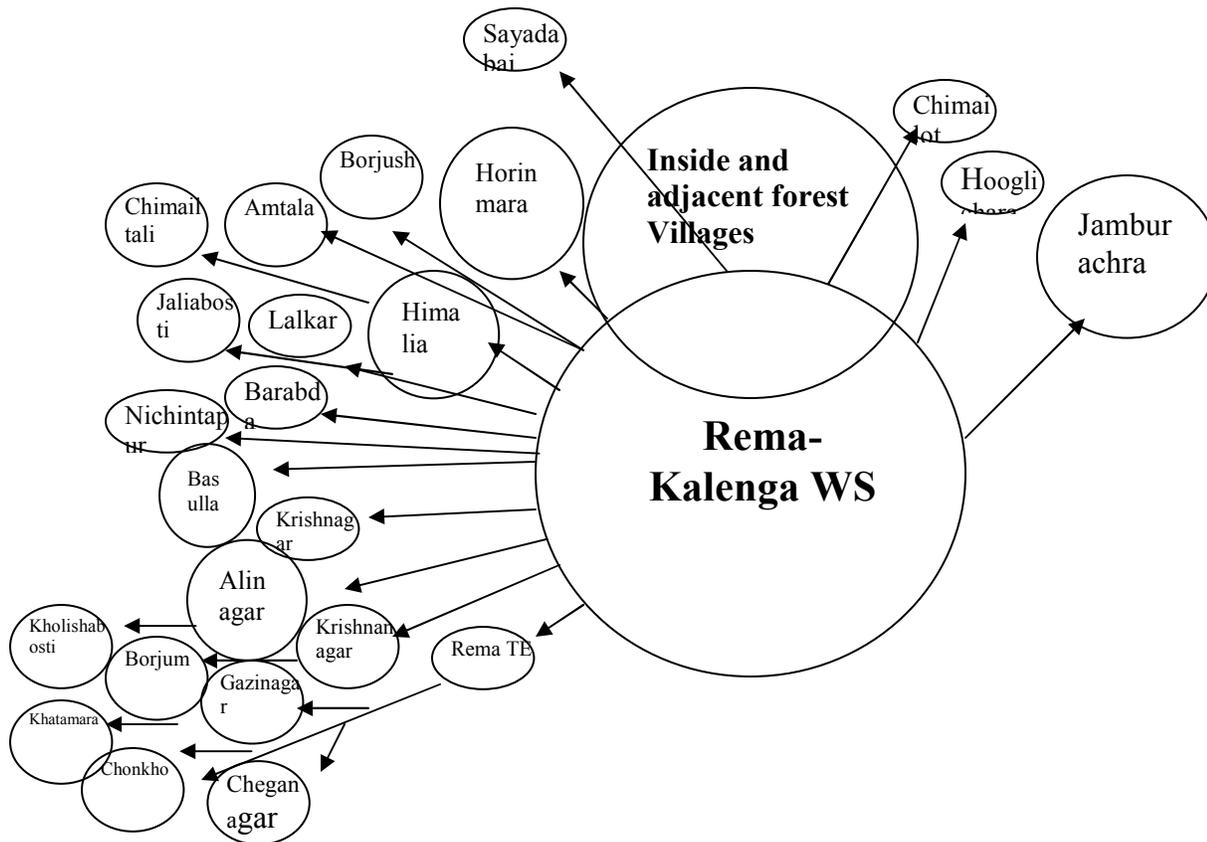


Fig .6 Relative level of stakes of different villages with Rema-Kalenga WS based on resource extraction

4.2.2 Tea estates

There are 3 tea estates around the WS, of them one, namely Rema Tea Estate, borders with WS and has minor-medium stakes as some of its inhabitants infiltrate into the WS for collection of fuel wood, building materials and some of them are involved with illegal tree felling (Table 12). This estate is used as a route for transporting fuel wood and timbers. The Hoogli Tea Estate is located nearby the reserved forest. The other estate, namely Pakrul Tea Estate, is away from the WS and thus has negligible stake.

Table 12. List of tea estates nearby and adjacent to WS having stake

Sl	Tea Estate (TE)	Location	Level of stake
1	Rema TE	South-West and adjacent to the WS	Minor-medium
2	Hoogli TE	East of the WS but adjacent to the reserve forest	Minor
3	Purkul TE	North-west of the WS but nearby to the reserve forest	Negligible

4.3 Stakeholder (SH) Assessment

At least 3 categories of stakeholder groups could be recognized in RKWS, such as

- ⇒ Primary stakeholder- involved with direct extraction of resources from the forest or their activities directly affect the forest
- ⇒ Secondary stakeholder – indirectly linked with the forest, involved with trading or exert influences on the forest

⇒ Institutional stakeholder- involved with developmental activities and administration of the adjoining areas

4.3.1 Primary Stakeholders

Table 13 provides information on stakeholder type & category, stakeholder description, their activities, dependency, relative level of stakes with the WS and their influence. Based on resource extraction, a total of 12 different primary stakeholder types have been identified. Of them, 1 SH group (fuel wood collector) has major stakes with the WS and has major role in WS degradation, while 3 SH groups have medium level of stakes (bamboo collector, house building materials collector and agriculture cultivator) and the rest (8 SH groups) have minor stakes with the forest.

Most of the primary stakeholders are poor people from the inside forest villages and as well as from identified outside villages and labor from tea estates. Old, unemployed adults (male and female) and also children collect fuel wood from Rema-kelnga WS. Adult people carry out illegal felling of timber trees and usually they are poor. Usually, the rich and middle class people are not involved with direct extraction of forest resources. However, they buy many forest resources, including fuel wood and bamboo, and other products from the primary stakeholders. The forest villagers, as being located inside the forest, have major stakes with the WS as they exploit most types of forest resources for their HH needs and also for commercial purposes, followed by poor people from identified outside villages and other outside resource users and tea garden workers.

Table 13. Information On The Primary Stakeholders Of Rema -Kelnga WS (Based On Resource Extraction And Direct Activities In The Forest)

Sl. no.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level of stake	Remarks
01	Fuel wood collector	Primary	Local poor people, Forest villagers Tea garden labor (mainly men and women)	Collect dead trees, small trees, non-timber trees, and youngest of timber trees, tree branches etc. Cut, chop, bundle and carry away as shoulder or head load, sometimes use bicycle, van.	Many HHs dependent for HH use Many HHs sell for live hood support, entirely or partly	Major	Fuel wood collector sometimes collect vegetable Tribal people collect bamboo shoot Pay taka 5/- for each entry
02	Bamboo collector	Primary	Forest villagers, local poor people	Collect bamboo from forest for domestic and commercial use	Some forest villagers and some local poor people are entirely dependent on it.	Medium	Planted bamboo beds are also auctioned and clear felled FD gets revenue from auction
03	Timber poacher	Primary	Adult male from different villages, few unemployed people from tea estates. Mostly poor.	Selectively fell the valued timber trees. Usually enter the reserve forest sometimes in WS at night. Reduce forest cover, thus destroy habitat	Entirely or partly dependent on this activity for their livelihood	Minor	They are organized gangs. They mainly involve in RF area, but sometimes they enter into WS area for illegal felling
04	House Building material Collector	Primary	Forest villagers and adjacent and surrounding people	Collect various materials as per need for HHs building.	Forest villagers are fully and others are partly dependent on it	Medium	
05	Agriculture cultivator	Primary	Forest villagers, outsider	Paddy cultivation, vegetable cultivation	Dependent on this activity for their livelihood support	Medium	Restricted to a designated area used by forest villagers
06	Vegetable collectors	Primary	Forest villagers, poor people, mainly fuel	Collect vegetables, like, kachu, deckishak,	Meet HH needs only	Minor	Forest villagers and most people from

			wood collector and occasionally the outside villagers	kasurshuk, bon aita, gondugi etc.	Not dependent, also met from homestead gardens		outside villagers
07	Fruits collector	Primary	Mainly forest villagers, some local poor people	Mainly collect chamkanthal, kaw, jam, latkan, dumur, hortuki etc and hampered on regeneration of natural trees.	Not dependent	Negligible	
08	Honey collector	Primary	Local people, mainly poor people, forest villager	Collect from forest seasonally and occasionally	Mainly for HH consumption, sell surplus, but not dependent	Negligible	Usually it is not an intended activity
09	Medicinal plants collector	Primary	Some local people and forest villager	Some limited species, not on a large scale	Local people are not dependent but forest villagers are partly dependent	Negligible	Sometimes local kabiraj collect it
10	Hunter/trapper	Primary	Basically forest villagers, sometimes elite and rich from the area and outside the area,	Mainly hunt game birds, wild fowl, wild boar, small deer, Hill Moyna and others for HH consumption and recreation	Not dependent	Minor	Forest villagers traditionally used to hunt every type of wildlife. Presently their activity is limited
11	Bark collector	Primary	Some local people		Not dependable	Negligible	
12	Sun grass collector	Primary	Forest villagers, local poor people	Harvest and bundle and carry as head load or shoulder load.	Meet household needs, some sell for supplementing income during harvesting season.	Minor	Mainly forest villagers and people of adjacent villages

4.3.2 Secondary Stakeholders

A total 4 secondary SH groups have been identified (Table.15). They are not directly involved with forest resource extraction from Rema- Kalenga WS, but are linked with its processing, trading, and utilization. A brief description of these stakeholders and their roles are given below.

4.3.2.1 Fuel wood Trader

A number of fuel wood traders has been identified that have in direct minor stakes with the WS as they buy fuel wood from the local collectors for trading. There are about 2-3 fuel wood traders at Gazipur bazaar, about 2-3 at Sindurkhan and 5-6 at Chunarughat bazaar. Several trucks of fuel wood are transported everyday from this area and a substantial quantity of it comes from WS area. The traders procure fuel wood from the individual collectors, stack them and sell a substantial quantity is sold to local consumers, while the are transported it by trucks, train etc. to Hobighonj, Brahamanbaria, Comilla, Srimongal, Moulavibazar etc. and other local markets.

4.3.2.2 Furniture Shop Owners

There are about 25-30 furniture shops nearby bazaar, mostly located in Chunarughat. Furniture from the area goes to different parts of the country, including Dhaka. Sometimes, this furniture is checked by the FD check post, get it passes through the check post anyway. Furniture shops owner have good links with the sawmill owners and sometimes with timber trader or illegal fellers as well. However, it appears that as limited quantity of timbers come from the WS they have little stake with the WS.

4.3.2.3 Sawmill owners

Sawmills owners have also a minor indirect stake with the WS. A total of 15 saw mills have been found in operation nearby the WS area

Table 14. Distribution of sawmills surrounding the WS

Sl. No.	Location	No. of sawmills
1	Gazipur bazar	01
2	Chunarughat	15
3	Sindurkhan bazar	03
Total		19

There are 1 sawmill at Gazipur 3 sawmills at Sindurkhan and 15 at Chunarughat which are bit away from the Rema-Kalenga WS. Some influential people of the locality own these mills. These sawmills usually receive both legal and illegal timbers for sawing into the logs. The sawmill owners buy illegal timbers at a cheaper rate. Overall, sawmills have minor stakes with the WS.

4.3.2.4. Timber Traders

There are about 15 to 20 timber traders in the area, mainly located at Gazipur area, Nalmuk bazaar, Sindurkhan bazaar--and Chunarughat bazaar, involved with timber trading. Many of them have no valid license for the trading of timber. They usually receive sawed timber from sawmills and trade locally. It is alleged that they sometimes receive illegally felled timber from poachers and get sawed and sell it and thus encourage illegal felling of timber.

