



## Site-Level Field Appraisal for Protected Area Co-Management: Teknaf Game Reserve





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## EXECUTIVE SUMMARY

1. A two-step rapid appraisal process, initial Rapid Rural Appraisal (RRA), followed by subsequent Participatory Rural Appraisal (PRA), was undertaken to make a comprehensive situational analysis of the Teknaf Game Reserve (GR) during May-July, 2004, aiming at helping to shape the future activities for the improved management of the sanctuary within the Nishorgo Support 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 Rapid Rural Appraisal RRA and PRA tools, like trend and seasonal analysis, ven 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 115 settlements (villages), locally called paras, having varied degree of stakes with Teknaf GR have been identified, of which 46% paras are located inside or at the boundary and the rest are located adjacent and outside of the GR. About 70% villages have major and the rest have moderate to minor stakes with the GR. Except, the HHs in 33 outside village, the total number of HHs within and around the GR is about 19617 and a population of 119950. Tonchoinga community has about 500 HHs.
3. Based on resource exploitation, a total of 29 stakeholder groups have been identified in the GR area, of them 22 are primary stakeholders and are involved directly in resource extraction and forest conversion activities, and the rest are secondary stakeholders. Of them, 4 SH groups (fuelwood collector, illegal timber feller, betel vine cultivator and brickfield owner) have major stakes with the GR, while 7 have moderate and the rest have minor or negligible level of stakes. Demographically, the SH have also categorized and fall into 13 categories. Of them five SH groups (Tongchoinga/ Tribal, Rohingya, forest villagers, local poor people, farmer) have a major stake with the GR and contribute most to forest degradation. The middle class and rich people have little direct role in exploiting resources from the forest, however, they have a strong role in land encroachment and so as with the local elites, political leaders. Local community organization and other government and non-government organizations have varying degrees of stakes with the forest.
4. Transect walk revealed that the most of the forest hills are denuded and have changed into a savanna type of forest, dominated by herbs and shrubs. As revealed by trend analysis, in Teknaf GR, the forest cover has decreased by more than 60% compared to pre-liberation period. The forest thickness and abundance of tall trees have decreased approx. by 80%, and 90% respectively. On the other hand, the abundance of herbs and shrubs has increased by about 60% and sungrass has increased by about 80%. Indigenous bamboo now remains only by

about 10% compared to pre-liberation period. Hunting and illegal tree felling although increased during 85-99's, have now declined due to its non/or less availability. Abundance of major wildlife has also decreased by more than 80%. The abundance of fruit bearing trees has also decreased by about 95%.

5. There have been corresponding changes in the intensities of resource extraction activities. As revealed by trend analysis, compared to pre-liberation period, illegal timber felling and fuelwood collection have increased by about 40% and 60% respectively. However, illegal tree felling activity slowed down remarkably during 80's and early 90's, but again increased after mid 90's. Fuelwood collection has increased compared to 1985 while hunting of wild animals has decreased due its unavailability and Collection of wild bamboo has decreased by about 80%,. Collection of sun grass has however increased during 80's due to large scale land claim for plantations and the activity has slightly declined now, as many bed have converted to plantations. Hunting of wildlife has also decreased by more than 90% mainly due to serious decline in the availability of wildlife. Fuelwood collection increased, while bamboo collection decreased compared to 1985. Betel leaf cultivation has flourished since 80's. Agricultural activities have also increased. Land encroachment has increased by about 80% compared to 1970 level.
6. Many wildlife species have now become locally extinct including Bengal tiger, goyal, vulture, samba deer, small monkey, leopard, wild cow, shrew, dhanesh, peacock etc. In addition, many species are locally endangered, such as barking deer (critically endangered), bear, fishing cat, wild dog, python, cobra, pangolin, wild fowl, turtle etc. On the other hand, some of the plant species have also become locally extinct viz. chandon, pitraj, tandul, while many species have also become endangered, such as mainly telsur, chapalish, bailum, gamari, teak, urium, Several fruits bearing trees, arjun, bohera, hortoki, cane, natural muli bamboo etc.
7. About 18 different types of resource are extracted from Teknaf GR. The major resources that are exploited on a large and moderate scale are timber (illegal), fuelwood, bamboo, sungrass, sand stone, house building materials etc. Minor resources collected are vegetables, fruits, vines, fodder, wild boar, jungle fowl, fish, green and dry leaves, etc. and rest three are collected on a very negligible scale. The main purposes for resource extraction are meeting HH needs, selling for added income and/or to support and supplement livelihood. These activities are seen to be posing threats to the forest and have a huge impact on forest regeneration and local biodiversity.
8. Extraction of resources from the forest is season dependant. Most of the timber illegally felled during the rainy season as forest patrol is poor during that period. However, collection of house-building materials takes place during the dry season. Fuel wood is mainly collected during dry season due to easy accessibility and mobility inside the forest. Bamboo and sungrass extraction mainly take place

in drier months that corresponds to local needs for house building. Medicinal plants, vegetables and some other forest resources are extracted to some extent mainly during rainy season. A little amount of honey is also extracted during summer. The Tongchoinga and Rakhain tribes hunt wild boar and other animals during the paddy-harvesting period.

9. The major direct causes for the forest degradation in order of magnitude are as follows: land encroachment and expansion of settlements, fuelwood collection, illegal timber felling, expansion of Rohingas settlements, Forest Department's (FD's) plantation practices, betel leaf cultivation, operation of brickfields, Jhum cultivation. The prevailing extreme poverty in the locality, unemployment, coupled with weak law enforcement have made poor local people become reliant on the forest resources for meeting HH needs and added income. Fuelwood collection has also been linked to development of transportation system and marketing opportunities. Local scarcity of these resources is also an underlying cause for dependence on forest resources.
10. FD's poor forest patrol, inadequate manpower of the FD, poor law and order situation and the emergence of increased numbers of locally influential people are all contributing to illegal timber felling. There are conflicts between the FD local staff and the illegal timber fellers, sometimes leads to exchanges of fire. Excessive forest cases lodged by the FD are also driving the people to increased timber felling. While there have been large number of forest cases in the past, recently the trend has declined.
11. Fuelwood requirements of all inside HHs and at least partial demand of HHs in adjacent villages are met from the forest. Besides, fuel wood collection provides primary and secondary occupation for many HHS. The livelihood of many Chakma HHs largely depend on fuel wood selling. A huge amount of fuel wood is used in local brickfields and substantial quantity of fuelwood is transported to other areas. Fuel wood collection is mainly done in the dry season. This poses a threat to the forest and its biodiversity. As per local people approximately 5 to 10% HHs of the area are totally dependent on fuelwood collection
12. FD's plantations strategy is seen as one of the major causes for forest and biodiversity degradation. The plantation is targeted on production forestry, biodiversity conservation has not been considered. In addition to high valued timber trees, the forest is planted with exotic trees, sometimes as a monoculture. The plantation practices include clearing, burning and weeding of the planted areas and thus have contributed to biodiversity and habitat loss for wildlife.
13. Betel leaf cultivation is a huge activity within Teknaf GR and presently, it is the main form of land encroachment and emerged as a good source for added income. As per local people perception, about 90% households of western side of the GR are involved with betel leaf cultivation and most of it are located within the GR. Many HHs completely depend on it, while others supplement their income. All

categories of people, from reach to poor, including local people and forest villagers, Chakma, Rohingya and even some outsiders undertake this activity. The cultivation process involves clearing and burning of the area, fencing and shading the yard. All the raw materials for these come from the forest and thus it has an adverse impact on the forest biodiversity.

14. Most of the people (70%) in and around the GR are very poor, 19% are poor followed by middle class (10%) and upper middle class/rich (1%). As per HH interview: 50% of the households are totally landless. A 50% HHs have homestead land of their own and on the other hand, only 40% HHs have their own agricultural land. This picture in the tribal community is different, with about 90% of HHs poor or extreme poor, and the rest belong to middle class and very negligible percentage of them are rich. . It was reflected from HHs interview that agriculture is the main income source of 53% of household, followed by fishing and shrimp collection (30%), day labourers (10%) and others (7%). On the other hand 57% household has no secondary source of income, betel leaf cultivation (33%), day labourer (30%), fishing (30%) and others (7%).
15. As reflected from HH interview, the main occupation of HH heads of the locality is cultivation (50%), (mainly paddy cultivation, Jhum and betel leaf cultivation), followed by fishing in sea (including shrimp fry collection) (30%), day labor (5%), small business (10%), others (5%). The occupational pattern of the east and west sides of the GR is somewhat different. In the west side, majority people are dependent on the sea and betel leaf cultivation, forest extraction and while in the east side they mainly depend on agriculture and forest use. On an average, about 15% people of the area are unemployed, although this figure varies depending on seasons, being most in Boishak, Jaista and Ashar. As revealed by HH interview, about 82% people are illiterate, which varies greatly between the people between east and west sides, being most in the west side. However, presently, most of the children of the area go to schools.
16. The local power structure remains a crucial issue to the management of the GR. A total of 61 influential persons, local public representatives, have been identified in the locality and many of them have control over the local people, their activities and even over local administration. Some of them have linkages with the illegal tree feller. Information on their domain of power has been collected. It was reported by the local people that many influential persons have access to powerful political leaders, MP and Ministers. Some of the most influential persons are Minister Mr. Salauddin, Mohammed Sajahan MP, Ex MP Mohammad Ali, Chairman of Teknaf union Mr. Jafar member, Ex-Uupazilla Chairman Mr. Azhar and Teknaf Pourashoa Chairman Abdur Rahman Bodi, Chairman of Whykong Union, Moulana Nur Ahmad, Chairman of Hnilla SK Anwar, Thana BNP secretary SK Anwar etc. The tribal people have a traditional governance system, with community leaders. Forest villagers have also have a governance system of their own, under the leadership of the Headman.

17. There are two ethnic communities, namely, Rakhain and Tongchoinga located within and around the GR. Tongchoinga are settled inside the forest as forest villagers. While Rakhain live adjacent or outside the GR. The Tongchoinga are more dependent on forest than the Rakhain. Tongchoinga are involved with jhum cultivation inside the forest. The Rakhain are mainly involved with fishing in Naf river, betel leaf cultivation and day labor. The rate of literacy among the tribal community is very low, only 20% are literate but now a days 100% of the tribal children go to primary school, although only 5-8% go to High School and only 5% study in colleges. Traditionally, both tribes are involved with hunting of wildlife for their HH consumption.
18. No NGO operates in the western part of the GR. However, there are a number of NGOs in the eastern part of the GR. The major NGOs that operate in the east side are Gonosastha, BRAC, ASA, SHED, SDVR, Grameen bank, Kisholaya, etc. Their main activities are concentrated on IGA and micro-credit, health, education and nutrition etc. Some of them have credit programs exclusively for women. There are also about 21 community organizations (CBOs) which deal with local problems, welfare and cultural activities. These organizations could play a significant role toward the implementation of NSP.
19. Several NGOs and two 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 development, fish culture, poultry, livestock rearing etc. and focused on the women. Skill development activities by the NGOs are limited. Local people, particularly the tribal people, have skills like bamboo basket and mat making, or weaving (e.g. Tongchoinga).
20. The main source of conflict among local people centered on land disputes (over both legal and illegally occupied land), money lending and other financial business, dowry, family matters, livestock grazing, stealing, children matters etc. However, these varies among different communities.. Conflicts are resolved by arbitration by local elites & public representatives (MP, UP chairman, members), or at the Gram Sarker. If the local efforts are not fruitful it may lead to filing cases with the Thana-police or even ending up in the courts.
21. There exist a huge conflict in between local FD and local people, particularly with tree feller from various villages. The other causes of conflict arising with FD are forest and land encroachment, forest cases by local FD staff, and prevention in resource exploitation. Giving any type privilege by local FD to any individual or group especially in the nomination process of headman also arises conflict in-between forest villagers/ local people and FD. The conflict with local people in Hnilla was very severe. Forest beat officer of Moddah Hnilla was killed in one occasion and eventually the beat office of Hnilla had to be shifted to Teknaf. In some of the beats new cause was noticed that created conflict with FD, that is the selection procedures of social forestry partner.