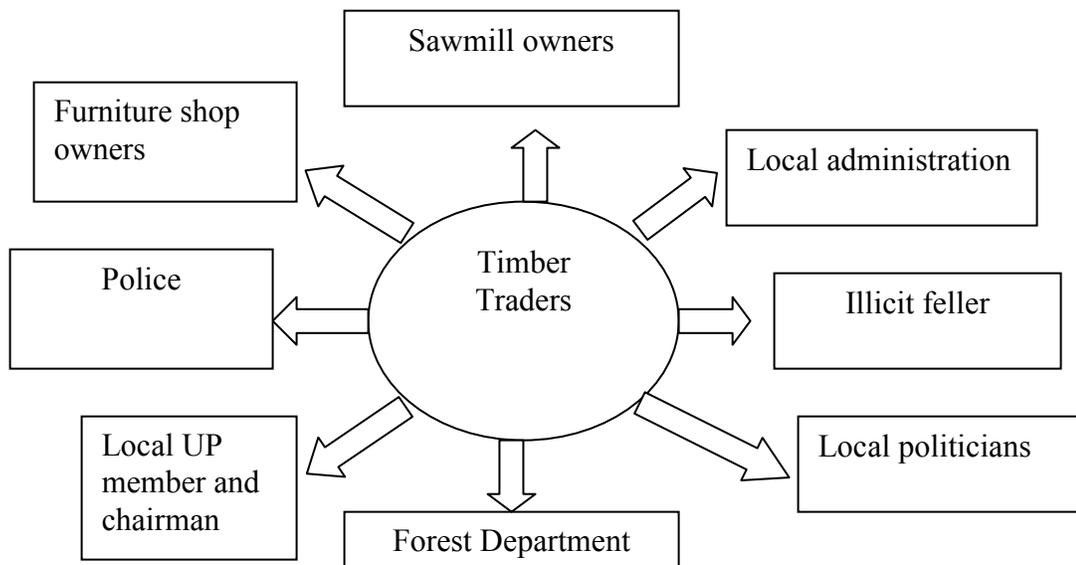


Fig. 7. Link of various stakeholders with Timber traders

Table 15. Information On The Secondary Stakeholders Of RKWS

Sl. no.	SH name	SH types	SH description	Role / Description of Activities of SH	Dependency	Level of stake	Remarks
1	Fuel wood Trader	Secondary	Local people/ outsider/Individual/ Group	Purchase fuel wood from fuel wood collector at trading centre called wholesale market and stock that for further sale	Partly dependable on WS for their business purpose	Medium	The fuel wood that are Purchased from fuel wood collector come from both WS and RF (buffer zone of WS)
2	Furniture shop owners	Secondary	Local people/ Individual/ Group	Have a good link with illegal feller and encourage illegal tree felling by purchasing illegal timber mainly from saw mills	Not dependable on WS but on RF (buffer zone of WS)	Minor	
3	Sawmill owner and operator	Secondary	Local people/ Individual/ Group	Help in conversion of illegal timber and encourage illegal tree felling and trading	Same as above	Minor	
4	Timber trader	Secondary	Local people/ outsider/Individual / Group	Related with legal, illegal timber business. They have a good link with illegal feller and encourage illegal tree felling by purchasing illegal timber.	Same as above	Minor	

4.3.3. Institution/ Organizational Stakeholders

Besides the primary and secondary stakeholders, there are a number of institutions and organizations that are involved with safe guarding, management and welfare of the local people and thus have varying degrees of stakes with the WS. The major institutions/organization having some degree of stakes with, most involved organizations are described below.

4.3.3.1 Forest Department

The FD has the overall responsibility for management, conservation and development of the WS through patrolling and guarding the forest resources and undertaking forest development and management activities. There is 25 local forest staff (4 Beat officers, 3 Attached officers, 13 Guards and 6 Mali in 4 beats) and are inadequate for its management. There is no check post under RKWS.

4.3.3.2 NGOs and credit provider Banks

Among the other institutions, NGOs and banks have direct stakes with the people living around the WS. The major NGOs & bank that operate in the locality are: BRAC, ASA, PASA, Grameen Bank. Besides, Krishi Bank and BRDB also operate in the area. But the above organizations and banks have very limited activities in inside and adjacent villages. The major activities of the NGOs are concentrated on health, education and alternate income generation. Some of them have credit programs exclusively for the women. Several NGOs and banks provide micro-credit to local people (Table.16) for bringing improvement in livelihoods of the local people. These institutions provide micro- credit to local people for undertaking activities for income generation, such as agricultural activities, small business and other IGA activities.

Table16. List of NGOs / Banks Working In RKWS Area

Sl. No.	Name of NGO/ Banks	Location	Activities
1	BRAC	Chunarughat	Micro credit programmers, education, poultry and livestock development
2	ASA	Sindurkhan, chunarughat	Micro credit for agriculture, small business, poultry and livestock
3	BRDB	Chunarughat	Credit programmers, training on agriculture and other IGA
4	Krishi Bank	Sindurkhan	Loan for agriculture in limited area
5	Grameen Bank	Sindurkhan Chunarghat	Credit programmers for small business, poultry, livestock
6	PASA	Chunarughat	Credit programmers
7	RDRS Bangladesh	Chunarughat,	Micro-credit programs, health & sanitation, awareness
8	Caritas	Chunarughat	Credit Program
9	NURSA	Chunarughat	Credit Program
10	INDEVER	Chunarughat	Credit Program
11	USHA	Chunarughat	Credit Program
12	BIZ	Chunarughat, Teliapara	Credit Program

Overall, NGO activities are insufficient to improve livelihoods conditions of the inside, adjacent and the surrounding village people of WS. More IGA supporting initiatives are required to bring changes in the livelihood of the local people. Skill development trainings by the NGOs are also very limited. Fig.7. Shows the relative influence of different NGOs in the area.

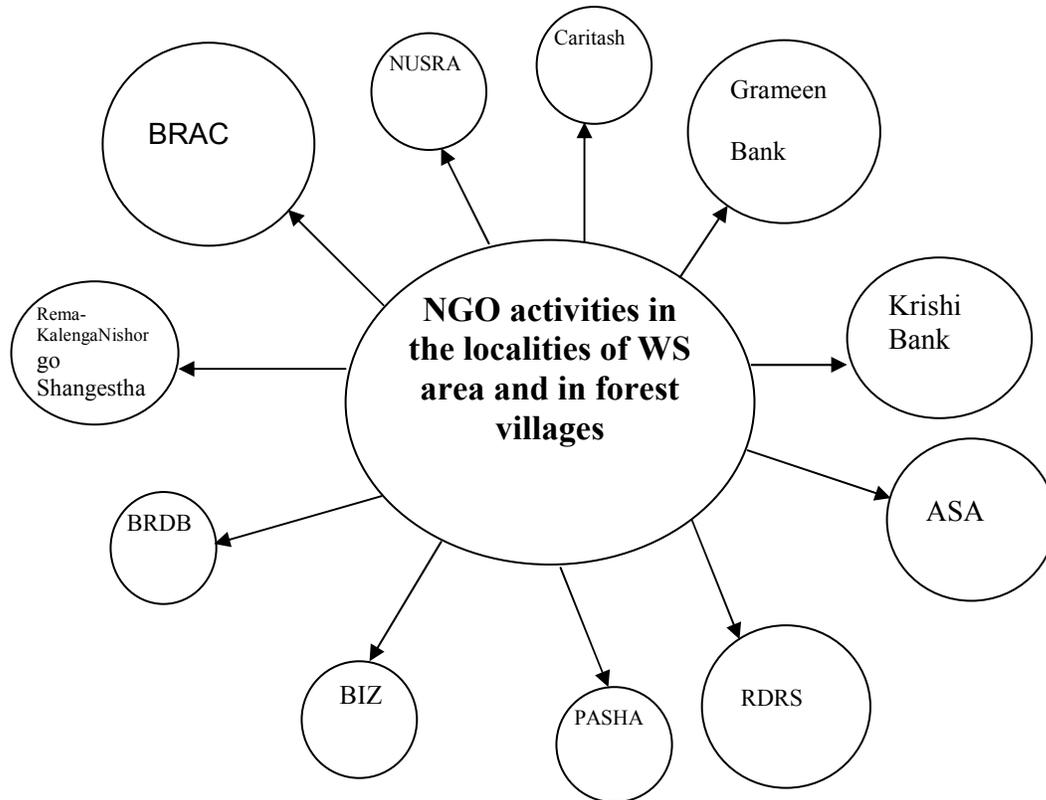


Fig. 8. Scale of activities of various NGOs in SWR locality

4.3.3.3 Local community organization (CBOs)

There are one Co-Management Council, one Co-Management Committee (CMC), sixty Four Forest User Group, one Federation, four Nishorgo Youth Clubs; thirteen Community Development Schools (CDS) that have stake with the community people namely are actively involved in bio-diversity conservation & social work, local problems and welfare, and cultural activities. There is only one CBO in the locality, namely VDP (Village Development Programme), based at Basulla, Gazipur, deal with local problems and welfare and promoting cultural activities. They have 64 members, but not organized and have little influence on the local community.

4.3.3.4 Police, BDR and local administration

Local Police and BDR patrol in the area to maintain overall law and order situation including enforcement of forest protection laws. It was claimed by local people as well as by the FD staff that sometimes police develop a process of negotiation with the illegal tree fellers and other resource users.

There are two BDR check posts inside and adjacent to WS. BDR patrols along the border area and this helps to safe guard the forest resources, particularly against the insurgent across the border. In most cases, BDR's role is highly conducive to forest protection, while that of local police is not.

4.4. Dependency of the Stakeholders on the Forest Resources

Traditionally, forest villagers and the local people are used to collect various resources from Rema-Kaenga WS and adjacent Tarap Hill RF and thus have become dependent partially or entirely on the forest for their HH needs as well as for livelihood support. .

Forest villagers, inside or outside, are entirely dependent for the fuelwood and building materials for meeting HH needs on the forest. It seems that there is no alternate source for its supplies for them. They also collect vegetables, fruits and hunt some wildlife. But they are not dependent on these resources for earning their livelihood. The forest villagers are mainly dependent on the day labor (agriculture and forest) agricultural activities, fuelwood and bamboo collection in the WS and RF area for their livelihood support.

Local timber traders, sawmills and furniture shop owners depend to some extent on the illegal timber from the WS and RF. However, their livelihood is not dependent on the supply of timber from the WS. Similarly, forest villagers are not dependent on timber for their livelihood support but they partially dependent for their house construction and some poor people who are involved with illegal felling are also partially dependent on illegal timber extraction.

Table17. Resource Wise Dependence Of Different Resource Users On Rema-Kalenga WS

SL	Name of resources	Users	Causes	Extent	Dependency	Future risk
01	Timber	Forest villager, local people	Household use, building materials	Less	Negligible	Moderate
		Timber trader	Commercial use	Very less	Not dependant	
		Furniture Shops,	Commercial use	Very less	Not dependant	
		Saw mill owner	Commercial use	Very less	Not dependant	
02	Fuel wood	Forest villager	commercial use (selling for livelihood) and HHs consumption	High	70-80%(inside and adjacent villagers)	High
		Local people	Mainly commercial use (selling for livelihood) and HHs consumption (small amount)	Medium	30-40% mentioned villages and some outsider	
		Local restaurant, tea stall	Burning	Less	15-20%	
03	Bamboo	Forest villager	Mat/chatai making, fencing, basket making, as building	Medium	100%	High

		Local people	As pole, handcrafts, fencing, building materials etc.	Minor-Medium	5-10%	
		Outside users	As above	Very less	Negligible	
04	Building materials collec.	Forest villager, local people	For house building construction	Medium	65-70% forest villager, 5-10% local people	Medium
05	Cane	Local people	Basket binder, other purpose	Less	Negligible	Less
06	Medicinal Plants	Forest villager, local people, a few Kabiraj	As medicine	Less	25-30%	Less
07	Honey	Forest villager, local People	Food, medicine	Very less	Not dependant	Less
08	Herbs	Forest villager, local People	As vegetables	Very less	Negligible	Less
09	Wild life	Forest villager (indigenous people) , local People	For meat (wild fowl, ghughu, wild boar), moyna as hobby.	Very less	Not dependant	Medium
10	Sun grass	Forest villager, local people	Cattle feeding, house roofing	Less	Negligible	Less
11	Fruit	Forest villager, Local People	Food	Very Less	Not dependant	Less
12	Vegetables	Forest villager, local People	Food	Less	50%(Inside and adjacent villagers)	Less
13	Grass	Forest villager, local People	For Cattle feeding	Less	30%(Inside and adjacent villagers) and others few	Less
14	Bark	Local People	For commercial purpose	Less	Minor	Less
15	Orchid	Local People	For commercial purpose	Less	Negligible	No risk

A large number of HHs of the identified villages depend on the extraction of fuelwood and building materials from the forest. It is the poor who collect these resources, mainly for their HHs consumption and also for selling.

The poor people from the neighboring tea estates collect fuelwood and other NTFPs from the forest. Some HHs sell these for added income. Some of them involved with illegal felling of timber and thus are dependent on forest extraction activity.

Table 17 shows the dependence of different stakeholder groups on different resources for their HHs needs and supporting their livelihood. Almost, all HHs of forest villages are dependent on the fuelwood and house building materials, vegetables from the WS for their Site-Level Field Appraisal: Rema-Kalenga WS

HH needs and also collect these for commercial purpose.. As revealed from FGD that about 3-5% HHs completely or partly depend on selling of fuelwood. Almost all-illegal tree feller sells timber and many of them are completely dependent on it, while others do it for added income.

Fig.8 shows the relative level of dependence of different groups of people on the forest. i.e. the pressure exerted by the stakeholders on the forest. Forest villagers are most dependent on the forest and are thus cause most harm to the forest, followed by local poor people, other local users and tea garden labors.