22. In general, women in the area are bit conservative, but has moderate outdoor mobility.. There is discrimination in case of education between male and female, only having 5% literacy among females. Same is the situation with health status of females. However, now a days many local women undertake physical labour outside of their houses.
23. Local Police have substantial stake with the forest. as they patrol in the area and on the highway and enforce the forest protection laws and thus has developed a process of negotiation with the resource extraction group. However BDR play positive role with regard to forest conservation.
24. There are 8 brickfields in and around the GR, owned by very influential people, of which 6 are within the sanctuary area. In an average, each brickfield consumes about 300 maunds of fuelwood everyday during their operation period of 6-8 months. Entire fuelwood are usually come from the reserve, but now they are extending their supply areas to nearby other forests to meet their demands. The operation of these brickfields being carried out violating the Forest Act. The presence of these brickfields has caused huge impact on the sanctuary and still it remains as a major threat to the forest biodiversity.
25. Land encroachment is still an on-going process in Teknaf GR and appears to usual practice by the local people. As per local people and local FD staff, about 25% of total forest land has been encroached. Most land has been encroached by local influential people, forest villagers, tribal community and outsiders It is alleged that some local staff also helped in the land grabbing process. The encroached land has variously been converted to agricultural land, homestead, betel vine yard and others.. Government has also encroached land for constructing UNHCR Refugees Camp, BDR Company Head quarter etc.
26. There are about 350 registered and enlisted forest villagers within the Teknaf GR. However, the actual number would be far more. An estimate by the local people and local FD staff the number claiming to be forest villagers may stand at more than 5000 HHs and many of them are descendant of the forest villagers and are listed by the FD as encroachers. They are mainly involved with land encroachment, fuelwood and building material collection, tree felling, betel leaf cultivation and get other forest products for their HHs needs and supporting their livelihood. However, they have little compliance to forest rules and agreement. They try to maintain a good relationship with the local FD staff.
27. Since the declaration of GR, except legal tree felling, no special management regimes have been undertaken. Traditional forest management practices are in place. There is little effort for the recovery or stopping land grabbing. Unsustainable resource extraction activities have not stopped. This may be attributed partly to local deteriorating law and order situation, lack of skilled and adequate manpower and lack of logistics, also to negotiating arrangement



- between some local FD staff and local people and most importantly lack of management action plan.
28. In spite of Government ban on shifting cultivation, (Jum Chash), the practice is still on inside the Teknaf GR. Traditionally, the ethnic community, Tongachoinga tribe in particular, undertake this activity. This practice of cultivation is predominantly seen in Shilkhali, Hnilla, Roikong and Whykheong area. It is carried out predominately on the steep slopes of the high hills. This cultivation process involves clearing and burning of the forested area and thus destroy the forest biodiversity.
  29. With decreased habitat and shortage of food, human-elephant conflicts are high, particularly during April-May, as they come hunting for food, often rampage the crop fields. In recent years crop damages by elephant has led many people to abandon cultivation. This is a particular concern for local people.
  30. Livestock grazing inside and at the edge of the GR is wide spread and some local people have established their demarcated area for their livestock grazing. It is reported that , particularly in Hnilla, Whykong and some other areas, during the cultivation period the villagers put their livestock on to the forest land. This grazing activity has an adverse effect on the forest regeneration.
  31. Major concerns regarding forest biodiversity conservation and management include land encroachment and expansion of agriculture and settlements, betel leaf cultivation, fuelwood and bamboo collection, illegal tree felling, FD's plantation strategies, local poverty and unemployment, Rohiga's activities, hunting and killing of some wildlife, shifting cultivation (Jhum chas), deteriorating local law and order situation, loose control of FD over the GR.
  32. The challenges for the project include recovery and stopping of encroached land, stopping fuelwood collection and timber felling as livelihood of many local people is dependent on it, reversing FD's plantation strategies, addressing local poverty and unemployment, changing morale of the local FD staff, establishing control over the forest in the face of prevailing poor law and order situation, changes in the traditional habit of jhum cultivation hunting of wildlife etc.

# Acronyms

| <b>Acronym</b> | <b>Detailed name</b>                             |
|----------------|--|
| AGA            | Alternate Income Generating Activities           |
| ARSED          | Association for Rural Socio-Economic Development |
| ASA            | Association for Social Advancement               |
| BDR            | Bangladesh Rifles                                |
| BO             | Beat Office                                      |
| BRAC           | Bangladesh Rural Advancement Committee           |
| BRDB           | Bangladesh Rural Development Board               |
| BREB           | Bangladesh Rural Electrification Board           |
| CBO            | Community Based Organization                     |
| CODEC          | Community Development Centre                     |
| Dept.          | Department                                       |
| DFO            | Divisional Forest Officer                        |
| FD             | Forest Department                                |
| FGD            | Focus Group Discussion                           |
| Fig.           | Figure   |
| FRMP           | Forest Resource Management Plan                  |
| FSP            | Forestry Sector Project                          |
| GD             | Group Discussion                                 |
| Govt.          | Government                                       |
| GR             | Game Reserve                                     |
| HHs            | Households                                       |
| IGA            | Income generating Activities                     |
| Int.           | Interview  |
| IRG            | International Resource Group                     |
| kg             | Kilogram   |
| KI             | Key Informant Interview                          |
| LGED           | Local Government Engineering Department          |
| Mat.           | Material   |
| MP             | Member of Parliament                             |
| NACOM          | Nature Conservation Management                   |
| NGO            | Non Government Organization                      |
| NP             | National Park                                    |
| PA             | Protected Area                                   |
| PDB            | Power Development Board                          |
| PRA            | Participatory Rural Appraisal                    |
| RDRS           | Rangpur Dinajpur Rural Development Society       |
| RO             | Range Office                                     |
| RRA            | Rapid Rural Appraisal                            |
| SH             | Stakeholder                                      |
| TE             | Tea Estate                                       |
| Tk.            | Taka   |
| UNHCR          | United Nations High Commissioner for Refugees    |
| UP             | Union Parishad                                   |

# 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 forest, 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 government's 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 Nishorgo Support Project (NSP). Initially NSP is working in five protected area pilot sites, including the Teknaf Game Reserve.

The Nishorgo Support Project (NSP) 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 develop, promote and implement forest co-management model, to halt and/or reverse degrading trend in forest 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 NSP and Logical Basis for Conducting PRA/RRA

For any project, development or research, information is 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 that NSP 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 NSP 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 NSP 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 conducted in Teknaf GR during May-July, 2004. The report also details the methodology and tools used and highlight the issues in forest management and biodiversity conservation and identify the challenges for the NSP. Finally the report makes suggestions on what the project and Forest Department need to do immediately. Finally, the report puts forward set of recommendations for the improved management of the GR.

### **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 NSP 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 NSP, an extended section based on PRA/RRA outcomes, identifying present issues of concern and challenges for NSP and highlights the opportunities for the project.

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

## 2. DESCRIPTION OF THE PROJECT SITE

The Teknaf Game Reserve (GR) is situated in the Teknaf peninsula in the southeastern parts of Bangladesh and bordered on the east by Naf River and on the west by the Bay of Bengal. The northern end of Teknaf GR lies some 48 km south of Cox's Bazaar District Headquarters. The Reserve measures roughly about 28 km north-south and 3-5 km east west and lies in between 20<sup>0</sup>52' – 21<sup>0</sup>09' N and 92<sup>0</sup>08' – 92<sup>0</sup>18' E. The reserve includes 5 unions of Teknaf Upazila, namely, Baharchara, Hnilla, Sabrang, Teknaf and Whykong and part of Zaliapalong Union of Ukhia Upazila of the Cox's Bazaar district. A metalloid road runs along the entire eastern length of the forest from north to south. Several other earthen and brick soled roads traverse the forest from east to west.

The forest is under the jurisdiction of Cox's Bazaar South Forest Division, divided into 3 forest ranges (i.e Teknaf, Shilkhali and Whykong) and further subdivided into 11 forest beats. The forest has 11 forest blocks.

Teknaf GR is a part of the former Teknaf Reserved Forest, and was formally established through a gazette notification in 1983. The GR covers an approx. area of 11,615 ha. It includes an area formerly referred to as the Thainkhali Game Reserve (7,770 ha).

Topographically, the GR consists of the hilly range that forms the backbone of the narrow peninsula. The range runs along north-south direction and parts of the range reach an altitude as high as about 700 m from the sea level. The soil consists of primarily of clay to clay loam on level grounds and from sandy loam to coarse sand on hilly lands. The clay and loams are highly fertile and have developed under forest and thickets, often having a thin layer of warm cast over the surface. Topsoil is dark grayish, brown to dark brown, sandy loam to loam, moderately granular to crumbs. Some sandy soils contain a hard concretionary or indurate lateritic layer at variable depths.

The terrain of the Teknaf GR is exceedingly irregular and slopes are often precipitous. In some sections, the hills abut directly on to the sea beach along the western boundary. Deep gullies and narrow valleys are found in the area, drained by numerous streams that flow down to the Naf towards east and the Bay of Bengal towards the west. The streams are very shallow and only few of them are subject to the influence of tidal waters. Most



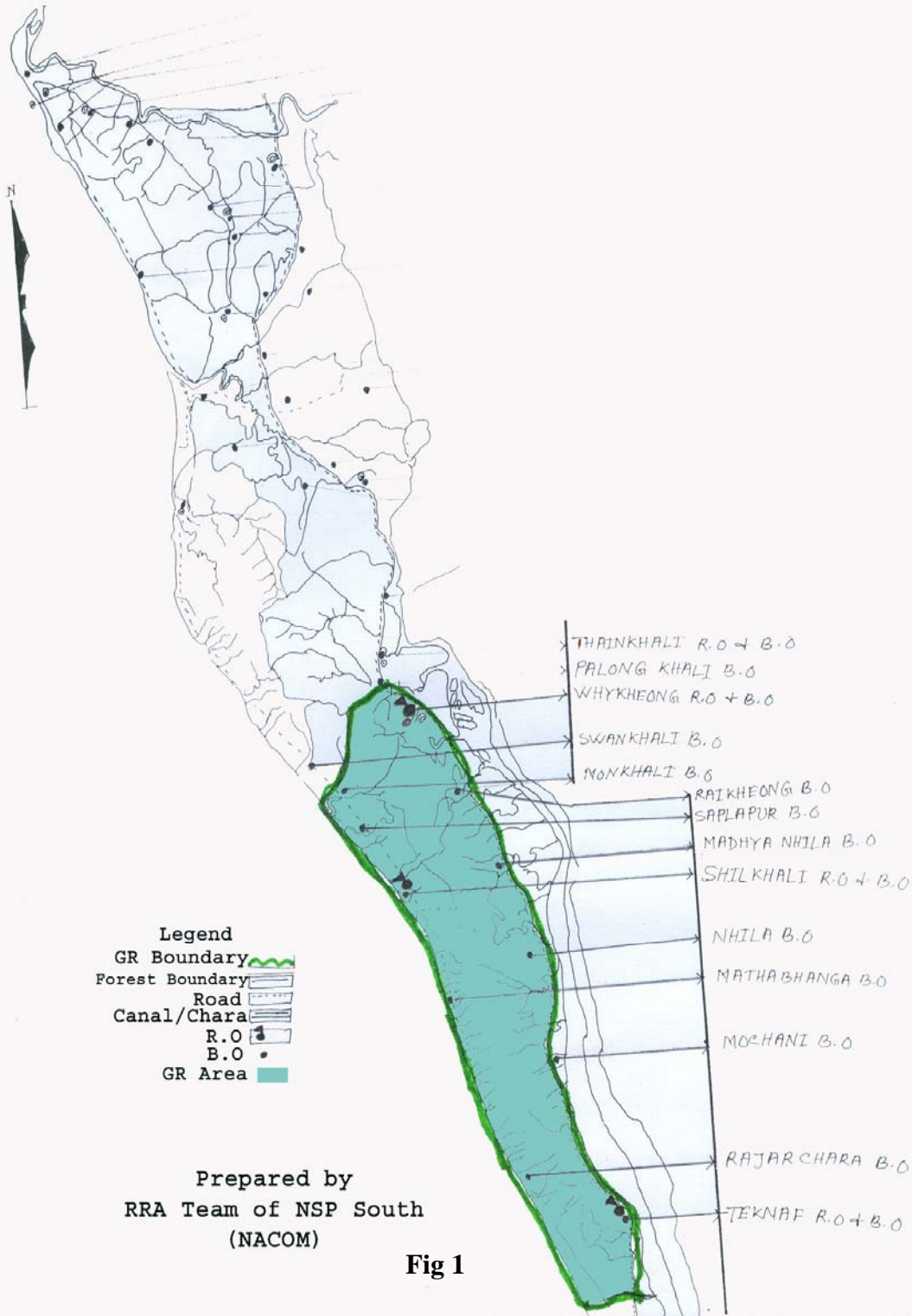
of the streams are seasonal, discharging water during monsoon and dry up or flow feebly during dry months.