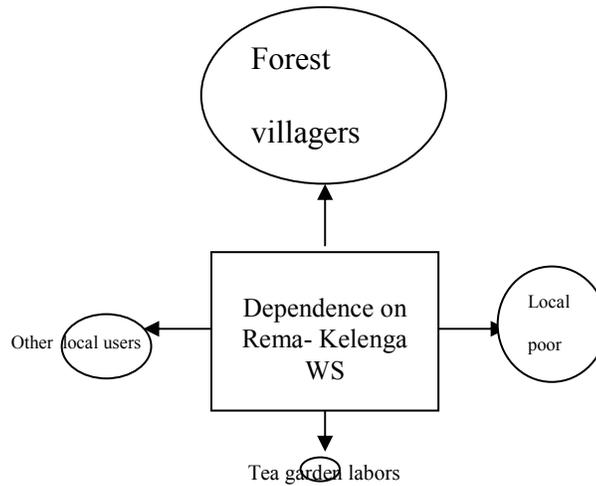
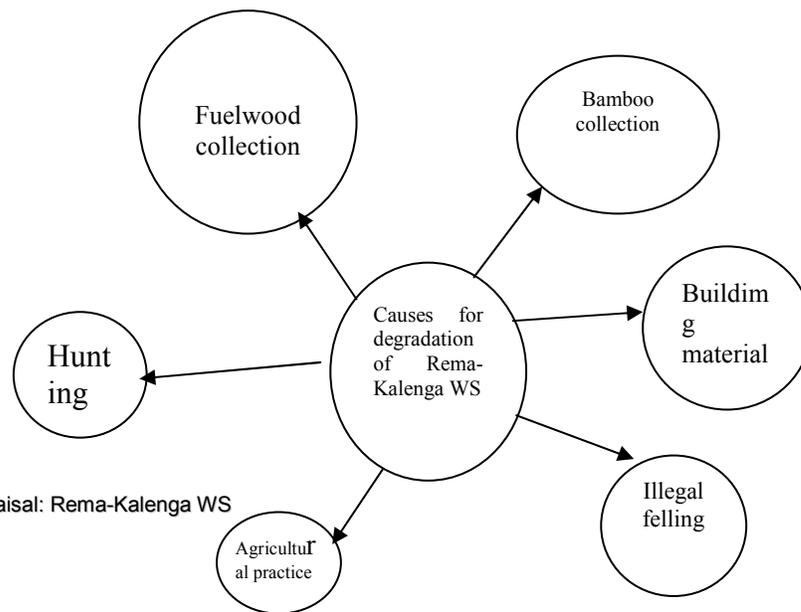


Fig. 8.Relative Level of dependence of major stakeholders groups (demographically) on the forest

4.5 Causes for the Decline in Forest Resources

4.5.1 General cause

Based on the perception of the team developed through discussions with different cross-sections of people in the area, a Venn diagram is constructed on the major causes for the degradation to the forest and its biodiversity and is shown in Fig.9. The major causes for the decline in forest resources in order of magnitude are as follows: fuel wood collection, bamboo collection, collection of house building materials, illegal tree felling, hunting, agricultural practice, live stock grazing, etc Now a day no clear felling & hunting operation and illicit felling is under controlled, CMC takes prompt initiatives against illicit feller, fuel wood collection is decreasing day by day because some fuel wood collector received some grants from NSP.



Pair wise ranking (Table.18) exercises showed that presently fuelwood collection and bamboo collection are the major causes for the decline in forest biodiversity, followed by illegal timber felling, building material collection. Presently, hunting contributes less to forest degradation as the activity is very limited. However, it was the major cause for decline in forest biodiversity in the past.

Table 18. Pair Wise Ranking For Identifying Main Causes For Forest Destruction

	Illegal felling	Fuel wood collection	Building Materials collection	Bamboo collection	Hunting
Illegal felling.	-----	Fuel wood collection	Building Materials collection	Bamboo collection	Illegal felling
Fuel wood collection	Fuel wood collection	-----	Fuel wood collection	Fuel wood collection	Fuel wood collection
Building Materials collection	Building Materials collection	Fuel wood collection	-----	Bamboo collection	Building Materials collection
Bamboo collection	Bamboo collection	Fuel wood collection.	Bamboo collection	-----	Bamboo collection
Hunting	Illegal felling.	Fuel wood collection	Building Materials collection	Bamboo collection	-----
Total score	2	8	4	6	0
Rank	4	1	3	2	

In order to investigate the underlying factors responsible for undertaking of these forest degradation activities by the local people cause and effect ranking was done and the outcomes are shown in Table 19 and 20. The exercises revealed that local poverty and unemployment are the main driving factors for the extraction of forest resources, followed by additional income needs and squeezed income opportunities.

Table 19. Cause and Effect –Ranking (Understanding Underlying Facts for Forest Degradation)

Name of resource Identified	Timber to sell	Fuel wood collection	Bamboo & cane sell	Hunting
Poverty	00	0000	000	
Unemployment	00	000	000	
Additional income needed	0	000	00	
Lack of house building mat.			00	
Forest cases	0			
Income opportunities squeezed		00	0	

FD's poor forest patrol, easy negotiation with local FD staff, poor strength of local FD and emergence of increased local influential people are all contributing to illegal timber felling. Fuel wood collection has been linked to development of transportation system and marketing opportunities (Table 19.).

Table 20. Cause and Effect (Investigating FD's Management Practice and Local Situation)

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

4.6 Exploitation of Forest Resources

A summary of information collected on resource exploitation from Rema- Kalenga WS is provided in Table 21. A total of 15 different types of resource are extracted from the forest. Of them, fuel wood and bamboo are extracted on a large scale, building materials on a medium scale, timber, wildlife, fruits, vegetables, etc. on a minor scale, while honey, cane, medicinal plants, sun-grass on a negligible scale.

The main purposes for resource extraction include meeting HH needs, selling for added income/and or to support and supplement livelihood.

Fuel wood and bamboo collection, timber felling, collection of house building materials, hunting etc. all are posing threats to the forest and its biodiversity through bringing qualitative and quantitative changes in the habitat.

Local poor people, forest villagers and unemployed tea garden labors are the major categories of resource user groups.

Table 21. Information on Resource Extraction from Rema-Kalenga WS

Sl. No	Name of resources	Resource collector	Purpose	Extent	Impact	Future Risk	Destination
1	Timber	Local poor people from adjacent villages, unemployed people, sometimes some forest villager	For selling	Minor	Reduce selectively large tree and forest thickness, loss of habitat and biodiversity	High	Local timber trader, sawmill, furniture shop, urban areas
2	Fuelwood	Local poor people, forest villagers, people from tea estates	For HH consumption selling and HH comp, selling	Large	Loss of habitat, loss of forest biodiversity,	High	Local HHs, local markets, brickfield, transported to urban areas
3	Bamboo	Forest villagers, some local poor people from neighboring villages	Meet HH needs, Handicraft making, selling for added income	Large	Wild stock already heavily depleted, further extract aggravate the situation	Moderate	Local HHs Local and nearby areas
4	Wildlife	Forest villagers Occasionally outsider	For consumption, as hobby	Minor	Stock heavily depleted	High	Local HHs
5	Building materials	Forest villagers Local poor people	Meet HH needs, selling for added income	Medium	Reduce abundance of small trees, loss of habitat, loss of wildlife	Medium	Local HHs Local markets
6	Honey	Forest villagers, local people	Own consumption	Negligible	None	Negligible	-----
7	Cane	Forest villagers, local people	HH use	Negligible	Little collected as they are not much available	Presently negligible	FD has many cane plantations
8	Fruits	Forest villagers, local people, children and women	Own consumption, few for sale in the locality	Minor	Hamper forest regeneration to a little extent	Little	
9	Vegetables	Mainly forest villagers and local poor people	Collect number of species of vegetables	Minor	No apparent impact	Negligible	
10	Sunglass	Local people, forest villagers	Collect as house building mat.	Negligible	Reduce forest biodiversity	Negligible	Removed in the process of plantations
11	Medicinal plants	Few local people, forest villagers	Occasionally collect some selective species	Negligible	Negligible	Minor	Presently restriction has been imposed
12	Herbs	Few local people, forest villagers	As vegetable	Negligible	Negligible	Minor	
13	Grass	Few local people, forest villagers	For cattle grazing	Minor	30%(inside and adjacent) and others few	Minor	

4.6.1 Seasonal changes in resource extraction

Table 22 shows seasonal trend in forest resource exploitation in Rema-Kalenga WS and the adjoining RF. The exploitation of resources from the forest is season dependent. Most of the timbers are illegally felled during the rainy season, as forest patrol is poor during that period. Fuel wood is mainly collected during dry season due to easy accessibility and mobility inside WS during that time. Bamboo extraction mainly takes place in drier months that corresponds to villagers and local needs for mat and handicraft making and house building. Medicinal plants, vegetables and some other forest resources are extracted to some extent mainly during rainy season. A little amount of honey is also extracted during summer (Chaitra-Jaistha).

Table 22. Seasonal Calendar Of Resources Exploitation In Rema –Kelenga WS

Name of Resources	Bais-hak	Jaista	Ashar	Shra-bon	Vadra	Ashin	Katrik	Agrah-ayan	Poush	Magh	Falgun	Chaitra
Timber	00	00	00	00	00	00	0	0	0	0	0	0
Fuel Wood	0000	000	000	000	000	000	0000	00000	00000	00000	00000	00000
Vegetables	0	00	000	000	000	0	0	00	00	00	0	0
Bamboo, building materials	00	0	0	0	0	00	00	000	000	000	000	000
Medicinal Plants	0	0	00	00	00	0	0	0	00	00	00	00
Fish	-		00	00	00	00	00	-	-	-	-	-
Wildlife	00	0	0	0	0	0	0	00	00	00	00	00
Honey	000	0	-	-	-	-	-	-	-	-	-	0

4.6.2 Exploitation of Important Forest Resources

4.6.2.1 Fuel wood collection

Fuel wood collection is a major resource extraction activity in the WS that poses a threat to the forest biodiversity. This is a major and very visible activity in the WS. It is a year round activity, but major extraction occurs during the dry seasons. Fuel wood is collected both for household consumption and commercial purposes.

Most of the collectors are adolescent boys and adults; both male and females and some are children. Most collectors are poor and many of them supplement their income by selling fuel wood. According to local people, 150-200 mounds (1 mound = 37.5 kgs) of fuel wood extracted for commercial purpose and another 40-50 mounds for household consumption every day from the WS and the RF. Each male can carry or collect 2 Bhar (one shoulder load mean 1 Bhar equal to 2 boza or bundle that contains about 1 mound of fuel wood), while a female can collect 1 Bhar per day.

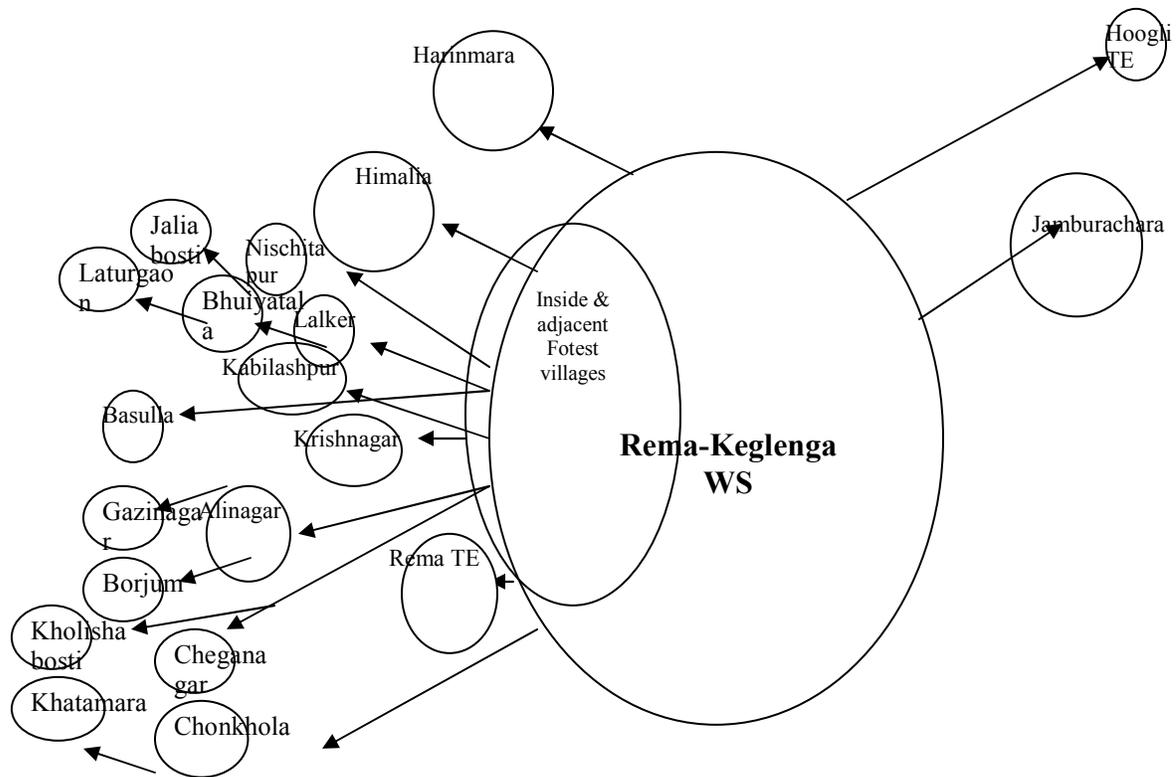


Fig.10. Relative level of fuel wood extraction by different villages

An estimate made by local people, about 200-250 people from forest villages, tea estates and outside villages enter into the WS for fuel wood collection both for commercial and HH consumption purposes. As shown in Fig.10 that the collectors are predominantly from few villages such as Alinagar, Basulla, Gazinagar, Borjum, Chonkhola, Kholishabosti, Khatamara, Cheganagar, Jalia Bosti, Bhuyatali, Laturgaon, Krishnanagar, Kabilashpur, Lalkear, Nichintapur, Himalia, Harinmara, Jamburachara and all Forest villages.