The Teknaf GR has been broadly classified as the tropical evergreen or semi-evergreen forest the vegetation of the reserve originally consisted of tall mixed evergreen trees which primarily occurred in deep valleys and shaded slopes, dominated by unique garjan trees. Now, the hills are mainly denuded, dominated by sungrass, herbs and shrubs and brushwood. A survey in forest shows that about 600 plant species still inhabit the forest.

The land use pattern is varied and wide. These are natural and planted forests, agriculture, housing, livestock and fisheries. An estimate shows that forest area covers 42.1%, rivers 0.4%, cultivated area 46.5%, permanent crop 4.5%. The recent development is the cultivation of betel leaf in a substantial area.

# Map of Teknaf Game Reserve (Shaded) Cox's Bazar South Forest Division

( Not to Scale)



### 3. METHODOLOGY

As mentioned in the preceding section that a two-step rapid appraisal strategy was taken. RRA was conducted as the first and initial step in the appraisal process, followed by PRA. The overall purpose of the RRA and PRA was to come up with a comprehensive situational analysis of the Teknaf Game Reserve with a view to understand: -

- Who destroys and how the forest is destroyed
- What are the underlying driving force for the forest degradation
- Cause and effect of behavior of local people
- Opportunities for its improvement

While RRA was designed to identify the stakeholder groups and to get a sense of range of issues that the project needs to address and be better informed during subsequent appraisals and surveys, PRA was planned to collect in-depth information on the identified issues.

#### 3.1 Study Period

RRA and PRA field exercises in Teknaf Game Reserve were conducted during 12<sup>th</sup> May to 15<sup>th</sup> May 2004 and 20<sup>th</sup> June to 28<sup>th</sup> June 2004, respectively and the detail time schedule for the field activities is given in Table 1 & 2.

**Table 1. List of selected RRA spots & Schedule for visits**

| <b>Proposed Date</b> | <b>Site: Teknaf Game Reserve<br/>Name of spots (villages)</b> | <b>Remarks</b>                              |
|----------------------|---|---|
| 11/05/2004           | Orientation and briefing at Cox's Bazaar                      | Team arrives the day before.                |
| 12/05/2004           | Saplapur and adjacent villages                                | Team stay at Teknaf and Inani FD Rest House |
| 13/05/2004           | Jahazpura and adjacent villages                               |   |
| 14/05/2004           | Adjacent villages nearby Hnilla range office                  |   |
| 15/05/2004           | Roikhong and adjacent villages                                |   |

**Table 2. PRA spots and schedule for conducting field activities**

| <b>Date</b>                        | <b>Beat</b> | <b>Village/location</b>                  | <b>Performed activities</b>   | <b>Remarks</b>  |
|------------------------------------|-------------|--|---|---|
| 21/6/2004-                         | Monkhali    | Chammapara                               | HH Interview (5)  | Tongchoinga HHs head  |
|                                    |             |  | FGD (1)   | Tongchoinga community   |
|                                    | Shamlapur   | Rohingapara (Hazi salam colony)          | FGD(1)  | Rohinga migrants  |
| Jumpara, Puran paras, Bazaar para, |             | Transect, GD (1)<br><br>HH interview (5) | Inside the GR, GD with community people to know about land encroachment, local governance system, illegal timber feeling and forest dynamics. |   |
| 22/6/2004                          | Shamlapur   | Bazaar, Notun para                       | FGD (1)<br>HH interview (5)   | Fuel wood collectors  |
|                                    |             | Montolia para,                           | GD (1)  | GD with community people to know about land encroachment, local governance system illegal timber felling and forest dynamics. |
|                                    |             | Bazaar                                   | FGD (1), Mapping  | Betel leaf cultivator, Prepared Participatory social and resource mapping.  |
| ^^^                                |             | Jumpara                                  | FGD (1)<br><br>KI (1)   | FGD with Forest villagers, FD staffs about forest management, plantation strategies, land encroachment. Headman               |
| 23/6/2004                          | Shilkhali   | Holbunia                                 | FGD<br><br>HH interview (2)   | FGD with women to learn about gender issues. Local HHS head   |
|                                    |             | Jahajpura garjan garden                  | Transect  | Across the settlements and inside the forest  |
|                                    |             | Jahajpura,                               | Mapping<br><br>HH interview (3)   | Prepared participatory social and resource mapping of Shilkhali beat.   |
|                                    |             | Jahajpura bazaar,                        | FGD   | FGD with Furniture shop owner and tea stall owner to know about timber and fuelwood consumption.                              |

| Date      | Beat       | Village/location           | Performed activities             | Remarks  |
|-----------|------------|----------------------------|----------------------------------|--|
|           |            | Kader para                 | FGD                              | FGD with local government members and local elites to know about social and forest dynamics, local governance system and community structure and functions                               |
|           |            | Miar para                  | Transect                         | Inside the GR  |
|           |            | Beat office                | FGD                              | FGD with FD staffs to know about the land encroachment and forest management regimes including plantation strategy   |
|           |            | Mathpara                   | FGD                              | FGD with forest villagers.   |
|           |            | Jahajpura bazaar,          | GD,<br>FGD<br><br>KI             | One GD was conducted in near by Jahajpura Bazaar to know about the overall issues of the area and forest situation and grazing, FGD with ethnic community.<br>Local Union parisad member |
| 24/6/2004 | Mathabanga | Marishbunia bazaar         | FGD<br>GD<br><br>Mapping         | FGD with FD staffs.<br>GD with community people to know the overall situation of the area.<br>Prepared participatory resource and social mapping.  |
|           |            | Bordail                    | FGD, GD<br><br>HHs Interview (2) | FGD with forest villagers, One GD was conducted with the teachers of Marishbunia Junior High School.   |
|           |            | Kachhapia                  | FGD,<br>KI<br>HHs Interview (3)  | FGD with Betel leaf cultivator<br>Local govt. member   |
| 25/6/2004 | Teknaf     | Keruntoli                  | FGD<br>GD (1)                    | FGD with fuel wood collectors<br>GD with tea stall and hotel owner and workers,  |
|           |            | Boroitoli,<br>Naithongpara | FGD (5)<br>HHs Interview (5)     | FGD with bamboo collector,<br>Forest villager, Ethnic community, Betel leaf cultivator, FD stuff about forest management and land encroachment.  |

| Date      | Beat    | Village/location                                 | Performed activities                                      | Remarks  |
|-----------|---------|--|---|--|
|           |         | Lengurbil, Pallanpara                            | GD (1)<br><br>Transect Resource and social mapping, FGD   | GD with local government members and local elite, Inside the GR, Local Community people FGD with women to learn about the gender issue |
|           |         | Naithongpara                                     | GD (1)<br>KI  | Rohinga and local people range Officer, Teknaf   |
| 26/6/2004 | Mochuni | Dhamdhamia, Mochunipara                          | FGD<br>GD<br><br>Transect HHs Interview (3)               | FGD with Forest villagers<br>GD with community people<br><br>Inside the GR   |
|           |         | Uttar ledha, Dakhin ledha,                       | FGD (2)<br>KI   | FGD with fuel wood collectors, FGD with women to learn about the gender issues.<br>Local government member                             |
|           |         | Ledha puchinga para, Rongikhali ALikhali         | FGD (3), GD   | Betel leaf cultivator, Brickfield owners, Ethnic community, GD with FD staffs  |
|           |         | Ledha Lamarpara                                  | Mapping   | Prepared resource and social mapping with local people.  |
|           |         | Mochunipara                                      | FGD (2)   | FGD with bamboo and sun grass collector,   |
|           |         | SMP office                                       | KI  | About SMP and eco-park   |
|           |         | Beat office                                      | GD<br>Transect  | GD with FD staffs<br>Inside the GR   |
| 27/6/2004 | Hnilla  | Combonia, Hnilla bazaar                          | FGD (1)<br>Resource and social mapping, HHs Interview (5) | FGD with betel leaf cultivator<br>Local community people<br><br>Local HHs head   |
|           |         | Moulovi bazaar                                   | FGD<br>HHs Interview (5)                                  | FGD with tree feller, Fuelwood collectors,   |
|           |         | Nikhong khali                                    | FGD<br>KI   | FGD with women.<br>Local elite   |
|           |         | Hnilla bazaar, Moheshkhalia para, Satgharia para | GD, FGD   | GD with tea stall owner and workers, Forest villagers about grazing and land encroachment, FGD with ethnic community                   |

| <b>Date</b> | <b>Beat</b>      | <b>Village/location</b>  | <b>Performed activities</b>   | <b>Remarks</b>   |
|-------------|------------------|--|---|--|
| 27/6/2004   | Moidho<br>Hnilla | Noyapara,<br>Jimong khali,<br>Khanjor para,<br><br>Rajargona, Khareng<br>khali | FGD (5),<br>GD(1),<br>Transect,<br>Mapping,<br>HHs interviews<br>(10)<br><br>KI | FGD with forest villagers,<br>Fuelwood collectors, Betel<br>leaf cultivators, Furniture shop<br>owners & Rakhain Tribe<br>community, GD with FD staff<br>about plantation strategy,<br>forest management and land<br>encroachment, with<br>community people for<br>preparing participatory<br>resource and social mapping.<br>Local school Teacher |
| 28/6/2004   | Roikhong         | Unchiprang,<br>Roikhong,<br>Katakhal,<br>Balukhali                             | FGD (5),<br>GD (1),<br>Transect,<br>Mapping,<br>HHs interviews<br>(10)          | FGD with forest villagers,<br>Fuelwood collectors, Betel<br>leaf cultivators, illegal tree<br>feller, Jum cultivator, GD with<br>FD staff about plantation<br>strategy, forest management<br>and land encroachment, with<br>community people for<br>preparing participatory<br>resource and social mapping.  |
| 28/6/2004   | Whykong          | Daingakata,<br>Horikhola,<br>Lombagona,<br>Amtoli, Whykong,<br>Keruntoli       | FGD,<br>GD,<br>Transect,<br>Mapping,<br>HHs interviews<br>(10)                  | FGD with forest villagers,<br>Fuelwood collectors, Betel<br>leaf cultivators, Furniture shop<br>owners, Women to learn about<br>gender issues, FD about<br>plantation strategy, forest<br>management and land<br>encroachment, with<br>community people for<br>preparing participatory<br>resource and social mapping.                             |

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

A interactive and consultative planning workshop was organized on 31<sup>st</sup> March to 1<sup>st</sup> April 2004 at CODEC Training Centre, Chittagong, with a view to identify, prioritize and finalize the RRA issues and questions. Workshop was participated by subject matter specialists and representatives from NACOM, field implementation partners of NSP south (CODEC) and local FD staff, who were likely to be involved in the RRA field exercise process. This workshop provided an opportunity to prepare a field protocol,

decide and agree on, and elaborate approaches, methods and tools to be used and also to make and consolidate team understanding. PRA issues and questions were developed by a 3-membered expert teams on the basis of outcomes of the RRA exercise and field experience from the RRA exercise. The RRA and PRA issues and questions are given in Table 3 and Table 4, respectively.