According to local people, about 3-4% outside villagers is entirely dependant on this for their livelihood, and a much larger number of families undertake it to supplement their household income. Some forest villagers are completely dependent on fuel collection from WS for their livelihood support.

Usually the fuel wood collectors enter into WS individually but occasionally they also enter by groups consisting around 15 to 20 peoples. After collecting a bundle of fuel wood, they carry it on their shoulder or head to the nearby convenient place from where they can transport or carry it easily to their selling place. Local people reported that they pay TK. 5 as a levy to the FD for entering the forest to collect fuel wood. Access to the forest for collecting fuel wood is not restricted, if the levy is paid.

The collectors are allowed to collect dead branches of trees. However, in practice, sometimes they cut some young trees, chop and bundle it. Sometimes, they leave a cut tree to get a dead appearance to justify its collection. They also cut the young valued timber trees and small bushy trees.

Among the fuel wood collectors about one third are females.

Besides the local household use, local tea stalls/ restaurants use this fuel wood for burning in their kitchen.

Fuel wood, collected for commercial purposes mainly transported by cycle, truck or as shoulder loads to three markets where it is sold to fuel wood traders or to the local consumers; one wholesale market called Gazipur from where fuel wood is transported to Madabpur, Brahamanbaria, Hobigonj, etc. by truck. The other two wholesale markets are Chunarughat and Sindurkhan, from where fuel wood goes to local consumers.

4.6.2.2 Timber extraction

Although timber is extracted on a limited scale, its extraction is regarded as one of the causes for the destruction of Rema-Kalenga WS. Some people from the surrounding villages are directly involved with the illegal extraction of timber from the WS and its adjacent Tarap Hill RF. The villages such as Alinagar, Basulla, Himalia, Harinmara Jamburachara are more involved. The medium to less involved villages in timber extraction is Krishnagar, Kabalishpur, Gazinaga, Borjum, Khatamara, Kholishabosti, chonkhola, Chaganaga, Barabda, Lalkear, Nichintapur, Amirpur, Laturgao. The peoples who are involved with illegal felling of trees, most of them are poor. Some unemployed labors from two tea estates, such as Rema tea estate and Hoogli tea estate, are probably involved in timber extraction. As per local people, this activity provides cash income of taka 100-200 per day. The illegal fellers have linkage with various agencies, like police, administration, and local powerful political leaders, FD etc. Illegal timber is sold in the local markets, such as Gazipur, Chunarughat, Nunmuk bazaar, Sindurkhan bazaar, Srimongal directly to the sawmill owners and illegal timber traders. The illegal timber may be transported to the various places of the country, mainly to Brahamanbaria, Bhairab, Asugonj, Comilla, and Dhaka etc by truck, bus and train, along with legally felled trees.

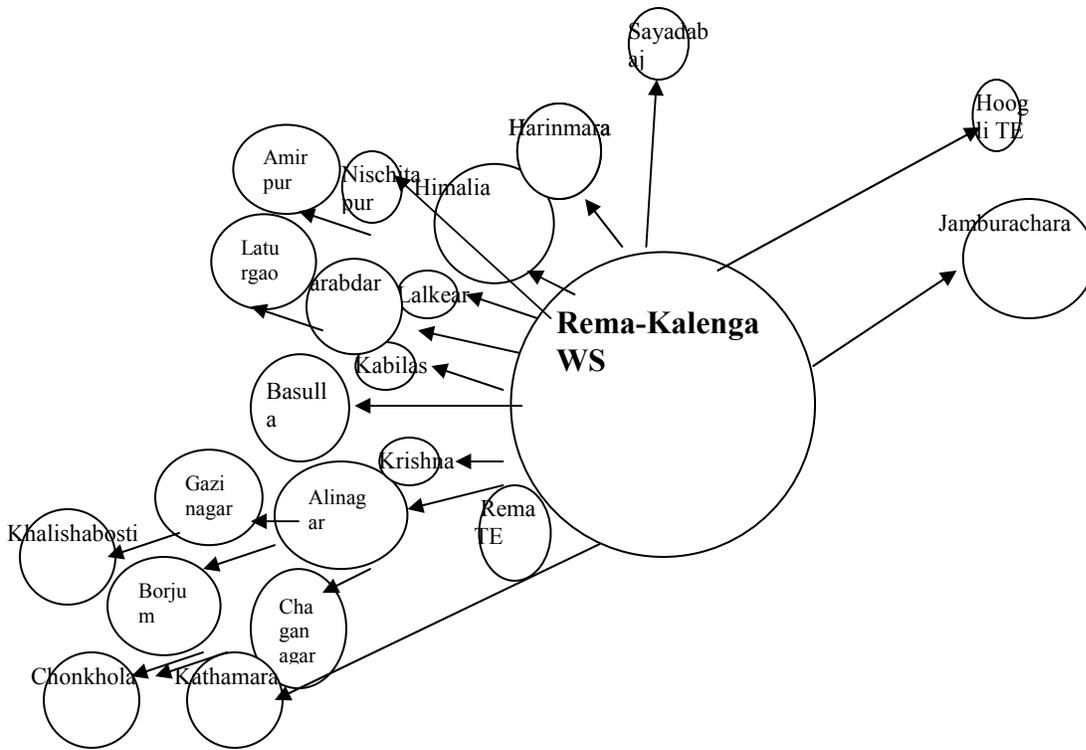


Fig.11. Relative stakes of different villages in illegal felling

4.6.2.3 Bamboo extraction

The process of the extraction of bamboo from the WS is similar to that of timber extraction. Natural mooli and tegra bamboo were highly abundant in the WS. Due to the over exploitation, the stocks of mooli and tengra bamboo become depleted to a great extent. Mooli bamboo is extensively collected both for household use and also for sale. People from distant villages are also used to come for bamboo collection from the WS. Almost 15-20% of tribal HHs are completely dependent on bamboo collection for their livelihood, while most of the HHs are partially dependent on bamboo collection. Bamboo is mainly collected during dry season. As reported for collecting bamboo illegally, collectors pay Tk.10 as a levy to the FD. The forest villagers also pay TK.100 per month during harvesting period of bamboo. Access to the forest for collecting bamboo is not restricted, if the levy is paid. The bamboo is used as building materials, chatai/pati making, fencing for house and vegetables gardens.

4.6.2.4 Collection of House Building Materials

House building materials includes the small indigenous trees, young timber of valued trees and also bamboo and others. This area collected at a medium scale from the Rema-Kalenga WS. The inside and adjacent HHs (forest villagers) obtains their entire building materials from the WS. These are mainly collected during the dry season.

4.6.3. Other Resource Collection

The other resources that are collected on a minor scale include cane, fruits, vegetables, honey etc. These are predominantly collected by HHs of inside and adjacent forest and other villages. The vegetables collected are mainly bamboo shoots (manthana), dhekishak, kachushak, bandhugi, banaita, banana's thor, banana's muchi, ramkala, thankuni, aorai kalai, karam, gantha, muia, palong shak kachu, kachur lati, etc., mainly during rainy season, also in dry season. Major forest fruits that are collected include kow, jam, hill mango, lata mango, chamkathal, latkon, dumur, hill banana, amra, hortuki, boira, tera, jambura, kanthal, cane fruits etc. Fruits are collected mainly for HH consumption. A few of them sell these fruits to their neighbors or to markets for additional income. In addition, there is irregular hunting and trapping of jungle fowl and wild boar, hill moyna parrots, shalik etc. by the indigenous people for HH consumption. The forest villagers and some outside villagers also collected fodder and sungrass from the WS. Some people collect orchids as a commercial activity.

4.7 Other Causes for Forest Degradation

4.7.1 Agricultural Practices

Forest Department allocated some lands to the forest villagers. Some areas have further been encroached by the local people. These lands are mainly situated in between hills in valleys. Some people have extended their plots into the forest lands. The lands have been converted to agricultural plots and extensively used for paddy cultivation. Some allocated land of the forest villagers are leased out to local Bangalee people for a period of 1-3 years. For agricultural purpose, the people have to come across the WS. Besides, they let their cattle free in the WS. In addition to their normal movement through the forest, they also chase various wildlife or create disturbances to them. Further, the establishment of these agricultural plots have contributed to the fragmentation of wildlife habitats. In this way the agricultural practices causes harm to the WS.

4.8 Local Community and Power Structure and Local Governance

4.8.1 Local decision makers and influential people

A total of 31 influential people have been identified in the locality (Table-23). Besides, there are several outsiders who also have influence on the local people and their activities. Enamul Haque Mostafa Shahid, MP and Abdul Kadir Laskar Upazila Chairman, are the most powerful person in the area. Hazi Samir Hossain, Md Abdul Jabbar, Dorbesh Mia, Abdul Jalil Mia, Md. and Abdul Gafur, have very strong linkages with MP. Some of the UP chairmen and members also have good relation with the MP. A few of the UP chairmen seem to have involvement with illegal timber trader informally (Figure.12). Within the forest villages, Hazi Md. Mofizullah, as a headman of Kalenga forest village is influential and have a good relation with FD staff.

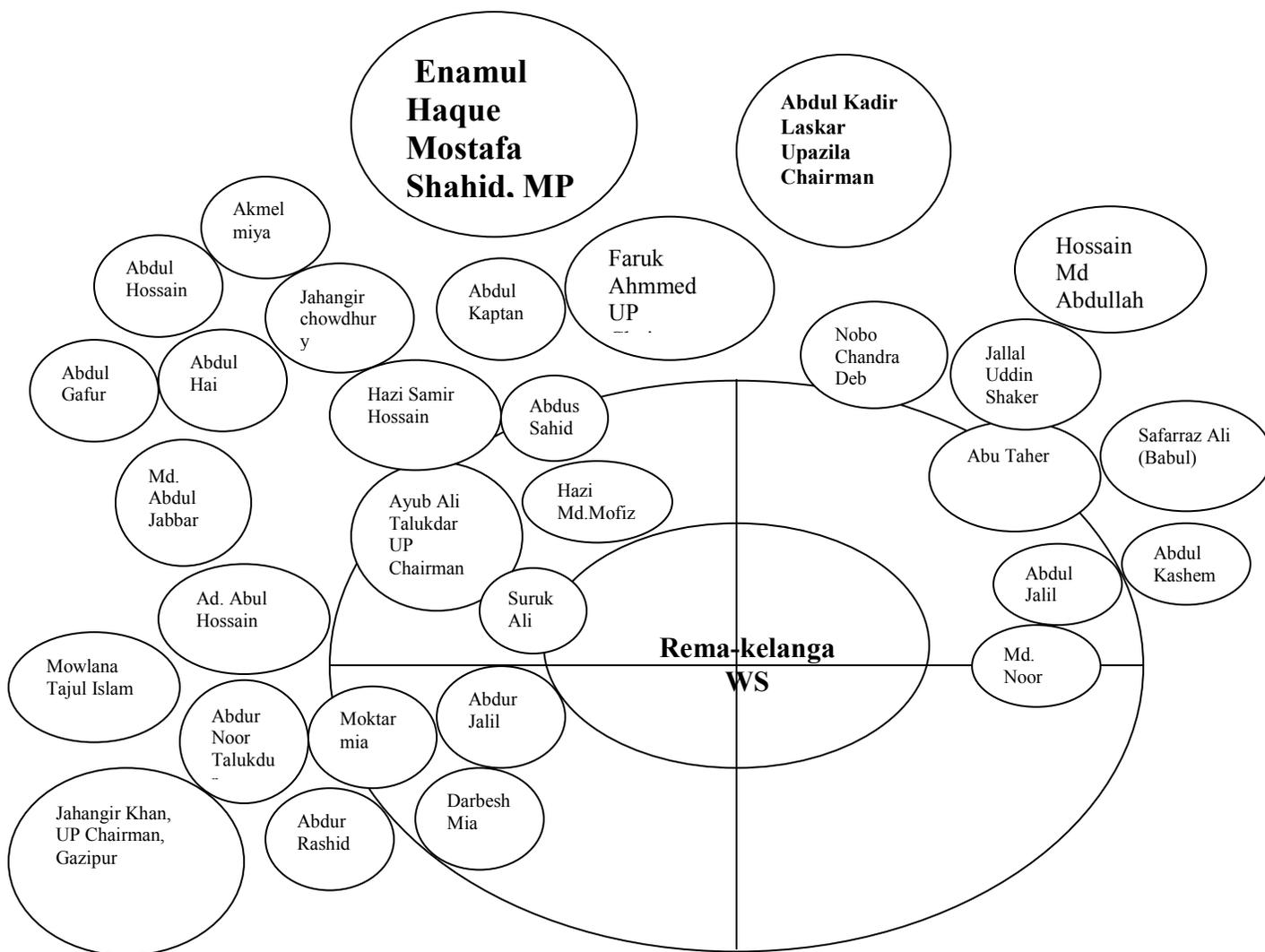


Fig.12.Venn diagram showing power structure of Rema-Kalenga WS area

Table 23. List of most influential persons in different villages in and around Rema-Kalenga WS