**Table 3. Selected RRA issues for Teknaf GR, specific activities and tools used**

| Sl. | RRA Issues   | Specific activities   | Tools Used   | Participants  |
|-----|--|---|--|---|
| 1   | Stakeholder Assessment   | Identification of settlements, resource users, local institutions and agencies and organization, community organizations etc and their roles and activities   | HHs<br>Interview,<br>KI<br><br>FGD<br><br>GD<br><br>Sketch mapping | Local HHs<br><br>Local school teacher, Doctor<br>Community people (villagers, elites etc)<br>Local community people<br><br>Local people |
| 2   | SH Demographic profile   | - Settlement wise no. of HHs/population<br>- HH occupation, education, forest use, land holding   | Secondary Info<br><br>HH Int., KI, GD, FGD<br><br>Trend Analysis   | Local union parishad<br><br>HHs heads/members<br>Community people<br>School/College teachers & local public representatives             |
| 3   | SH Economic Activities/<br>Livelihood Strategies and Human Capital Development | - HH primary and secondary income sources of HH<br>- Richness/poverty<br>- Unemployment and its seasonal trend<br>- Credit and alternate income generating opportunities<br>- Skill and skill development opportunities<br>- Seasonal workload of male and female | HH Int.<br>GD<br><br>KI<br><br>FGD<br>Seasonal Calendar            | HHs heads/members<br><br>Teacher, retired officers, old people<br>Public representative   |



| Sl. | RRA Issues                 | Specific activities  | Tools Used   | Participants  |
|-----|----------------------------|--|--|---|
|     |                            |  |  | Local elite<br>Community<br>people<br>Forest villagers  |
| 4   | Gender Issues              | <ul style="list-style-type: none"> <li>- General impression on living standard, education and health status etc.</li> <li>- Participation in decision making (household and PA management)</li> <li>- Women mobility in the area</li> <li>- Access to IGA and credit etc</li> </ul>  | HH Int.<br>GD<br>FGD<br>KI,<br>Direct<br>observation                               | HHs heads<br>Women group<br>Community<br>people<br>Local elites<br><br>RRA team<br>members.   |
| 5   | Behavior of local people   | <ul style="list-style-type: none"> <li>- Initial response of the local people and FD staff towards the project</li> <li>- Sources of conflict and conflict resolution</li> </ul>   | FGD<br>GD<br>HH int  | Local<br>community<br>FD staff<br>HHs heads   |
| 6   | Local Level Awareness      | <ul style="list-style-type: none"> <li>- Awareness and perceptions about resource degradation and conservation</li> <li>- Willingness for resource conservation</li> <li>- Awareness about the existence of nearby park/game reserve and reserved forest</li> <li>- Knowledge about forest and wildlife preservation acts</li> </ul>   | HH int<br><br>GD<br><br>FGD  | Local HHs<br>heads<br><br>Local<br>community &<br>Rohinga<br><br>FD staff   |
| 7   | Resources /resource status | <ul style="list-style-type: none"> <li>- Trend in changes in major resource bases</li> <li>- Endangered/extinct plant and animals</li> <li>- Causes for the decline in different resources</li> </ul>  | Trend<br>analysis,<br>HH int,<br>FGD<br>GD<br>KI                                   | Local people/FD<br>staff<br><br>Local HHs<br>heads<br>FD staff<br>Community<br>people Local<br>educated old,                          |
| 8   | Resource exploitation      | <ul style="list-style-type: none"> <li>- Major forest resources collected, including NTFPs:</li> <li>- Reasons and extent of exploitation of different forest resources</li> <li>- Dependency on the forest/forest products</li> <li>- Seasonal trend in resource exploitation</li> <li>- Future risks</li> <li>- Medicinal plant uses and reason for not using these</li> </ul> | HH int,<br>FGD,<br><br>GD<br>KI,<br><br>Trend<br>analysis,<br>seasonal<br>calendar | Local HHs<br>heads<br>Public<br>representatives<br>& FD staff<br>Community<br>people<br>Local educated<br>old,<br><br>Local elite and |

| Sl. | RRA Issues                      | Specific activities  | Tools Used  | Participants  |
|-----|---------------------------------|--|---|---|
|     |                                 |  |   | FD staff<br>HHs interview<br>and KI   |
| 9   | Resource regeneration practices | <ul style="list-style-type: none"> <li>- Plantation status in the locality</li> <li>- Problem with natural regeneration in the forest</li> <li>- Plant nursery</li> <li>- General land use pattern in the buffer zone</li> <li>- Major agricultural crop</li> <li>- Seasonal pattern in agriculture</li> </ul>                 | Secondary Information<br>,<br>FGD,<br>GD,<br>KI,<br><br>Seasonal calendar | Secondary data from FD<br>FD staff<br>Community people<br>Local elite,<br>teacher<br><br>Community people   |
| 10  | Legal aspects                   | <ul style="list-style-type: none"> <li>- Access to the forest by locals</li> <li>- Forest villagers and land use agreement</li> <li>- Conflict and negotiation with FD staff</li> <li>- Land encroachment/recovery</li> <li>- Law enforcement mechanisms in the PA</li> <li>- Illegal tree felling and forest cases</li> </ul> | FGD<br><br>GD<br><br>KI<br><br>FGD<br><br><br>KI                          | FD staff and forest villagers<br>Local community and local govt. members<br>Local elites<br><br>FD staff, community people<br><br>Teacher, ex-officers, |
| 11  | Power structure                 | <ul style="list-style-type: none"> <li>- Local influential and their role, local hierarchy</li> <li>- Nature and sources of power and their domain of influence</li> <li>- Conflict and conflict resolution</li> <li>- Social cohesion and adhesion</li> </ul>   | HH int,<br><br>FGD,<br><br>GD,<br><br>KI                                  | Local HHs heads<br><br>Local community and local govt.<br>Local community<br><br>Local elites   |
| 12  | Others                          | <ul style="list-style-type: none"> <li>- Access to areas and settlements</li> <li>- NGO activities in the locality</li> <li>- Challenges for conservation</li> <li>- Local problems</li> <li>- Mobility in the area</li> </ul>   | HH int,<br>FGD,<br><br>GD,<br><br>KI                                      | HHs heads<br>Local community and local govt.<br>Local people & FD staff<br>Local elites   |

**Table 4. PRA issues, specific activities performed and tools used in Teknaf GR**

| Sl. | Issues  | Specific activities  | Tools used  | Participants  |
|-----|---|--|---|---|
| 1   | Forest make up dynamics                                       | <ul style="list-style-type: none"> <li>-observation on forest physiographic and topography and forest make up</li> <li>-land use cover, resource exploitation and regeneration areas, animal distribution</li> <li>-changes in forest cover, thickness, vegetation, settlements, animals and availability of resources</li> </ul>  | <p>Transect walk<br/>KI</p> <p>Resource mapping<br/>Secondary data, FGD, KI</p> <p>Trend analysis</p>           | <p>PRA Team<br/>Local elite, FD staff</p> <p>FD staff and village headman, forest villagers.</p> <p>Local people and FD staff, forest villagers</p> |
| 2   | Local governance system and community structure and functions | <ul style="list-style-type: none"> <li>- Decision makers--- influential people</li> <li>- Local community organizations and institutions and their linkages</li> <li>- Local conflict and conflict resolution</li> <li>- Social cohesion and adhesion</li> <li>- Collective action</li> <li>- Local problem, cause and possible solution</li> </ul>  | <p>Venn diagram</p> <p>Ven diagram</p> <p>Venn diagram</p> <p>FGD/GD</p> <p>FGD &amp; GD and Ranking</p>        | <p>Community people<br/>Community</p> <p>As above</p> <p>As above and local elite</p>   |
| 3   | Livelihood strategies   | Income and expenditure sources, Livestock, Richness and poverty  | Wealth ranking<br>HH interview  | Women group and local people  |
| 4   | Gender issue  | <ul style="list-style-type: none"> <li>- Family decision making</li> <li>- mobility</li> <li>- workload</li> <li>- Education and access to credit</li> </ul>   | <p>Decision making Chart</p> <p>Mobility map</p> <p>Daily and seasonal work chart</p> <p>HHs Int. &amp; FGD</p> | <p>Women group</p> <p>Women group</p> <p>Women group</p> <p>Women and local educated people</p>   |
| 5   | Fuel wood collection  | <ul style="list-style-type: none"> <li>- Information on collector</li> <li>- Purpose and driving force for collection</li> <li>- Dependence on the extraction for their livelihood and its extent</li> <li>- Uses and marketing channel of the resource</li> <li>- Level of extraction and seasonality</li> <li>- Conflict with FD or other people over the extraction</li> <li>- Negotiation for carrying out the activity</li> <li>- Alternate source for the collection of the</li> </ul> | FGD & GD, seasonal analysis   | Fuel wood collector, community people, local hotel and tea stall owners   |

| Sl. | Issues                                    | Specific activities  | Tools used   | Participants   |
|-----|---|--|--|--|
|     |   | <ul style="list-style-type: none"> <li>resources</li> <li>- Needs and expectation of the collector</li> <li>- Impact on the forest and future risks for the collector</li> </ul>   |  |  |
| 6   | Illegal timber felling                    | <ul style="list-style-type: none"> <li>- Information collector</li> <li>- key people behind the activity and network</li> <li>- Purpose and driving force for collection</li> <li>- uses and marketing channels and dependence</li> <li>- What encourages them to take up the activity</li> <li>- Anybody protect them, if they are in problem</li> <li>- Protection by FD or by any other agencies (e.g. Police etc.)</li> <li>- conflict and negotiation with FD or other people</li> <li>- needs and expectation of the feller</li> <li>- impact on the forest and future risks for the illegal feller</li> <li>- Seasonality and trend in timber extraction</li> </ul> | FGD, GD and KI<br><br><br><br><br><br><br><br><br><br><br><br>Seasonal calendar and trend analysis | Illegal timber feller, FD staff and community people, teacher and local elite  |
| 7   | Collection of trees as building materials | <ul style="list-style-type: none"> <li>- Information on collector</li> <li>- purpose and reasons for collection</li> <li>- uses of the resource and extent of extraction</li> <li>- dependence on the extraction and marketing</li> <li>- conflict and negotiation with FD or other people over the extraction</li> <li>- alternate source for the collection of the resources</li> <li>- needs and expectation of the collector</li> <li>- impact on the forest and future risk for the collector</li> </ul>  | FGD, GD and KI   | Community people, FD staff , , forest villagers, local public representative and elite   |
| 8   | Bamboo and cane collection                | <ul style="list-style-type: none"> <li>- Information on collector</li> <li>- purpose and reasons for collection</li> <li>- uses of the resource and extent of extraction</li> <li>- dependence on the extraction and marketing</li> <li>- conflict and negotiation with FD or other people over the extraction</li> <li>- alternate source for the resources</li> <li>- needs and expectation of the collector</li> <li>- impact on the forest and future risk for the</li> <li>- seasonal changes and trend in abundance</li> </ul>   | FGD, GD<br><br><br><br><br><br><br><br><br><br><br><br>Seasonal calendar and trend analysis        | Bamboo and cane collector, community, people and FD staff<br><br><br><br><br><br><br><br><br><br><br><br>Bamboo collector and local people |
| 9   | Information on Forest villagers           | <ul style="list-style-type: none"> <li>- Distribution of forest villager's settlements</li> </ul>  | FGD  | Forest villagers and FD staff  |

| Sl. | Issues                 | Specific activities  | Tools used  | Participants  |
|-----|------------------------|--|---|---|
|     |                        | <ul style="list-style-type: none"> <li>- Registered and actual number of forest villagers</li> <li>- compliances to FD agreement</li> <li>- Present economic activities</li> <li>- Resources exploitation and dependence on forest resources</li> <li>- land encroachment by the forest villagers or by their dependant</li> <li>- relationship and conflict with FD</li> <li>- internal governance system</li> <li>- needs and expectation</li> </ul>               | Secondary data  | FDs villagers register  |
| 10  | Betel leaf cultivation | <ul style="list-style-type: none"> <li>- distribution of betel vine yards within and approximation of its number</li> <li>- historical perspective of flourishing the activity in the area</li> <li>- information on cultivator</li> <li>- ownership of land</li> <li>- dependence on the activity</li> <li>- Impact on the forest resources</li> <li>- Conflict with FD</li> </ul>  | FGD<br>GD<br>GD   | Betel leaf cultivator<br>FD staff<br>Local community  |
| 11  | Land encroachment      | <ul style="list-style-type: none"> <li>- Historical perspective and trend</li> <li>- information on encroaches and reason for encroachment and what drives to undertake the activity</li> <li>- Legalization of process</li> <li>- Conflicts and negotiation process</li> <li>- Uses and transformation of encroached land</li> <li>- Local mechanisms/system or traditional practice for land encroachment</li> </ul>   | Secondary data and trend analysis<br>FGD and KI             | FDs encroacher register<br>Encroacher Group and FD staff, local elite And community people            |
| 12  | Livestock Grazing      | <ul style="list-style-type: none"> <li>- Identification of grazing area</li> <li>- types and No. of livestock</li> <li>- who owns the livestock</li> <li>- mention whether seasonal and all time</li> <li>- alternative areas for grazing</li> </ul>   | HH Int.<br>FGD<br>GD<br>Transect                            | Local HHs heads<br>Livestock owner and community<br>FD<br>Inside GR                                   |
| 13  | Rohinga Issue          | <ul style="list-style-type: none"> <li>- Distribution of Rohingas camp/settlements in and around forest</li> <li>- process of establishing settlements (past and present)</li> <li>- Present economic activities</li> <li>- dependence on the forest resources and impact</li> <li>- relationship with the local people</li> <li>- internal governance system</li> <li>- Conflicts with FD or other agencies or other local people with the use of forest</li> </ul> | Secondary data and trend analysis<br>FGD and KI<br>HHs Int. | upazilla parisad and Refugees camp<br>FD staff<br>Rohinga and Local Bangali Community<br>Local elites |

| Sl. | Issues                                       | Specific activities   | Tools used  | Participants   |
|-----|--|---|---|--|
|     |  | - needs and expectation   |   |  |
| 14  | Information on the ethnic community          | <ul style="list-style-type: none"> <li>- Distribution of ethnic community settlements in and around forest</li> <li>- probable No. of HH in each settlement</li> <li>- Present economic activities</li> <li>- dependence on the forest resources and impact</li> <li>- land encroachment by them</li> <li>- relationship with the local people or agencies</li> <li>- internal governance system</li> <li>- Conflicts with FD or other agencies or other local people with the use of forest</li> <li>- needs and expectation</li> <li>- reaction to the project</li> </ul> | <ul style="list-style-type: none"> <li>Secondary data and trend analysis</li> <li>FGD and KI</li> <li>HHs Int.</li> </ul> | <ul style="list-style-type: none"> <li>upazilla parisad and Refugees camp</li> <li>FD staff</li> <li>Ethnic community and Local Bangali Community</li> <li>Local elites</li> </ul>     |
| 15  | Information on Brickfield/ Brickfield owners | <ul style="list-style-type: none"> <li>- Nos. and distribution</li> <li>- Owners and their influences</li> <li>- Compliance to forest laws</li> <li>- Period of operation</li> <li>- Sources of fuelwood (from the forest concern or from elsewhere)</li> <li>- Type of fuelwood used</li> <li>- Network of supplies</li> <li>- Approx. quantity used/year</li> <li>- Impact on forest</li> </ul>   | <ul style="list-style-type: none"> <li>Secondary data and trend analysis</li> <li>FGD and KI</li> <li>GD</li> </ul>       | <ul style="list-style-type: none"> <li>from available source</li> <li>Local people, labour of brickfield</li> <li>nearby people brickfield manager/owners</li> <li>FD staff</li> </ul> |
| 16  | Information on Sawmill/ Sawmill owners       | <ul style="list-style-type: none"> <li>- Nos. and distribution</li> <li>- Owners and their influences</li> <li>- Compliance to forest laws</li> <li>- Period of operation</li> <li>- Who brings timber to them</li> <li>- Sources of timber (form the forest concern or from elsewhere-homestead)</li> <li>- How distinction is made between timber from the forest and that from villages</li> <li>- Inspection by FD/or other law enforcing authority</li> <li>- Network of supplies</li> </ul>   | <ul style="list-style-type: none"> <li>Secondary data and trend analysis</li> <li>FGD and KI</li> </ul>                   | <ul style="list-style-type: none"> <li>From available source</li> <li>Local people, labour of sawmills</li> <li>FD staff</li> <li>nearby people sawmills manager/owners</li> </ul>     |

### 3.3 Formation of RRA and PRA Field Teams

The RRA field teams were formed with representatives from NACOM, and CODEC and FD local staff, having biological and sociological background. Two separate RRA field teams were formed, each team consisting of 3-4 members. The teams worked

simultaneously in the field, but at different locations .The team make up for the RRA and PRA field exercises are given in Table 5 & 6.

**Table 5. RRA Team for Teknaf GR**

| <b>RRA Team composition</b>      |                            |                                  |                            |
|----------------------------------|----------------------------|----------------------------------|----------------------------|
| <b>Team 1</b>                    |                            | <b>Team 2</b>                    |                            |
| <b>Name</b>                      | <b>Duties/Organization</b> | <b>Name</b>                      | <b>Duties/Organization</b> |
| Mrs. Rasheda Khanom              | Team Leader, CODEC         | Mrs. JK Shahana                  | Team Leader, NACOM         |
| Mr. Safiqur Rahman               | Report Writing, NACOM      | Mr. Mahbubur Rahman              | Report Writing, NACOM      |
| Mr. Nazmul Abedin                | CODEC                      | Kazi Saifuzzaman                 | CODEC                      |
| Mr. Moazzem Hossain / any other. | FD                         | Mr. Hanif Khan                   | CODEC                      |
|                                  |                            | Mr. Mominul Hoque / or any other | FD                         |

**Table 6. PRA Team for Teknaf GR**

| <b>PRA Team composition</b> |  |                     |   |                   |                              |
|-----------------------------|--|---------------------|---|-------------------|------------------------------|
| <b>Team 1</b>               |  | <b>Team 2</b>       |   | <b>Team 3</b>     |                              |
| <b>Name</b>                 | <b>Duties/Organization</b>   | <b>Name</b>         | <b>Duties/Organization</b>                        | <b>Name</b>       | <b>Duties/Organization</b>   |
| Mr. Safiqur Rahman          | Transect, Socilal and resource mapping, FD management regimes and plantation NACOM | Mr. Mahbubur Rahman | FGD, GD and KI with different stakeholders, NACOM | Mrs. JK Shahana   | HHs Interview, Formats NACOM |
| Mr. Nazmul Abedin           | CODEC  | Mr. Hanif Khan      | CODEC   | Kazi Saifuzza man | CODEC                        |

### **3.4 Selection of RRA and PRA Spots**

On the basis of information provided by the FD local officials and staff and field implementing NGO (CODEC)’s various sample locations were selected for visits by the teams 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. A list of the selected RRA and PRA spots for Teknaf GR is given in the above-mentioned Table 1 & 2.

### **3.5 Holding Training Workshop**

A one-day training workshop was organized for the RRA team members on 10<sup>th</sup> May 2004. A similar workshop was also held for PRA on 19<sup>th</sup> June the purpose was to give the RRA and PRA field team instructions in using various tools. The workshop was held at the CODEC Training Centre, Chittagong and NSP field office, Cox/s Bazaar, on RRA and PRA, respectively.

### **3.6 Choice of RRA and PRA Methods and Tools**

The RRA and PRA methods and tools to be used for generation of information were selected, elaborated and detailed in the planning workshop. The type and nature of issues, accessibility and mobility in the area, behavior of local people and rapport of the field staff decided appropriateness of these methods and tools with the local people. Various techniques and tools used for generating information for various set issues and questions are provided in Table 3 & 4. The detailed methodology for corresponding tools was embodied in manual and used in the training workshop so that the methodology remained same across the team and across the sites. It may be mentioned that a particular tool was not exclusive for a particular issue, rather a tool was used for a number of issues. Similarly, a particular information was sought by a number of techniques and tools and thus provided an opportunity for triangulation for deciding on the acceptance of a particular information.

RRA was mainly based on the unstructured and semi-structured HH interviews, group and focal group discussions and also used some limited number of other RRA tools, like trend analysis, seasonality's, sketch mapping etc. However, in addition to focus group and group discussion, various PRA tools, like Venn diagramming, resource mapping, seasonality's, trend analysis, Livelihood analysis etc., were used during PRA exercises.

**Matrix covered under various PRA tools are given below:**

#### **i. Venn diagramming**



Local power structure, local community organizations, local institutions and agencies, local conflict and conflict resolution, family decision making, Mobility Women & men  
Local NGO/CBOs

#### **ii. 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, sungrass extraction.

#### **iii. 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.

#### **iv. Ranking and scoring**

Local problem ranking, wealth ranking, and livelihood analysis

#### **v. Transect walk**

Soil, vegetation, land use, elevation, crops, wildlife, human activities etc

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

### **3.7 Field Implementation Strategies for the Selected Tools**

During RRA exercise, a total of 40 HHs interviews, 5 group interviews, 9 key informant interviews, and 5 Focus group discussions were conducted. The other RRA tools were applied during above mentioned interviews and discussions. Similarly, during PRA a total of HH 30 interviews, 10 Group interviews and 19 focus group interviews were

conducted (table-7). The other PRA tools were used either during the above exercise or in separate exercises dedicated for this purpose. The field implementation strategies of various tools used are given below.

**Table 7. Records of performed activities in different beats of Teknaf GR during PRA**

| Range     | Beat             | Village/<br>Settlement<br>covered | FGD | GD | KI | HHs<br>Interview | Transect | Resource<br>and<br>social<br>mapping |
|-----------|------------------|-----------------------------------|-----|----|----|------------------|----------|--------------------------------------|
| Teknaf    | Teknaf           | 5                                 | 7   | 3  | 1  | 5                | 1        | 1                                    |
|           | Mochuni          | 9                                 | 8   | 2  | 2  | 3                | 1        | 1                                    |
|           | Hnilla           | 7                                 | 4   | 1  | 1  | 10               | 1        | 1                                    |
|           | Moddah<br>Hnilla | 5                                 | 5   | 1  | 1  | 10               | 1        | 1                                    |
| Shilkhali | Shilkhali        | 8                                 | 6   | 1  | 1  | 5                | 1        | 1                                    |
|           | Mathabangha      | 3                                 | 3   | 2  | 2  | 5                | -        | 1                                    |
| Whykong   | Samlapur         | 7                                 | 3   | 1  | 1  | 10               | 1        | 1                                    |
|           | Monkhali         | 1                                 | 1   | -  | -  | 5                | -        | -                                    |
|           | Roikhong         | 4                                 | 5   | 1  | -  | 10               | 1        | 1                                    |
|           | Whykong          | 6                                 | 1   | 1  | -  | 10               | 1        | 1                                    |
| Total     | 10               | 55                                | 43  | 13 | 9  | 73               | 8        | 9                                    |

### 3.7.1 Household (HH) interview

- Individual/HH interviews were conducted with randomly selected interviewee, 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 interviewee was 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.