Sl no.	Name of influential persons	Designation	Village/ Location
1	Golam Mostafa Shahid	MP	Chunarughat, Madabpur
2	Faruk ahmed	UP chairman	Ranigao
3	Hossain Md. Abdullah	UP Chairman	Sindurkhan (Srimongal Upazala)
4	Hazi Samir Hossain	Mahalder	Chunarughat
5	Abdul Hai	do	do
6	Abdul Kaptan	do	do
7	Akamal Mia	do	do
8	Abul Hossain	do	do
9	Abdul Kadir Laskar	Upazila Chairman	do
10	Jahangir Chowdhury	villager	do
11	Abdul Jabbar	Political person	do
12	Abdul Gafur	Political person	do

Sl no.	Name of influential persons	Designation	Village/ Location
13	Jahangir Chowdhury	UP Chairman	Gazipur
14	Abdur Rashid	Ex-UP Member	Alinagar
15	Abdur Jalil	UP Member	Rema TE
16	Abdur Noor Talukder	Local elite	Gazinagar
17	Darbesh Mia	Local elite	Alinagar
18	Mokter Mia	Local elite	Krishnanagar
19	Advocket Abul Hossain	Political persons	Krishnanagar
20	Hazi Md. Mofizullah	Head man	Kalenga bari forest village
21	Aiub Ali	Ex Chairman	Lalkear
22	Abu Taher	UP chairman	Jamburachara
23	Shafarraj Ali(Babul)	Political persons	Srimongal
24	Md Nuruzzaman	Elite	Jamburachara
26	Abul kashem	Elite	Jamburachara
27	Abdul Jalil	Head Master	Jamburachara
28	Md. Ayub Ali Talukder	UP Chairman	Mirashi
29	Mowlana Tajul Islam	Ex-UP Chairman	Gazipur
30	Md. Surat Ali	Local Elite	Himalia
31	Md. Abdus Shahid	UP Member	Himalia

4.8.2 Local governance

Local Union Parishad is the lower level local government entity and look after local welfare and development of the locality. It has also emerged as the main center for conflict resolution. The UP members, who are elected from different areas of the Union, look after their respective areas. The local public representatives are consulted whenever there is a local issue.

Police administration at Upazila level is the local law-enforcing agency and is involved with maintaining local law and order situation. The police at Chunarughat Upazila are very active and powerful. They are the authority to make arrests of warranted person by forest cases.

Now a day Upazila Parishad is the secondary level local government, the Upazila parishad will be worked under the supervision of Member of Parliament as an executive body in the Upazila and look after local welfare and development. It will be emerged as the secondary center for conflict resolution. The Upazila Chairman, Vice Chairperson male & female are formed a body and all Upazila level officers are supporting them. Upazila Nirbahi Officer will be worked as a secretary of Upazila chairperson.

The tribal people have their traditional way of governance of their community. They are very organized community having respect to their community leaders. Forest villagers have governance system of their own. In each forest village, there is a community leader, called Headman, recognized by the FD. Fig.13 shows the relative involvement of different Government and Non-Government organizations in the locality for local welfare, development and administration

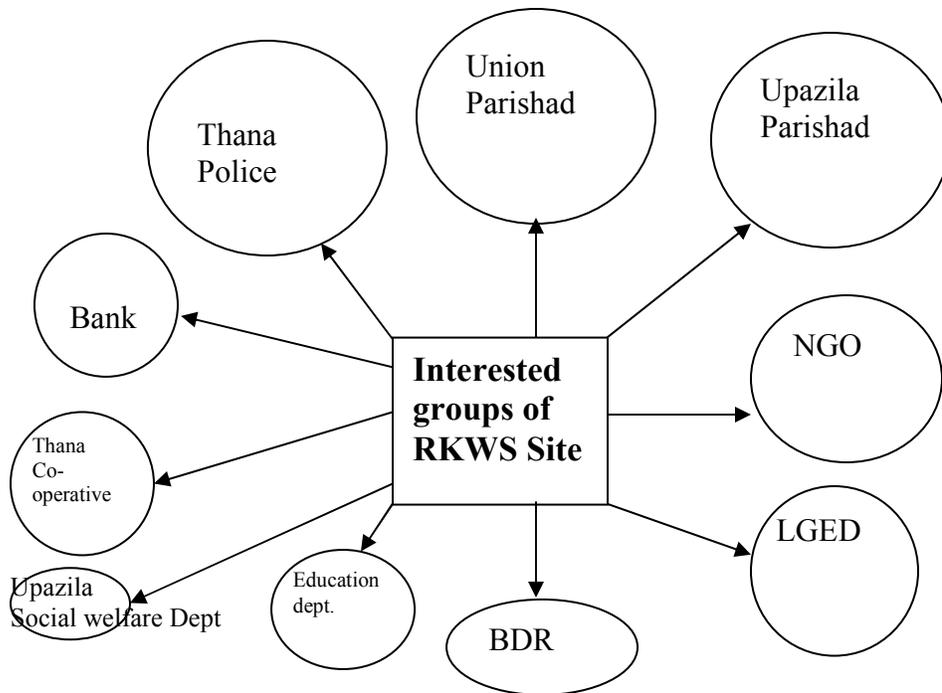
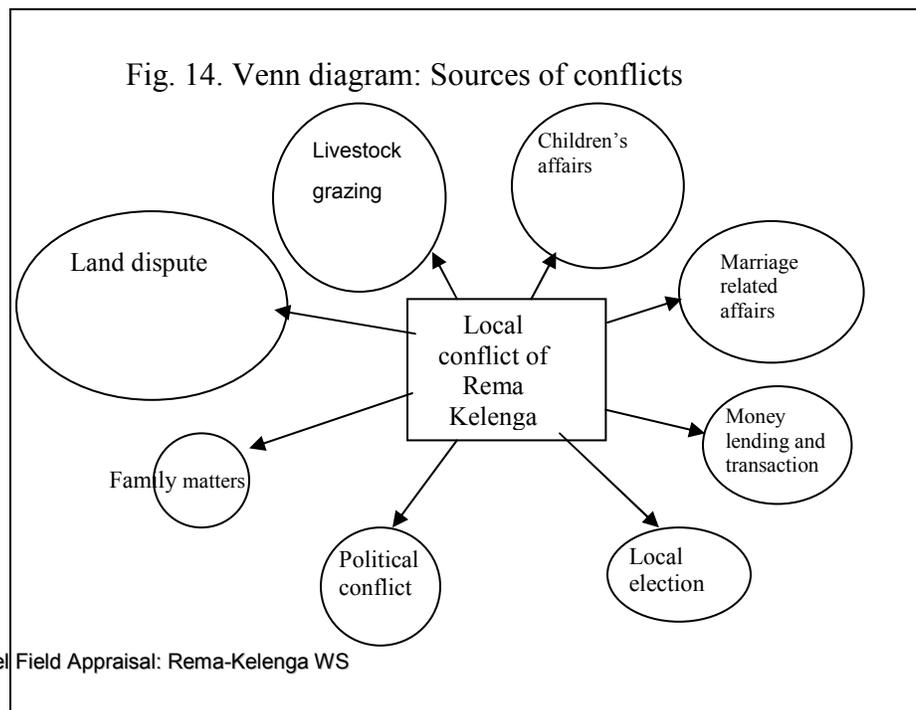


Fig.13. The relative level of involvement of different institutions

4.8.3 Local conflicts, conflicts resolution, social adhesion and cohesion

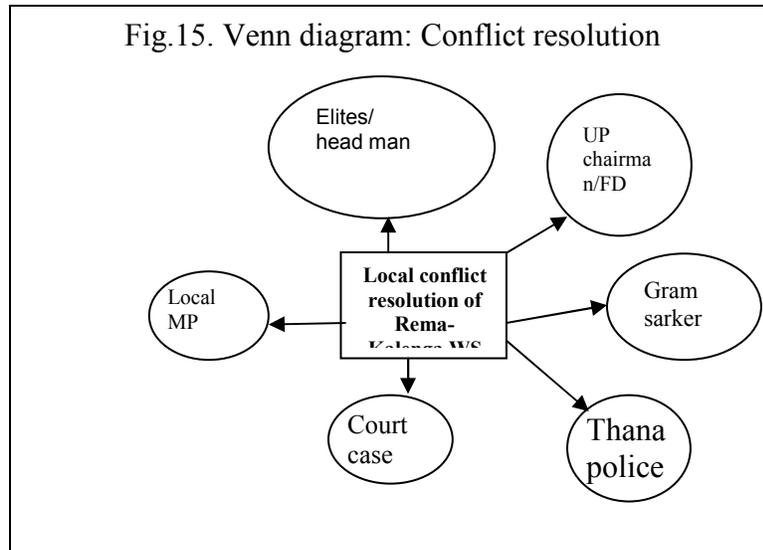
4.8.3.1 Sources of conflict

The main sources of conflicts among local people are land dispute, children affairs, livestock grazing, marriage related affairs, family affairs, money lending, local politics, local elections etc. Conflicts are very limited in tribal community. Major conflicts are represented by land dispute, children affairs, livestock grazing etc. Fig. 14 shows the relative level of the causes for conflict in the area.



4.8.3.2 Conflict resolution

Most cases, conflicts are resolved by arbitration by local elites & public representatives (UP chairman, members), Gram Starker in Bengalis. If the local efforts are not fruitful, it may lead to filing cases with Thana-police, ending up in courts. But in Tribal community Headman or FD Staff resolves conflicts. Fig. 15 shows the conflict resolution process in a village.



4.8.3.3 Conflict with FD

There is a conflict between FD staff and Bangalee people, particularly from different outside villages. Sometimes, it takes the shape of a direct conflict, particularly with tree feller during patrolling, leading into exchanges of fire. However, such conflict happen with tribal and forest villagers.

4.8.4. Social cohesion and adhesion

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

4.9 Local Socio-economic Context

4.9.1 Demographic Profile

4.9.1.1 Households (HHs)

There are about 12 forest villages within the WS and adjoining reserved part of the forest. These villages altogether have about 480 HHs, most of them are ethnic community HHs. The HH data for some of the outside villages have also been collected and given in Table-9.

4.9.1.2 Education

About 80-85% adult people (over 30-35 years of old) are illiterate in the area. Now-a-days, in an average, literacy rate is about 30-35%, of them 80-85% have primary education, 10-15% are high school passed and about 3-5% studied in the colleges and above. However, this picture is much poor in case of inside villages.

4.10 Livelihood Analysis

4.10.1 Occupation

Most of the people of the locality whether inside or outside villagers are involved with agriculture as their main occupation. The major primary occupation of Bangalee forest villagers and outside villagers are agriculture (70-75%), principally paddy /HYV cultivation, followed by labor including agriculture and day labor (15-20%), fuel wood and bamboo collection and timber felling (5-7%), small business, service (1-2%) and overseas employment (1-2%). The major secondary occupations of the villagers are fuel wood and bamboo collection, followed by day labor. Earlier the majority of the tribal HHs were engaged with agricultural activities. In most cases, the occupation now has shifted to day labor, handicraft making and business and fuel wood collection etc. The settler's occupation changed from day laborer to agriculture over time. Table 24 show the trend in changes in occupation in the area with time.

Table 24. Trend in Changes in Occupation People Living in and around Rema- Kalenga WS

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

4.10.2 Richness-poverty level

There are no rich people within the forest villages, but about 4-5% people belong middle class, 70-80% people are poor and about 15- 20% are very poor. Among the outside villagers, the economic condition is a bit better than forest villagers. In the outside villages, about 2-5% people are rich, 10-15% belongs to middle class, 60-70% people are poor and 15-20% is extreme poor.

4.10.3 Unemployment

Among the forest villagers seasonal unemployment is high as they mainly involved with agricultural activities during the rainy season and remain unemployed in the dry season. However, some of them have work round the year as forest day labor. Among the outside

villagers, about 5-8% people remain unemployed round the year, but become increased almost to double during wet and autumn seasons.