### 3.7.2 Key informant (KI) interview

The 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, NSP field partner 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.

### *3.7.3 Group interview*

- The purpose of the planned Group Interviews was to collect some information on the locality and local situation based on the consensus of the local people.
- Interviews were conducted at places, preferably at local tea stalls, road junctions and other local community places, where local people gathered spontaneously. No formal invitation to the local people were made for participating at the group interview.
- Mapping, seasonality's, 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 a group interview was held each day
- This was basically unstructured interview and a checklist of issues was used as a basis for questions

#### *3.7.4 Focus Group Discussion*

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

- During PRA, FGD were principally conducted with different stakeholder groups, mainly with local FD staff, forest villagers, local public representatives etc. other professional groups, like fuelwood collector, sawmill owner, etc.
- During RRA FGD were conducted with un
- The FGD were conducted by appointment and 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.

#### *3.7.5 Other PRA tools*

Resource mapping, ven 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.

#### *3.7.6 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. It also helped in triangulation of collected information and also helped in generating new questions for interview or discussions.

#### *3.7.7 Secondary Information Collection*

Some demographic data were collected from respective local Union Parishad sources. The report on secondary information collection on the GR prepared under NSP was also consulted and some information used, whenever necessary.

### 3.7.8 Organizing 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.

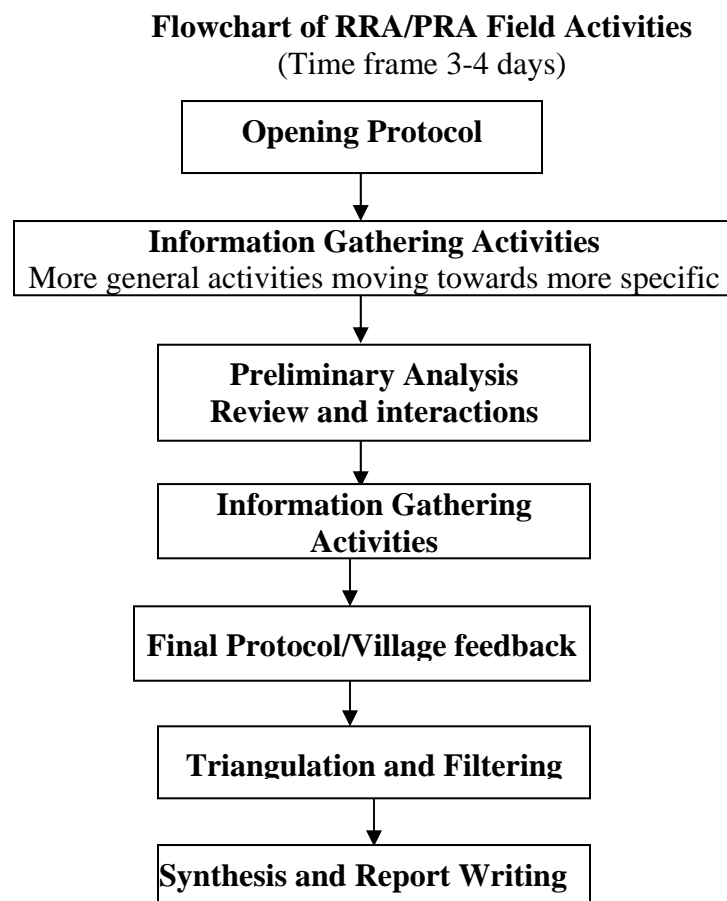


Fig. 2.

#### Team interaction

- After each day fieldwork, the team sat together at night for team interaction and triangulation and spent about one and half-hour for the purpose. 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
- Made methodological review

**Triangulation and filtering:** A single in formation may be collected by using several tools or from several sources. The team required to cross-check the results and accepts the most logical one. The team members had the opportunity to use his/their own judgment in accepting an answer.

### **3.8 Limitation of the Fieldwork**

The main limitation of the fieldwork was that it took place during the rainy season. This made working conditions difficult, and in particular meant that the traditional PRA approach of participants working together to complete large scale matrices on the ground was impossible, and researchers recorded information in note form and by completing matrices themselves either during the group discussion or afterwards. Therefore this work does not match the usual requirements of a PRA where information is analyzed and owned by the participants.

## 4. OUTCOMES

### 4.1 Status and Trend in Forest Dynamics

Fig. 3 shows the distribution of the various land use zones of the Teknaf Game Reserve (GR). The primary natural forest remains in tiny pockets with only scattered trees, mainly in Whykong Range and some parts of Shilkhali range. The long rotation plantations have turned into secondary natural forests and are also restricted in few places. Of them, the most notable plantations are in Jahazpura, Rajarchara, Mathabanga etc (scattered trees with dense undergrowth) and alongside the Dhaka-Teknaf Highway.

In fact, major part of the vegetation cover is dominated by herbs, shrubs and bush. Sun grass, which evolved with clearance of forest, also has wide coverage. Natural bamboo is almost extinct from the forest, especially from Teknaf range but now-a-days it is restricted to the few areas within Whykong Range. Betel leaf cultivation is now found almost everywhere throughout the entire GR area, predominantly in the west side (seaside) of the reserve.

There is a large garjan garden consisting about thousands of tall trees located in Jahazpura and scattered garjan forests also exist by the seaside, such as in Mathabangha and Rajarchara beat. Also scattered high forest is found in Samlapur, Monkhalia and Roikhang beat. Agricultural land occupies substantial areas within and around the forest, however, mainly in the Hnilla, Moddah Hnilla, Mouchuni and Teknaf Beat.

The long rotational tall trees are dominated by garjan, chapalish, jarul, teak, gamar, etc. The short-rotational and new plantations are located near the peripheral areas. The short-rotational plantations are mainly consisting of exotic trees, like akashmoni, mengium, eucalyptus, etc. There are also plots of coconut and jhau plantations alongside the sea. Bamboo and cane have been planted in the recent years in some plots.

# Teknaf GR Land Use Cover Map

(not to scale)

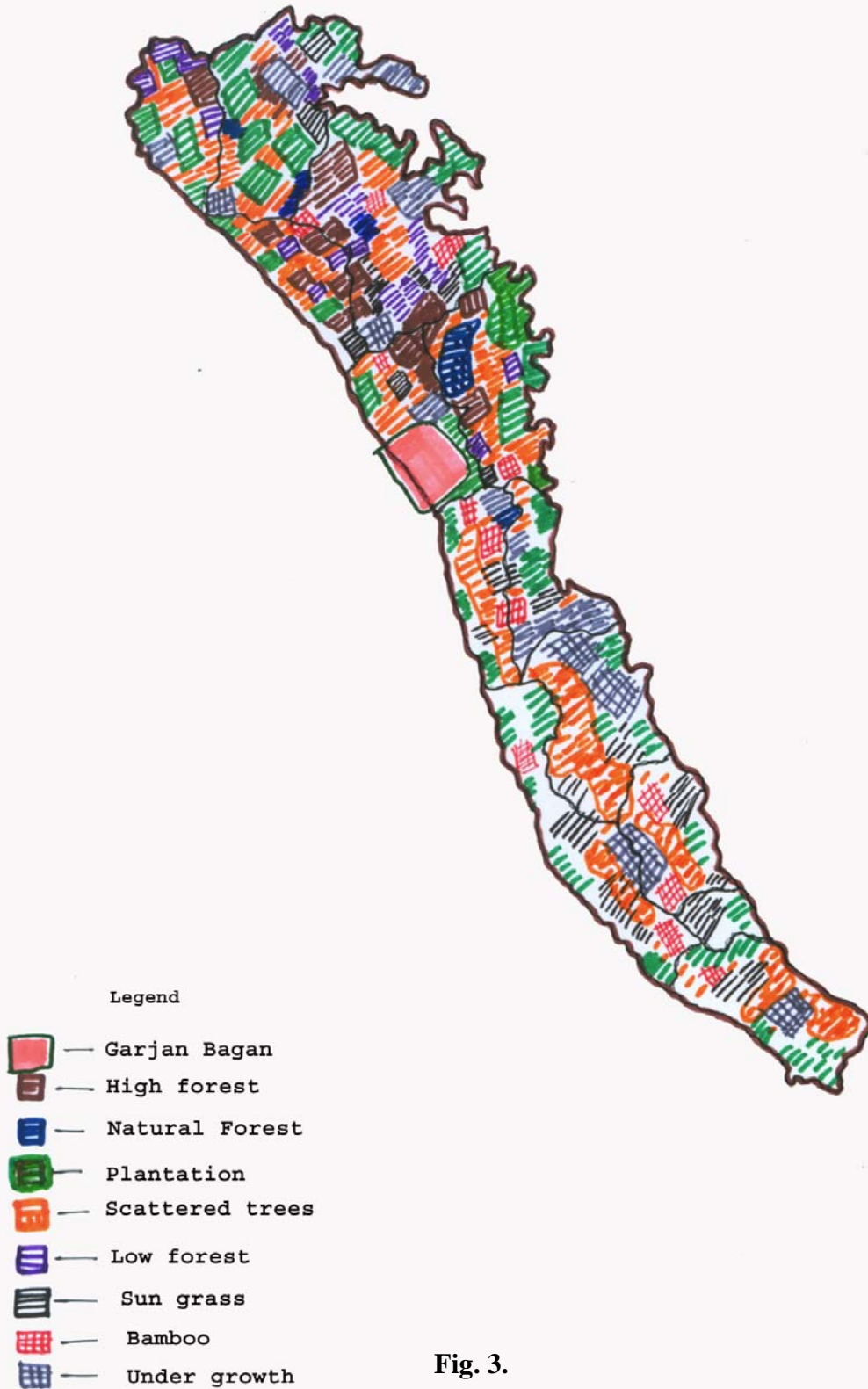


Fig. 3.



Fig. 4 shows the major areas of wildlife concentrations within the forest. The distribution of major animals are now restricted to few places only, where natural deep forest or scattered high forested areas are present.

It may be mentioned that wildlife in the forest has declined seriously over the past three decades. The elephants are concentrated mainly in Whykong, especially in the deep forest of Roikhong and Shamlapur beat and also in Rajarchara and Mathabhanga beats.

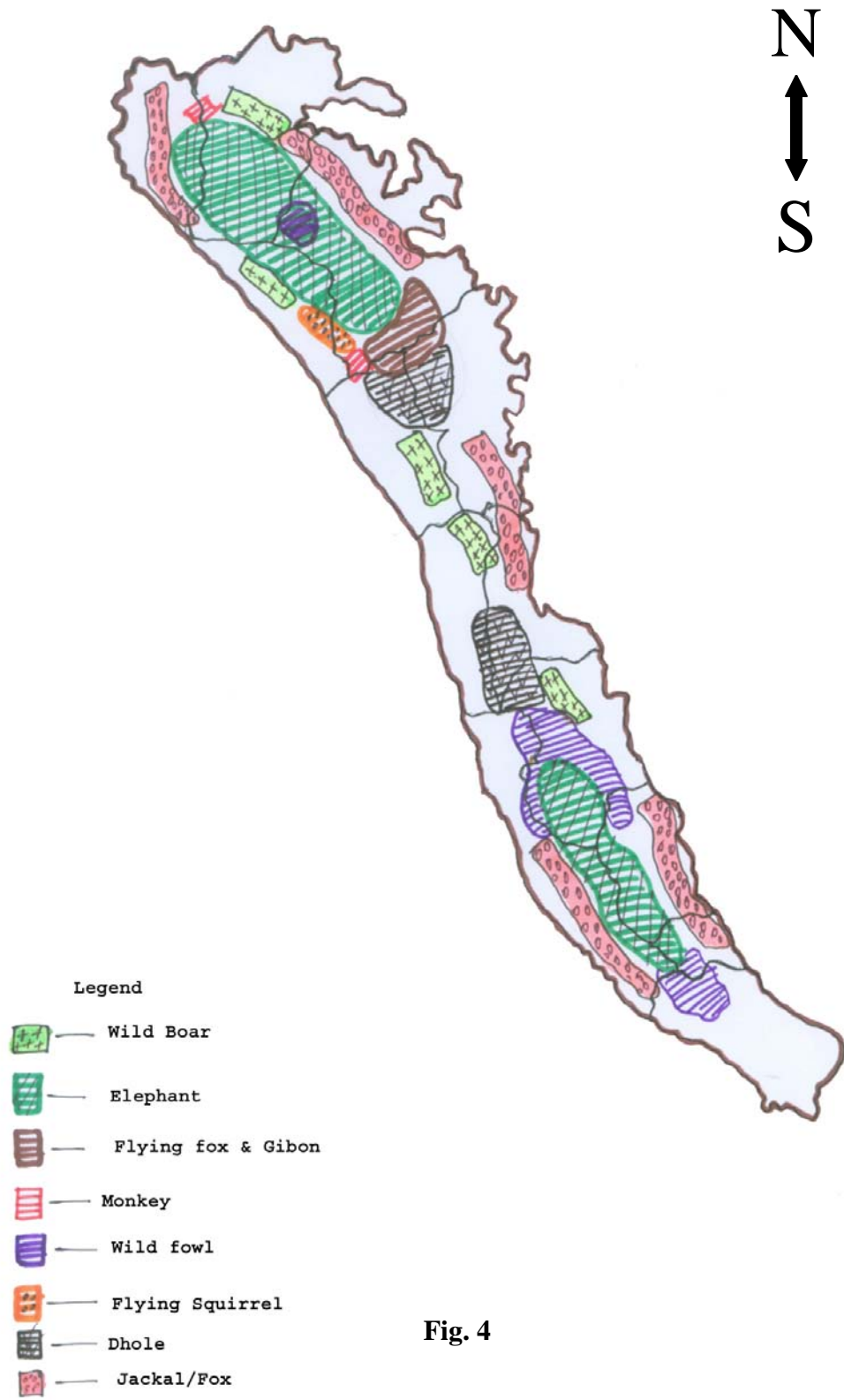
Deer are very rarely found, mainly in the remote, deep natural forest of Roikhang, Monkhali. Wild boar is found in almost in all the beats. Monkeys are found along the highway areas, like Shamlapur, Roikhong, Teknaf, etc. Flying squirrel is also found in the GR, mainly in a place in Shamlapur beat, locally called 'Bagher Mathay Taak'. Gibbon and flying fox are mainly restricted to Kudumchara. Overall, gibbon, monkeys, small deer, fox, squirrel, python etc. are concentrated in the natural deep forest as well as in thick long-rotational planted areas. They are also sparsely distributed in the thin old plantation areas. Pangolin is found nearby the settlements. The new plantations of exotic trees are very poor in its wildlife.

Table 8 provides information on the commonly available, endangered and locally extinct animals. Table 9 shows the changes in forest make up, forest resources and resource related activities.

Compared to pre-liberation period, forest cover has decreased by 60%, while forest thickness by 80%. Tall trees remain only by 10%, on the other hand, abundance of herbs and shrubs as well as undergrowth has increased in the recent years, particularly on the denuded hills.

Abundance of wild boar does not appear to be decreased much as it frequently appears in the locality. However, abundance of deer has decreased by 40% during the last 15 years, and presently they are very rare in the GR. Sungrass has increased by more than 80% in comparison with pre- liberation period.

**Teknaf GR**  
**Spatial Distribution of Major Wildlife**  
(not to scale)



**Fig. 4**

**Table 8. Information on plant and animals of the forest (based on PRA) of the Teknaf GR**

| Resource        | Types                     | Locally available species/species groups  | Locally endangered                                     | Locally extinct  |
|-----------------|---------------------------|---|--|--|
| Plant resources | Big trees/<br>Timber tree | Garjan, Chapalish, Segun, Bailum, Gamari, Civit, Koroi, Shonnal, Jam, Hargaza, Chanduil, Gutguitta, Kosoi etc.  | Telsur, chapalish, Bailum, Teak, Banyan                | Chandon, Pitraj  |
|                 | Fruits trees              | Lota am, cowgola, deua, chapalish, kanthal etc.   |  |  |
|                 | Medicinal plants          | Amloky, bashock, ashok, neem, etc.  | Arjun, Bohera, Hortoki                                 |  |
|                 | Under growth:             | The undergrowth is usually is a tangle of shrubs in Willie canes, bamboo and wild banana plants are common. Epiphytes are abundant and araid, ferns, mosses and orchids are very common. Climbers are also many. Various vegetables, herbs and shrubs, bamboo, sun grass etc. | Cane, natural muli bamboo                              |  |
| Wildlife        | Mammals                   | Deer, Elephant, Black deer, Monkey, Tiger, Mongoose, Wild dog, Wildfowl, Wild boar etc.   | Deer, Bear, Small tiger, Wild dog, Wild boar. Pangolin | Bengal tiger, Goyal, Samba Deer, Small monkey, Leopard, Wild cow |
|                 | Snakes                    | Python, Daras, Kalantor, kachupaitta, Ain hap, Dudraj, etc  | Python, cobra, Yellow monitor                          |  |
|                 | Birds                     | Dove, parrot, moyna, cuckoo, heron, king fisher, night jar etc  | Vulture, wild fowl                                     | Dhanesh birds (Risulla), peacock                                 |
|                 | Others                    | Fish  |  |  |

**Table 9. Trend Analysis (forest quality and resource use matrix)**

| Issue                                 | Pre-1971 | 15 years ago | Present       | Major causes for change  | Future Risk |
|---------------------------------------|----------|--------------|---------------|--|-------------|
| Forest cover                          | 00000    | 000          | 00            | Over exploitation/ tree felling, poaching/ expansion of settlement and Rohingas immigrant, agricultural activities & betel leaf cultivation, land encroachment and conversion/ problem in regeneration | High        |
| Forest thickness                      | 00000    | 000          | 0             | Do   | High        |
| Tall trees                            | 00000    | 0000         | 0 (10%)       | Illegal selective felling, problem in regeneration.  | High        |
| Herbs and shrubs/ undergrowth         | 00       | 000          | 00000         | Lack of tall tree cover  | Less        |
| Wildlife as a whole                   | 00000    | 000          | 0             | Habitat destruction and hunting in the past  | Medium      |
| Hunting                               | 00       | 0000         | 0             | Unavailability of game animals /birds and lack of awareness among people   | Less        |
| Illegal tree felling                  | 0        | 00000        | 000           | Poor forest patrol, poverty, deteriorating law and order situation<br>Lack of suitable timber trees  | High        |
| Fuelwood collection                   | 00       | 000          | 00000         | Lack of alternate fuel source, activity emerged as added income, no forest protection, unemployment  | Medium      |
| Land encroachment                     | 0        | 000          | 00000         | Population increase, establishing settlements by migrated people and Rohingas, betel vine cultivation,   | High        |
| Bamboo                                | 00000    | 0000         | 0             | Over harvesting, and increasing demand of bamboo for betel leaf cultivation, land reclaimed for plantation   | High        |
| Cane                                  | 00000    | 00           | 0 (very rare) | Do   | High        |
| Fruit bearing trees in the wild       | 00000    | 00           | 0             | Illegal felling, natural disaster, mono plantation   | Medium      |
| Betel leaf cultivation inside the GR  | 0        | 00           | 00000         | Damages of crop by elephant in paddy land, low risk, emerged as high profit business   | Medium      |
| Agricultural activities inside forest | 0        | 00           | 0000          | Population increase, the outsider agricultural land has converted into settlement  | Medium      |
| Jum (Shifting cultivation)            | 000      | 0000         | 00            | Officially Jum is banned now.  | Less        |

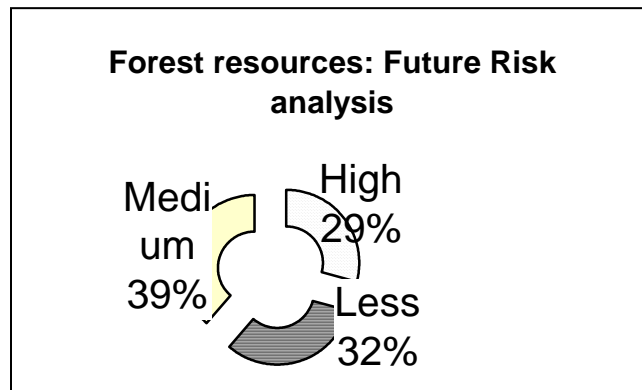
| Issue                | Pre-1971 | 15 years ago | Present       | Major causes for change  | Future Risk |
|----------------------|----------|--------------|---------------|--|-------------|
| Elephant             | 00000    | 000          | 00            | Habitat destruction and lack of food   | Medium      |
| Deer                 | 00000    | 000          | 0 (very rare) | Habitat destruction and hunting in the past  | Less        |
| Sun Grass            | 0        | 000          | 00000         | Due to massive destruction of tall trees, profitable, people are interested  | Less        |
| Medicinal Plant      | 00000    | 000          | 00            | Illegal feeling, alter by plantation of exotic trees, fuelwood collection  | Medium      |
| Snake                | 00000    | 000          | 0             | Killing, hunted by tribal and snake charmer  | Medium      |
| Fuel wood            | 00000    | 0000         | 000           | Abundance of fuelwood has decreased, over harvesting of trees  | Medium      |
| Birds                | 00000    | 0000         | 00            | Habitat destruction, not having tall trees and and hunting in past   | Medium      |
| Wild Fowl            | 00000    | 00           | -             | Massive hunting in the past  | High        |
| Tiger                | 00000    | 000          | 0             | Habitat destruction and hunted or killing by people  | Less        |
| Monkey               | 00000    | 000          | 00            | Habitat destruction, not having fruit bearing trees, disturbance by visitors   | Less        |
| Honey                | 00000    | 0000         | 0 (Very rare) | Illegal felling of trees, decrease in fruit trees and monoculture with exoitic plant species                                 | Medium      |
| Wild Boar            | 00000    | 0000         | 0000          | Hunting in past but now rate of hunting has decreased  | Less        |
| Wild Dog (Ram Kukur) | 00000    | 000          | 0(Very rare)  | Loss of habitat, scarcity of food  | High        |
| Vegetables           | 00000    | 0000         | 000           | Habitat destruction, land reclaimed for plantation, plantation practice, over exploitation                                   | Less        |
| Fodder               | 00000    | 000          | 00            | Do   | Less        |
| Livestock            | 00       | 000          | 0000          | For alternative income, but grazing land is limiting day by day. So livestock grazing popses a threats to natural regeration | Moderate    |

N.B 5 circles has used to indicate highest abundance/intensities

Undergrowth has increased 50%, incidences of land encroachments have increased by about fourfolds compared to pre-liberation period. In fact, major degradation has occurred in case of wildlife, probably by more than 80%, Medicinal plant abundance has decreased by 60%, Bamboo decreased 90% and cane are very rare at present.

It seems that abundance of elephant population has decreased little as it frequently visits the crop fields. Locally extinct animals probably include goyal, vulture, samba deer, leopard, Dhanesh bird (Risquilla). Locally extinct plants probably include chandan, pitraj, etc. Endangered plants of the reserve include telsur, chapalish, bailum, tick, cane, Arjun, Bohera, Hortoki, several fruits tree and that of wildlife probably included deer, small tiger, python, wild fowl, wild do etc. Abundance of medicinal plants has decreased by 60%.