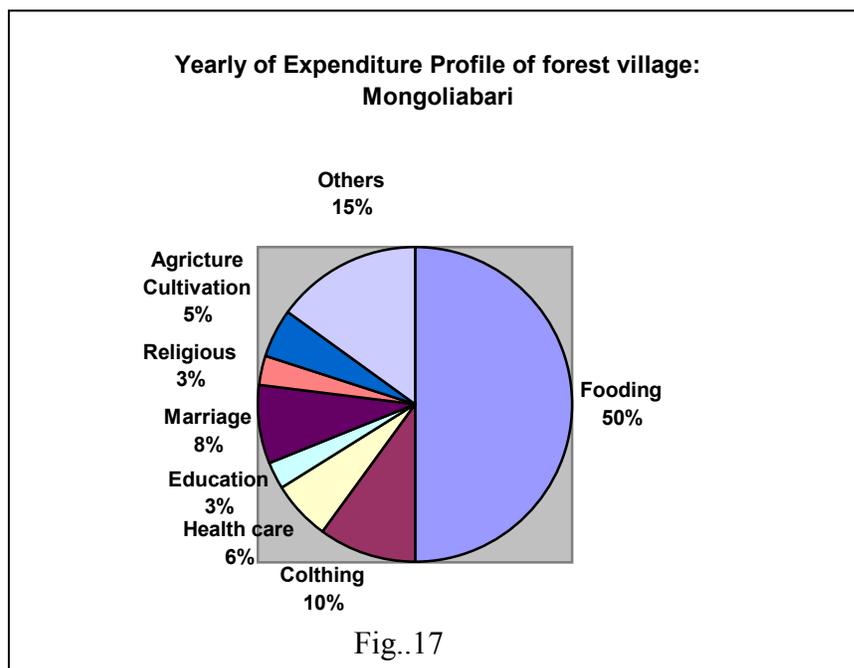
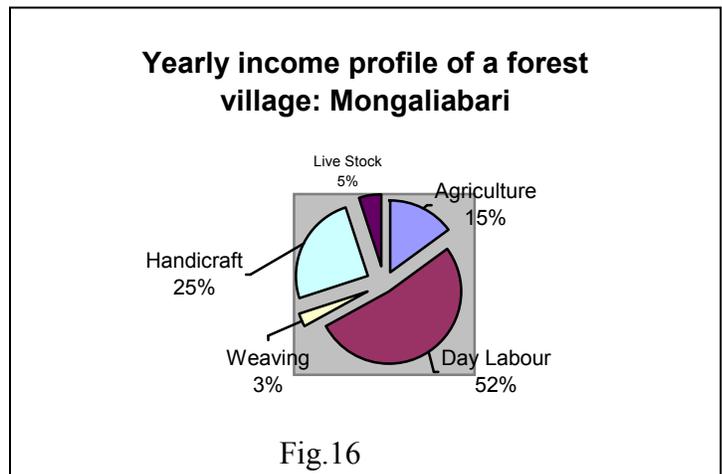
4.10.4 Credit

There are credit facilities are very limited in the area. However, some NGOs operates AIG program through skill development activities. There are BRAC, RDRS Bangladesh and ASA operated some credit programs within the inside villagers, mainly involving women for HH income generation. However, some villagers have formed their own cooperative and operate small-scale credit program within their members, but not in all villages. Among the outside villagers, Krishi Bank, Grameen Bank, RDRS Bangladesh, BRAC provide loans to local people for agriculture, small business, livestock rearing and undertaking other IGA activities. There are several FUGs in the protected area but they did not get any loan from NGOs. NSP took some initiatives for easily getting loan for this reason the FUG under NSP took loan from RDRS Bangladesh as an alternative income generation activities and it also decrease some dependency on forest resources.

4.10.5 Income and expenditure profile

Fig.16 and Fig. 17 present data on income and expenditure profile of a typical HH in a forest village, Mongaliabari, As shown main source of income of the village comes from day labor including agriculture labor and labor in plantation in forest, followed by handcraft making, agriculture farming, fuel wood collection, weaving etc.

On the other hand, the expenditure profile shows that people spend major part of their income for purchasing food, followed by clothing marriage, health care, cultivation expenses etc.



4.10.6 Skill and skill development opportunities

Local people, particularly the tribal, have got some skills, like bamboo basket and mat making, weaving etc. Raw materials are also available there. Besides, there are opportunity for cattle fattening, goat rearing, handicraft making etc. However, the NGO activities regarding skill development is very limited. Under NSP, the FUGs are received some grants against different types of AIGAs after completion training the training program. The training program was fish culture, poultry rearing, milch cow rearing, goat rearing, pig rearing, beef fattening, eco-tourist rickshaw, eco-tourist shop, weaving for the indigenous people, plant nursery, bamboo product development, home gardening etc. NSP also took some initiatives for marketing development of indigenous weaving production with the help of Folk Bangla.

4.11 Social Dynamics (Trend in changes in socio-economics)

4.11.1 General dynamics

Table 25 shows changes in some key socio-economic factors and local activities with time. Compared to 1971 situation, there has been an increase in population; the expenditure of local people has increased with corresponding decline in solvency. The cause behind this that people's income has increased but at the same time livelihood expenses also have increased. Although, literacy rate has increased, unemployment rates have also increased. During this time, use of the forest for both as HH needs and income generation has increased. However, local food scarcity has reduced while opportunities for alternate income have increased. But in case of tribal people food scarcity and unemployment rate have increased due to lack of income generating activities.

Table25. Trend in Changes in Some Socio-Economic Matrices with time in the Rema-Kalenga WS area

Issue	Pre-1971	Before NSP	Present	Causes for change
Settlement/population	00	000	0000	Population growth,
Solvency	00000	0000	000	Livelihood expenditure increased, lack of added income and unemployment
Livelihood expenditure	00	000	00000	Increased price of goods, use of increased commodity
Literacy	0	00	000	Awareness raising, increased educational opportunity
Unemployment	0	00	00000	Cultivated land is given to mortgage to outsider, case in forest villagers, population growth, resource depletion
Use of forest for income	00	000	0000	Poverty, unemployment
Use of forest for HH	00	000	00000	Poverty, Population growth,

Issue	Pre-1971	Before NSP	Present	Causes for change
needs				easy access and no alternate source
Transportation and mobility	0	00	000	Development of road communication and transport
Homestead plantation	0	00	000	For income generation, HHs consumption, awareness
Food scarcity	00000	0000	000	Increased employment opportunity and agricultural development
Credit and IGA	-	-	0	Increased GO, NGOs credit and IGA programs
Occupation	0	0	00	Increment of IGA and small business, day labour in forest

Note: 5 circles to indicate highest abundance/intensities/

4.11.2 Seasonal changes in socio-economics of the local people

Table 26. provides information in changes in some socio-economic parameters and some resource extraction activities in different periods of the year. Unemployment is higher during Agrahayan-Chaitra. Timber felling is more during wet season, while fuelwood collection is more during dry seasons. In summary, except timber felling, most forest resource extraction and related activities take place during dry months.

Table 26. Seasonal Changes In Some Socio-Economic Matrices in Rema-Kalenga WS Area

	Baishak	Jaisthya	Ashar	Shraban	Vadra	Ashyin	Kartik	Agrahayan	Poush	Magh	Falgun	Chaitra
Unemployment	00	0	0	0	0	0	00	000	000	000	000	000
Accessibility to forest	000	00	00	00	00	00	000	0000	0000	0000	0000	0000
Transportation problem	00	000	00000	00000	0000	000	00	00	00	00	00	00
Brickfield/saw mill operation	00	00	0	0	0	0	00	000	0000	0000	0000	000
Forest patrol	0000	000	00	00	00	00	000	0000	0000	0000	0000	0000
Agricultural activities	000	0000	00000	00000	000	00	0	0	0	0	0	00
Timber felling	00	000	000	000	000	000	000	00	00	00	00	00
Fuelwood collection	0000	000	00	00	00	00	000	0000	0000	0000	0000	0000
Bamboo	00	00	00	00	00	00	00	000	0000	0000	0000	000
Building materials	000	00	0	0	0	0	00	00	000	000	000	000
Hunting								0	0	0		
Vegetable collection	000	000	000	000	00	00	00	0	0	0	0	0

4.12 Local Problems

Problem ranking exercise (Table 27) was performed to identify and understand the local level problems and its causal factors. The causes of the problems and its possible solutions were also investigated. The major problems, according to the magnitude, are poverty, unemployment, education, roads communication, electricity, drinking water, etc.

Table 27. Local Problem and its Causes And its Possible Solutions

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

A collation of problem rankings carried out during the PRA showed that poverty is seen to be the main problem, followed by unemployment and income needs (Table 28).

Table 28. Pairwise Ranking of Some Local Problems

Identified problems	Poverty	Unemployment	Food security	Income needs	Fuelwood scarcity	Scarcity of house build. mat
Poverty	-----	Poverty	Poverty	Poverty	Poverty	Poverty
Unemployment	Poverty	---	Unemployed	Income needs	Unemployment	Unemployment
Food security	Poverty	Unemployment	-----	Income need	Food security	Food security
Income needs	Poverty	Income needs	Income needs	-----	Income needs	Income needs
Fuelwood	Poverty	Unemployment	Fuelwood	Income		House build.

scarcity			scarcity	needs	-----	mat
Scarcity of. H. build mat.	Poverty	Unemployment	House build. mat	Income needs	House build. mat	-----
Total	10	06	02	08	01	03
Rank	1	3	5	2	6	4

4.13 Gender Issue

4.13.1 HH decision-making

Table 29 shows the role of different family members in taking HH decisions and Fig. 18 shows their relative influence in decision making. In Rema-Kelenga WS area, husband takes the major HH decisions, followed by wife. But in Bangalee family the husband takes the major HH decisions, followed by wife, sons and daughters.

Table 29. Information On Family Decision-Making

Name of decision	Husband*	Wife	Father	Mother	Elder Brother	Younger Brother	Son	Daughter
Marriage	00000	00						
Sowing crops	00000	00						
Land purchase								
Land mortgage	00000	00						
Treatment	00000	00						
Education	00000	000						
Tree selling								
House making	00000	000						
Cattle Purchase	00000	00						
Loan	00000	00						
Savings	00000	0000						
General expenditure	00000	00						
Resource extraction	00000	00000						

** Husband is the head of the family; N.B. 5 circles have used to indicate highest intensities

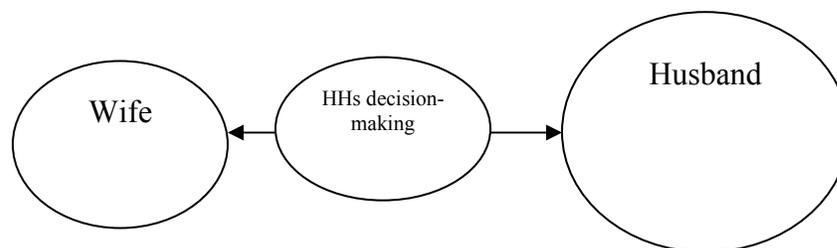


Fig. 18. Venn diagram relative influence of the HHs members in decision
4.13.2 Outdoor mobility and access to credit and IGA

Table 30 shows that the women of the area have moderate mobility. Participation to social events comparatively much less than males. However, women have much higher

access to IGA and credit. Women are moderately discriminated in case of employment in jobs, business etc. But among the tribal community, the picture is different; the tribal community women are more involved in income generation activities.

Table 30. Mobility And Participation In Social Events And Access To Credit And IGA By Male And Female In Rema- Kelenga WS Area.

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

4.13.3 Workload

In general, in Bangalee community, man has more work during Baishakh to Bhadra and again during the winter months. Females have more work during Ashwin to Agrahayan and Falgun to Chaitra. However, in the tribal community (Table 31 and 32), women have more work than men during Ashar-Kartik, for the rest of the time man and woman have equal workload.

Table 31. Seasonal Workload Of Male And Female For Basulla Village Of Rema-Kalenga WS Area

Months / Sex	Baishakh	Jaistha	Ashar	Shrabon	Bhadra	Ashwin	Kartik	Agrahayan	Poush	Magh	Falgun	Chaitra
Male	00000	00000	00000	00000	00000	000	000	000	000	000	00	00
Female	0000	0000	0000	0000	0000	0000	0000	0000	000	000	000	000

Table 32. Seasonal Workload Of Male And Female For Tribal Villages Of Rema-Kalenga WS Area

Months / Sex	Baishakh	Jaistha	Ashar	Shrabon	Bhadra	Ashwin	Kartik	Agrahayan	Poush	Magh	Falgun	Chaitra
Male	00000	0000	000	000	000	000	000	000	000	000	000	000
Female	00000	0000	0000	0000	0000	0000	0000	000	000	000	000	000

4.13.4 Daily work load

Fig. 23 and Fig. 24 show the daily work chart of male and female in a Bangalee family in Rema- Kalenga WS area. The females are typically involved with the household work and also outdoor work. The males mainly do the outdoor works related to income generation.

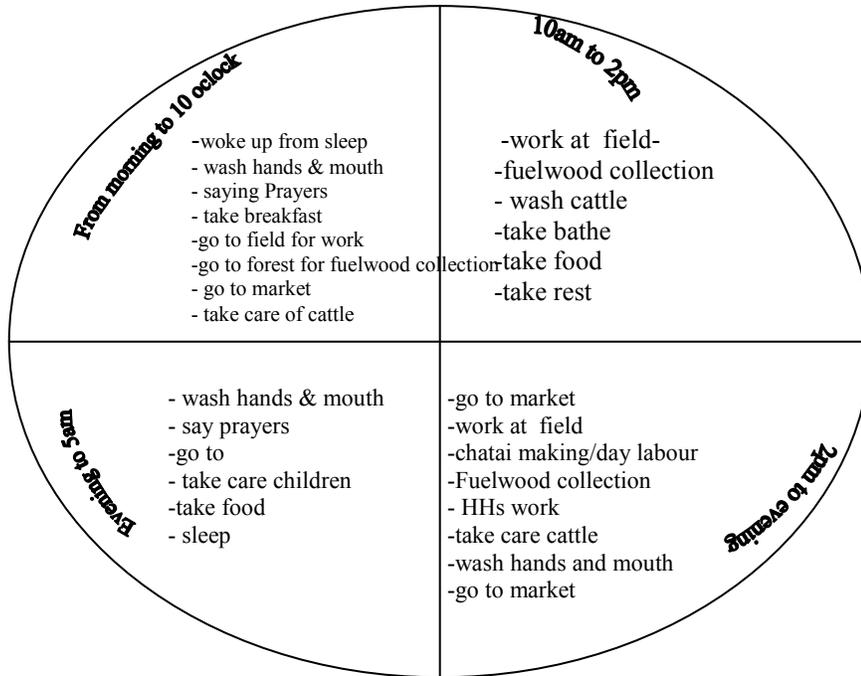


Fig. 19. Daily Work Chart of Men of jamburachara Village

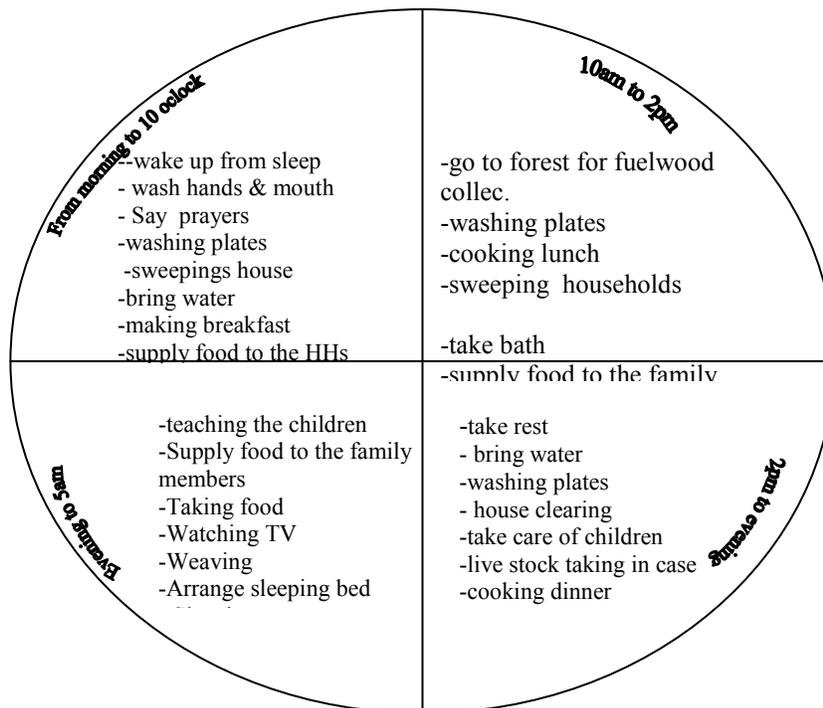


Fig. 20. Daily Work Chart of Women of jamburachara Village

4.13.5. Education

The overall literacy of male and females is more or less equal. In the recent years the number of school going girls are higher than the boys. However, in case of higher studies girls are behind the boys (Table 33). Overall, females are less educated than the male. The overall higher education receiving rate is very low in the area. But in this case the women have no access.

Table 33. Comparison Of Educational Status Of Male And Female In Rema-Kelenga WS

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

Table 34. List of Educational Institution at Rema-Kalenga Landscape Area

SI No.	Name of School	Village	Post.	Upazila	District
Primary School List					
1	Kalenga Govt. Primary School	Kalenga	Mirashi Bazar	Chunarughat	Habiganj
2	Mirashi Govt. Primary School	Mirashi Bazar	Mirashi Bazar	Chunarughat	Habiganj
3	Parkul Govt. Primary School	Parkul	Ranigaon	Chunarughat	Habiganj
4	Garam Chari Govt. Primary School	Garamchari	Ranigaon	Chunarughat	Habiganj
5	Hakajura Govt. Primary School	Hakajura	Ranigaon	Chunarughat	Habiganj
6	Barajus Primary School	Barajus	Ranigaon	Chunarughat	Habiganj
7	Kalikapur Govt. Primary School	Kalikapur	Mirashi Bazar	Chunarughat	Habiganj
8	Bisrabon Govt. Primary School	Bisrabon	Mirashi Bazar	Chunarughat	Habiganj
9	Atikpur Primary School	Atikpur	Mirashi Bazar	Chunarughat	Habiganj
10	Islampur Primary School	Islampur	Ranigaon	Chunarughat	Habiganj
11	Zibdharchara Primary School	Zibdharchara	Ranigaon	Chunarughat	Habiganj
12	Barabda Govt. Primary School	Barabda	Musikandi	Chunarughat	Habiganj
13	Basullah Govt. Primary School	Basullah	Sonachang	Chunarughat	Habiganj
14	Kabilashpur Register Primary School	Kabilash	Sonachang	Chunarughat	Habiganj
15	Alinagar Govt. Primary School	Alinagar	Sonachang	Chunarughat	Habiganj
16	Gazinagar Register Primary School	Gazinagar	Sonachang	Chunarughat	Habiganj
17	Balumara Register Primary School	Balumara	Sonachang	Chunarughat	Habiganj
18	Chekanagar Govt. Primary School	Chekanagar	Sonachang	Chunarughat	Habiganj
19	Jambura Chara Govt. Primary School	Jambura Chara	Sikka	Srimangal	Moulvibazar
20	Huglia Govt. Primary School	Huglia	Sikka	Srimangal	Moulvibazar
21	Nichintapur Govt. Primary School	Nichintapur	Muchikandi	Chunarughat	Habiganj
22	Vholarjum Govt. Primary School	Vholarjum	Muchikandi	Chunarughat	Habiganj
23	Gazabola Govt. Primary School	Gazabola	Mirashi Bazar	Chunarughat	Habiganj

24	Shantinagar Register Primary School	Shantinagar	Muchikandi	Chunarughat	Habiganj
25	Amtala Register Primary School	Amtali	Muchikandi	Chunarughat	Habiganj
26	Sattalia Register Primary School	Sattalia	Mirashi Bazar	Chunarughat	Habiganj
High School List					
1	Kalikapur Junior High School	Kalikapur	Mirashi Bazar	Chunarughat	Habiganj
2	Mirashi High School	Mirashi Bazar	Mirashi Bazar	Chunarughat	Habiganj
3	Chekanagar Junior High School	Chekanagar	Sonachang	Chunarughat	Habiganj
4	Akdhala High School	Akdhala	Rajar bazar	Chunarughat	Habiganj
5	Huglia High School	Huglia	Sikka	Srimangal	Moulvibazar
6	Nalmukh High School	Nalmukh	Muchikandi	Chunarughat	Habiganj
Madrasha List					
1	Kalenga Madrasa	Kalenga	Mirashi Bazar	Chunarughat	Habiganj
2	Taltola Hafizia Madrasa	Kalenga	Mirashi Bazar	Chunarughat	Habiganj
3	Sahpur Madrasa	Sahpur	Mirashi Bazar	Chunarughat	Habiganj
4	Mirashi Hafizia Madrasa	Mirashibazar	Mirashi Bazar	Chunarughat	Habiganj
5	Parkul Madrasa	Parkul	Mirashi Bazar	Chunarughat	Habiganj
6	Hakajura Madrasa	Hakajura	Ranigaon	Chunarughat	Habiganj
7	Ranigaon Kaumi Madrasa	Ranigaon	Mirashi Bazar	Chunarughat	Habiganj
8	Bishgoan Basullah Darussalam Madrasa	Basullah	Sonachang	Chunarughat	Habiganj
9	Jambura Chara Moktab	Jambura Chara	Sikka	Srimangal	Moulvibazar
10	Hatimara Moktab	Jambura Chara	Sikka	Srimangal	Moulvibazar
11	Gazabola Madrasa	Gazabola	Mirashi Bazar	Chunarughat	Habiganj
12	Goaspur Madrasa	Goaspur	Muchikande	Chunarughat	Habiganj
13	Adampur Madrasa	Adampur	Muchikande	Chunarughat	Habiganj
14	Jalia Basti Moshjid Moktab	Jalia Basti	Muchikande	Chunarughat	Habiganj
15	Nishchintapur Moshjid Moktab	Nishchintapur	Muchikande	Chunarughat	Habiganj
16	Latur Gaon Moktab	Latur Gaon	Muchikande	Chunarughat	Habiganj
17	Bairagi Tila Moktab	Bairagi Tila	Mirashi Bazar	Chunarughat	Habiganj
18	Nayabad Moktab	Nayabad	Mirashi Bazar	Chunarughat	Habiganj
19	Bhuyan Tala Moktab	Bhuyan Tala	Muchikande	Chunarughat	Habiganj
20	Hurpara Moktab	Hurpara	Muchikande	Chunarughat	Habiganj
Collage List					
	Chunarughat Govt Degree Collage	Chunarughat	Chunarughat	Chunarughat	Habiganj

4.14 Local Level Awareness and Behavior

Overall, initial response of local people and FD staff was positive towards the project. Local people know the forest as a reserved forest and are not aware of the existence of the RKWS site. Very few of them know about rules and regulations and activities of WS. They know that there are some restrictions in resource exploitation. However, some of them can enter into the forest by paying 5-10 taka for each entry and collect fuel wood and other forest resources in a bunch as head or shoulder load. Local people, particularly the inside people are worried about the degradation in the forest resources. Inside villagers are well behaved and appeared to be cooperative. The outside village people are also good. But some of them showed their extreme curiosity in the project activities. Most of the villagers welcomed the project when they heard about scope of forest conservation and IGA through the project. The local people also emphasize that FD, Police and BDR should have real intention for protecting forest and there should not have any negotiation with them and illegal tree feller. For this reason, NSP formed a CPG consisting of twenty members and they continuously patrol the forest maintaining roster with the help of FD officials. People are aware of forest resource and forest cover degradation and about its adverse impacts. In this regard, they are willing to conserve the forest resources.

4.15 Legal Aspect and Law Enforcement Mechanisms

Forest villagers have an agreement with FD for their settlement. Once FD did these agreements to increase the forest patrolling, plantation activities and they were provided some agricultural land beside their HH. However, the land area provided to them is different from place to place (6 to 9 acres) as the forest villagers mentioned. There might have a chance of land encroachment with this statement. Outside villagers have conflicts with FD staff as most of them try to enter into the forest illegally for their fuel wood collection and sometimes for illegal tree felling from the forest. There are very little conflicts between FD and forest villagers. According to the FD staff in most of the cases the villagers helps them to guard the forest but now a days, some of the bangalees villagers are acting as helper to the illegal tree feller by providing them information.

Law enforcement is insufficient and forest patrol is inadequate in the forest. According to the FD staff, there are very few FD guard to monitor and safeguard the vast forestland with a few obsolete arms. The activity of BDR helps bit in forest protection, particularly in preventing intrusion across the borders. The activity of police is not conducive to forest protection. Forest cases are comparatively less than Lawachara NP and Satchari RF.

4.16 Status and Role of Forest Villagers and Ethnic Community

There are 10 forest villages within and very adjacent to the WS, of them 8 are inhabited by mixed Tipra tribe. The other two are inhabited by local Bangalee. Altogether, total HHs of forest villages are about 286, out of which ethnic community has 167 HHs.

The forest villagers are recognized by the FD has a legal agreement with them. Long back FD allocated those lands for settlement and agriculture in the range of 6-9 bigha to each HH. In return, they help FD in forest patrolling and plantation. Unlike other areas, the forest villagers need to plant about 1200 saplings for plantation in the forest at their own cost. The forest villager seems to comply with the agreement. The ethnic community depends on many resources for their HHs needs and added income. These include fuel wood, bamboo, house building materials and others. They also collect fruits, vegetables, medicinal plants, fish, and wild animals.

Their all time presence inside the forest is not conducive for the forest dwelling animals. As per their statement that they can not increase the HH number beyond the registered number.

The forest villagers informally leases out to other people. The leasing rate is Tk. 500 for a year/bigha. Sometimes, if they take more than Tk 1000 then the leasee will enjoy the as long as the leased money is returned and eventually the land may be grabbed by the lease.

The forest villagers and the ethnic people have their own governance system. There is a headman in each forest village and deal with his community matters. He is very powerful man in the community.

The occupation of the forest and ethnic community has changed over time. Earlier they mainly faremer, but presently many of them have become agricultural day labor.

5. Threats, Issues and Challenges for the Project

5.1 Threats to the Sanctuary and its Biodiversity

5.1.1 Collection of fuel wood, bamboo and other house building materials

This is the major threat to the biodiversity of the WS. Fuel wood is collected extensively both for HHs needs and commercial purposes. Almost all the inside and adjacent HHs collect fuel wood predominantly from the sanctuary area. Collector mainly collects the young plants, less valuable and fruit trees. In this way, regeneration process of the forest is severely hampered leading to reduced biodiversity of the sanctuary. Bamboo is also extensively collected for purposes and has led to the serious depletion in bamboo stocks. Similarly, many types of indigenous non-commercial tree species are collected for building their houses. All these activities adversely affect the forest regeneration and contribute to poor abundance of these exploited species and at the same time also contribute to habitat loss for wildlife.

5.1.2 Livestock grazing

Livestock, mainly cattle and buffalos, grazing is widespread within the sanctuary area, particularly in the north. The cattle brows on seedling and undergrowth and thus interfere with natural regeneration of the forest.

5.1.3 Agricultural encroachment

A number of narrow valleys are present in the sanctuary. The valleys harbor wild animals and facilitate corridor from one place to another. These areas have been either allocated to or encroached by forest resident and outsiders. In course of time they further penetrated into the forest. Conversion of land and agricultural activities inside the forest cause harm to wildlife and regeneration of forest.

5.1.4 Illegal tree felling

Although, illegal felling is not widespread within the sanctuary areas, as valued trees is very less abundant within the sanctuary area, still a small number of indigenous timber trees are felled and this remain as a minor threat to the forest.

5.1.5 Hunting

Widespread hunting in the past contributed greatly to the reduction in wildlife diversity in the past RF. No Hunting activities are done in SWR now,

5.1.6 Forest fire

Occasionally forest fires are found in the sanctuary area and done intentionally, mainly for hunting and for facilitating extension of sun-grass beds. This process interferes with the regeneration process.

5.1.6 Collection of Tree Bark

Tree bark is extensively collected from the sanctuary area, mainly from Hargaza tree for commercial purposes. It is reported that bark from the particular tree is used in mosquito coil. Presently, about 90% tree of the particular species is affected, resulting in the death and reduced growth.

5.2 Issues of Concern

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

Reduced forest regeneration: Mainly caused due to fuel wood collection, cattle grazing and forest fires.

Agricultural encroachment: Leads to habitat fragmentation and causing disturbances to wildlife.

Over- and unsustainable resource exploitation: Mainly include collection of fuel wood, bamboo, building materials etc. and pose threats to abundance to the resources.

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

Poor forest management by the FD and lack of specific GR management action plan: As became apparent from the appraisal process that the forest was poorly managed by the FD, primarily due to lack of adequate and skilled man power for GR management, lack of logistics and incentives. Besides, the poor morale of local FD staff had been identified as a major cause for illegal use of forest. Most importantly, there was no specific management action plans for the Satchari RF but under NSP forest land is patrolling with the help of CPG members and FD developed a specific forest management plan for Satchari.

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

Presence of forest villagers inside the forest: As discussed earlier that the forest villagers, mainly they are ethnic people, dependent on forest resources for their livelihood and HHs needs and this the major threat for biodiversity. Therefore, this is issue of concern for the project.

Lack of awareness among local people about biodiversity conservation: There was serious lack in understanding about benefit of biodiversity conservation and need for sustainable management among the local people. It seems that enhancement local level awareness could help in the implementation of ten projects. But in the NSP did some awareness program like school awareness program, awareness through youth club, CDS school and also FUG meeting.

5.3 Challenges for the Project

Stopping fuel wood, bamboo and building material collection: As there is little alternative source for these resources in the locality and as livelihood of many HHs are dependent on this, it will be difficult to make a ban on the collection of these resources. Therefore there will be a huge task in addressing the issue.

Reducing local poverty and unemployment: Unless the issue is not addressed the illegal use of forest resources may not be stopped. However, probably, it will be a difficult job for the project to address this issue..

Establishing co-management regimes for biodiversity conservation: Approach for resource management involving the various stakeholders was new in the country. It had huge task for the project in bringing the parties, particularly the local community on board could be a difficult job and to ensure their participation in all stages of project implementation. NSP formed a Co-Management Council and CO-Management Committee. They are doing their job according but after completion of the project how they can survive, IPAC will be worked here.

5.4. Opportunities

Positive responsiveness of the local people:

The general people showed interest in the project. This aptitude of local people could utilize to ensure their participation in the project and thus will help in establishing co-management.

Ecotourism development:

The CMC of RKWS site prepared a micro-plan on Eco-tourism activities. The CMC members are managing the park site in tourist season. They also discussed in their monthly CMC meeting on regular basis. A good number of visitors come to the RKWS site during all over the year, mainly for picnic purposes as well for nature observation. They enter the forest and hike half hour, one hour, three hours & four hours trail. Under NSP project an Interpretation centre has been built for the visitor.

Buffer zone plantations:

NSP completed 25kms road side tree plantation in the buffer area and approximately 200ha buffer plantation for selecting beneficiaries. There are also huge denuded and clear felled forest areas within and surrounding the WS and adjoining reserved part of forest. There are also khaslands besides reserved forest. This land could be brought under social afforestation schemes and could be used as sustainable resource exploitation zones. This scheme may reduce the dependency on the RF resources.

Scope for alternate income generation activities:

There is a good scope for undertaking various AIG activities, such as basket making, handicraft making, lemon cultivation, poultry, cattle fattening, weaving, fish culture etc. This will help to reduce dependence on forest uses.

6. Suggestions and Recommendations

6.1 Administrative

Poor forest management by the FD has been identified as one of the major causes for the forest degradation. Therefore, there is an urgent need to strengthening the local FD at the sanctuary with adequate and skilled manpower and to capacitate them in dealing with co-management of Protected Areas. Specifically the FD may strongly consider the following:

- ▶ Adequate staffing, particularly for forest patrol under a skilled PA management manager
- ▶ More capacity building training for all local forest managers on sustainable management of forest resources and biodiversity conservation
- ▶ Providing appropriate logistics, like vehicle and modern arms and ammunitions to local FD
- ▶ Provision for providing incentives to local FD staff to make the job lucrative
- ▶ Steps for improving the morale of FD local staff and make them dedicated to biodiversity conservation
- ▶ Erection of fencing at strategic places of the park
- ▶ Provision for strong monitoring and supervision of local activities by a central cell.

6.2 Scientific and Technical Management of the park

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

- ▶ A plan of actions for re-introduction and rehabilitation of endangered and plants and animals species
- ▶ A plan of actions for protection and sustainable uses of forest resources and biodiversity
- ▶ A long term monitoring program to track the changes in local biodiversity so that necessary actions could be taken to maintain the biodiversity status of the WS.

Some Specific suggestions

- ▶ As the forest has become thin in many places, as a short time strategy, plantation with indigenous fruit bearing trees could be done. Priority should be on the species (e.g. fig, banyan, dewa etc.) on which the local wildlife are dependent for shelter and food.
- ▶ A rehabilitation scheme should separately be considered for the non-human primates, the most important component of the Rema-Kalenga WS ecosystem, to this end the following could be considered:
 - Re-establishment of habitat continuity between the fragmented habitats of the primates
 - Plantation scheme with food trees suitable for the non-human primates
 - Considering the local dependence on the forest resources, sustainable use of some resources, like vegetables, honey, medicinal plants and other non-timber forest products may be allowed. This requires a change in the policy.

► Fuel wood, bamboo and some other major building materials collection should be stopped on a short term basis, but may not be a success as long as there is a scarcity of its supplies remains in the area. However, once the stock is recovered these may allowed exploiting on the basis of principle of sustainable use. Therefore, project should strongly consider the following:

► Collection of tree bark must be stopped.

► Establishment of more buffer sustainable resource use zone around the PA with provision for fuel wood plots, woodlots and other plantations required for house building purposes

► Providing resource substitution (for example, commercialization of fuel made of rice husk and others)

► Provide some incentives for Promotion of fuel efficient stoves in the locality again.

► Promotion of homestead plantations again

► The encroached land, whether legal or illegal, at least for some strategic places, should be brought back under FD control with provision for trade off with owner and/or encroachers.

► Poor resource users, particularly those who are dependent on the forest for their livelihood, should be identified and brought under AIG program with provision that they give up the unsustainable use of forest resources. The possible AIG opportunities include, cane and bamboo based handicraft, ginger cultivation, weaving, dairy and fish culture, poultry etc.

► Approach should be taken to bring the local elites on board with the concept of forest protection.

► Awareness activity should be done on priority basis in the area to make the people understand how the people could be benefited out of this project

► Project should also make provisions for generating scientific and social knowledgebase on the sanctuary. On an immediate basis a comprehensive faunal inventories should be made. Investigations in to the threatened categories of plants should be made on a priority basis and a management scheme for their protection and rehabilitation should be developed.

► Project should make effort to negotiate with local development partners for extending social welfare services to the area.

Pictorial Description: Rema-Kelenga WS



A boy carrying fuelwood from Rema-Kalenga Wildlife Sanctuary



Stumps of illegally felled tree near Rema beat (within reserved part of the forest)



PRA team members are preparing a social map with the help of some villagers at Bashullah Bazar.



Kalenga to Chanbari connecting road is broken by landslide



Rice & banana cultivated by indigenous people within the Wildlife Sanctuary area



PRA Team members are collecting information through individual survey at Nalmukh Bazar



You will be enjoyed a lot of beautiful scenery like this if you get a chance for visiting Rema-Kelenga Wildlife Sanctuary area.



Forest fire damaged bio-diversity & natural beauty of the forest near the Rema beat office

Annexure-1

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

a. Checklist of questions for FGD

I. Stakeholder Assessment

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

II. Resources and resource status

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

III. Power structure and local conflict

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

IV. Resource exploitation

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

19. Do the local people collect medicinal plants from the forest? Are they available now a day?

V. Demographic profile

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

VI. Socio-economic activities/livelihood strategies

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

VII. Gender issues

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

IX. Others

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

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

Stakeholders Assessment

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

Power structure and local conflict

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

Resources and resource status

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

Resource exploitation and dependency on forest

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

Demographic profile

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

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

Socio-economic activities/livelihood strategies

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

Legal aspects

34. Can anybody can go to the forest and collect any thing?
35. Is there illegal tree felling? Is it at large scale? Does it affect forest health? Are the feller local or come from outside?
36. What are the main reasons for tree felling?
37. Do you think that the forest department people are protecting the forest resources?
38. Is there any issue of forestland encroachment? What are problem with recovery of these land?

Gender issues

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

Others:

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

c. Checklist of questions for HH interview

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

Stakeholders

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

Resources and resource status

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

Resource exploitation and dependency on forest

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

Power structure and local conflict

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

Demographic profile

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

Socio-economic activities/livelihood strategies

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

Resource regeneration practices

33. Are there many plant nurseries in the locality?

Legal aspects

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

Annexure-2

PRA issues

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

Understanding the forest make up and dynamics

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

The transect map should indicate

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

Trend analysis in forest dynamics: changes with time of the following: forest cover and thickness, abundance of tall trees and herbs and shrubs, settlements, population

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

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

Understanding the land encroachment process: Important for Teknaf and Chunati

- historical perspective and trend
- who and how
- uses and transformation
- legalization process
- causal factors
- impact on forest

Understanding local governance system and community structure and functions

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

PRA ISSUES

Fuelwood collection/collector

Information to be collected:

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

Illegal timber felling

Information to be collected:

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

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

Collection of trees as building materials

Information to be collected:

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

Bamboo and cane collection

Information to be collected:

- who collect (adult, boys or girls/ women, poor or reach/ employed labor, gang/armed gang, local/outsider if possible mention the settlements from where they come etc.)
- purpose of collection (for selling, HH consumption or both)
- what compels them to extract the resource

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

Information the Ethnic community:

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

Information on Forest villagers:

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

Understanding the land encroachment

- ❑ Historical perspective and trend
- ❑ Who encroaches and reason for encroachment and what drives to undertake the activity
- ❑ Legalization of process
- ❑ Conflicts and negotiation process
- ❑ Uses and transformation of encroached land
- ❑ What encourages them to encroach land
- ❑ Local mechanisms/system or traditional practice for land encroachment
- ❑ Trend in the changes in the intensity of the activity

FD's forest management regimes

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

FD's plantation strategies

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

Information on Brickfield/ Brickfield owners (Rema-Kelenga)

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

Information on Sawmill/ Sawmill owners (Rema-Kelenga)

- ❑ Nos. and distribution
- ❑ Owners and their influences
- ❑ Compliance to forest laws

- ❑ Period of operation
- ❑ Who brings timber to them
- ❑ Sources of timber (from the forest concern or from elsewhere-homestead)
- ❑ How distinction is made between timber from the forest and that from villages
- ❑ Inspection by FD/or other law enforcing authority
- ❑ Network of supplies

Livestock grazing (Rema-Kelenga)

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

FGD with Tea Garden people (Rema-Kelenga, 1)

- ❑ Unemployment in the labor colony
- ❑ Penetration to NP?WS /RF by tea garden people
- ❑ Resource collected from the forest
- ❑ Reasons for invading the forest and collecting resources
- ❑ Ecosystem continuity with the forest
- ❑ Role of Tea Garden management in preventing poaching