Fig.5 analyzes the future risk of the trend of forest quality and resource use matrix. According to the trend, of the extracted resources, on the 39% resources have moderate level of future risk, for 29% resources this risk is very high that need to give immediate attention.



**Fig. 5.**

Fig. 6 and Fig. 7 represent two transect maps drawn during PRA along two transect lines nearby Shilkhali (west side) and Hnilla (east side). The maps clearly show the degradations caused to the forest and the poor existence of the natural forest. Compared to a perception transect map drawn as per local people memory indicates how the forest has changed over time. The main changes are reflected in transformation of forestland into agriculture land, replacement of natural forest by plantation and emergence of sungrass and dominance of herbs and shrubs. In east side forest make up has changed remarkably. People leveled the low hills into agricultural land, most of hills slopes have been transformed into betel vine yard by clearing the forest.

**Transect Map**  
 Site: Hnilla Beat  
 Date: 25/06/04

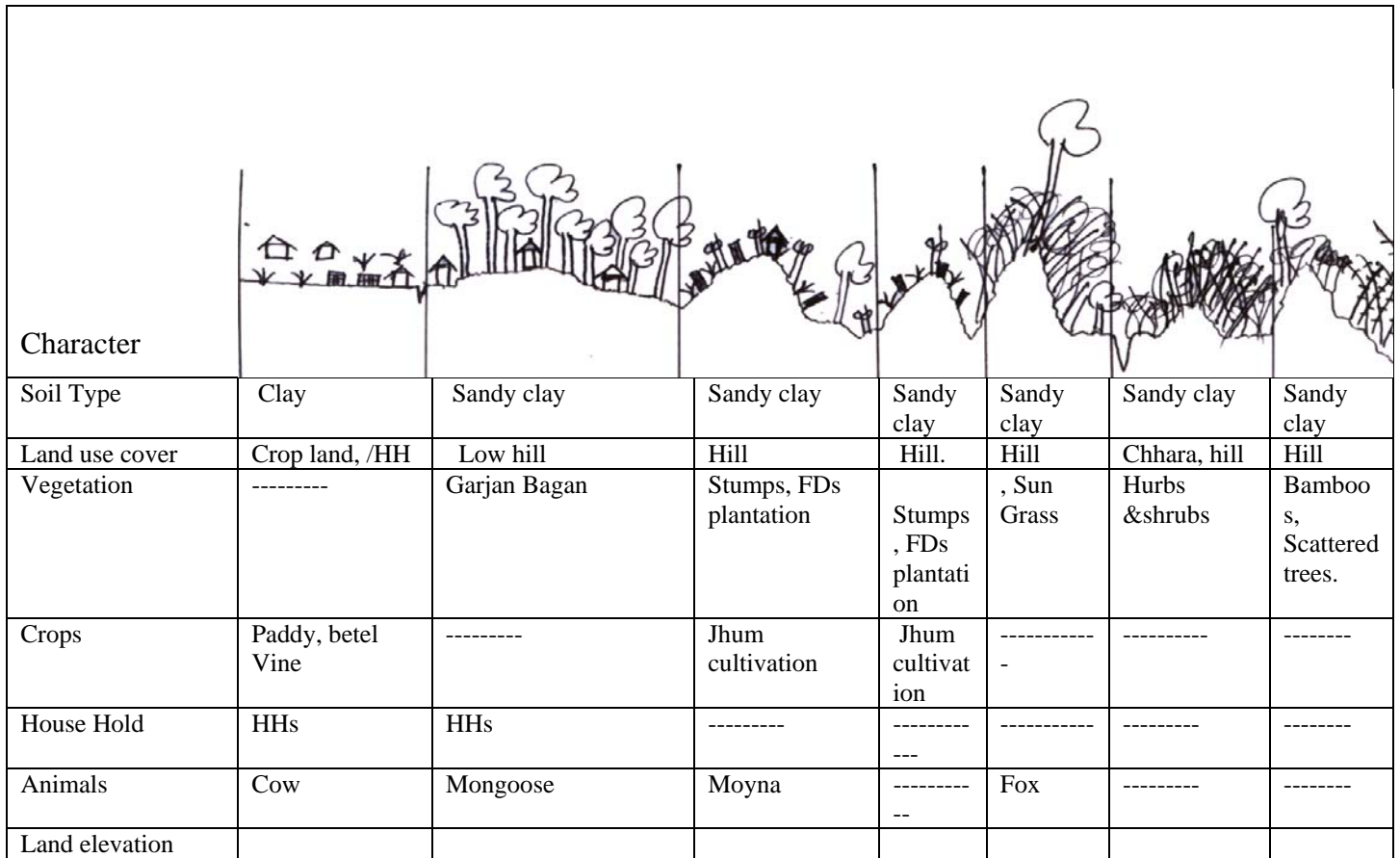
**Present situation**

|                             |                                 |                |           |                          |                            |                                  |
|-----------------------------|---------------------------------|----------------|-----------|--------------------------|----------------------------|----------------------------------|
| Character                   |                                 |                |           |                          |                            |                                  |
| Soil Type                   | Clay                            | Sandy clay     | Clay      | Sandy clay               | Sandy clay                 | Sandy clay                       |
| Land use cover              | Crop land,                      | Hill           | Marsh     | Hill.                    | Hill                       | Hill                             |
| Vegetation                  | -----                           | Hurbs & shrubs | Sun Grass | Hurbs & shrubs Sun Grass | Scattered trees, Sun Grass | Scattered trees, Hurbs & shrubs, |
| Crops                       | Paddy,                          | betel Vine     | Paddy     | -----                    | -----                      | -----                            |
| House Hold                  | HHs                             | HHs            | -----     | -----                    | -----                      | -----                            |
| Animals                     | Cow, Dog                        | Goat           | Fox       | Mongoose                 | -----                      | -----                            |
| <b>30 years ago situati</b> |                                 |                |           |                          |                            |                                  |
| Soil type                   | Sandy clay                      | Sandy clay     | clay      | Sandy clay               | Sandy clay                 | Sandy clay                       |
| Land use cover              | Hill                            | Hill           | Marsh     | Hill                     | Hill                       | , Hill                           |
| Vegetation                  | Scattered trees, Hurbs & shrubs | Deep forest    | -----     | Deep forest              | Deep forest                | Deep forest                      |
| Crops                       | -----                           | -----          | -----     | -----                    | -----                      | -----                            |
| Household                   | HH                              | -----          | -----     | -----                    | -----                      | -----                            |
| Animals                     | Monkey                          | Wild dog       | -----     | Deer                     | Elephant                   | -----                            |

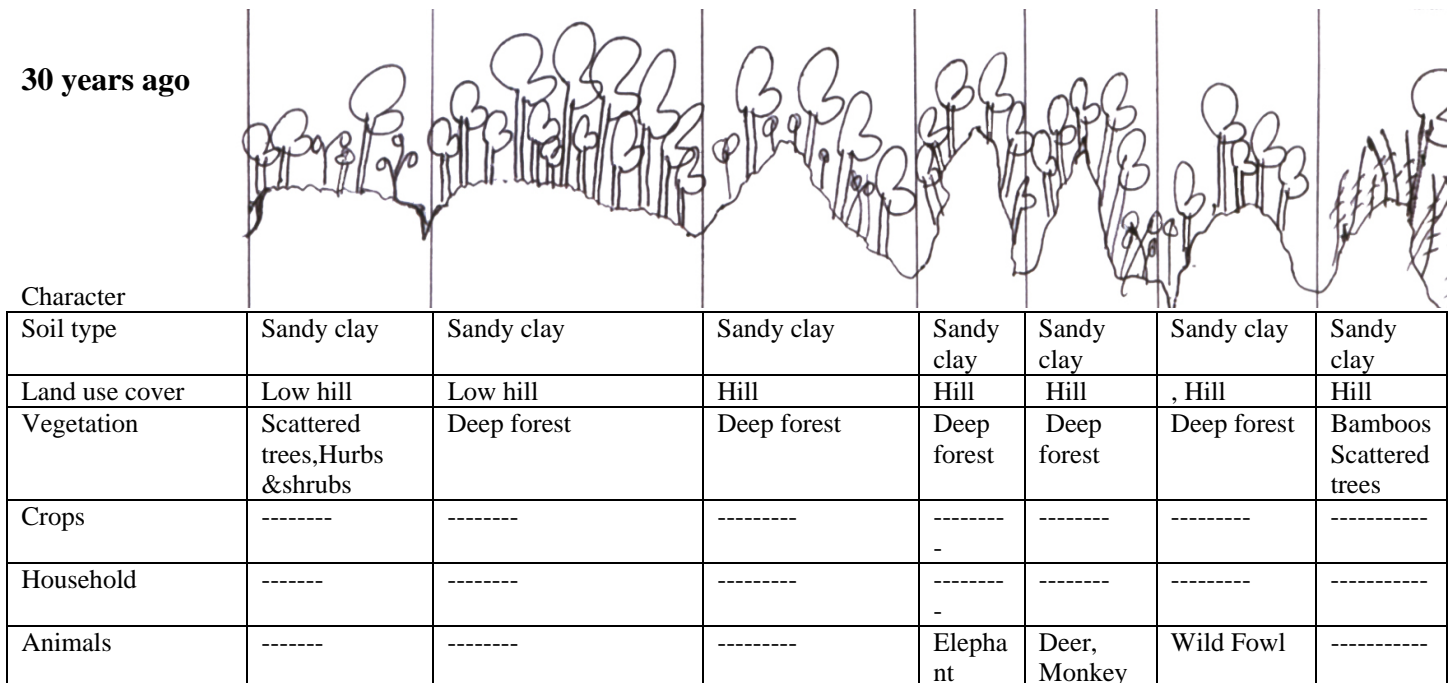
**Fig. 6.**

**Transect Map**  
 Site: Shilkhali Beat  
 Date: 23/06/04

**Present situation**



**30 years ago**



**Fig. 7.**

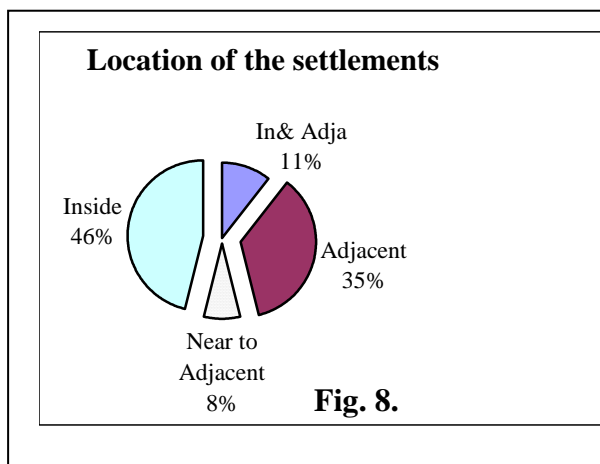


## 4. 2 Settlements and its Level of Stakes with the GR

### 4.2.1 Surrounding Villages

A total of 115 villages (excluding the Rohingya settlements) having stakes with the GR have been identified. These villages belong to 5 unions (i.e. Baharchara union, Hnilla Union, Sarbang union, Teknaf union, Whykong union of Teknaf and one Pourashava of Teknaf and Ukhia Upazila. Table 11 provides the list of these villages, indicates their locations and level of stakes with the GR, while Fig 9 to 11 show the geographical distribution of these settlements within and around the GR. The information are summarized in Fig 8 and Table 10 of the villages 46% are located inside the GR, 11% just at the periphery, 35% adjacent to the GR, while the rest 8 % are bit away from the GR. The identified villages have varing degrees of stakes with the GR. On the basis of resource use and forest degradation acivities, about 62% villages have major stakes, 32% have moderate and the rest of the villages have minor stakes with the GR.

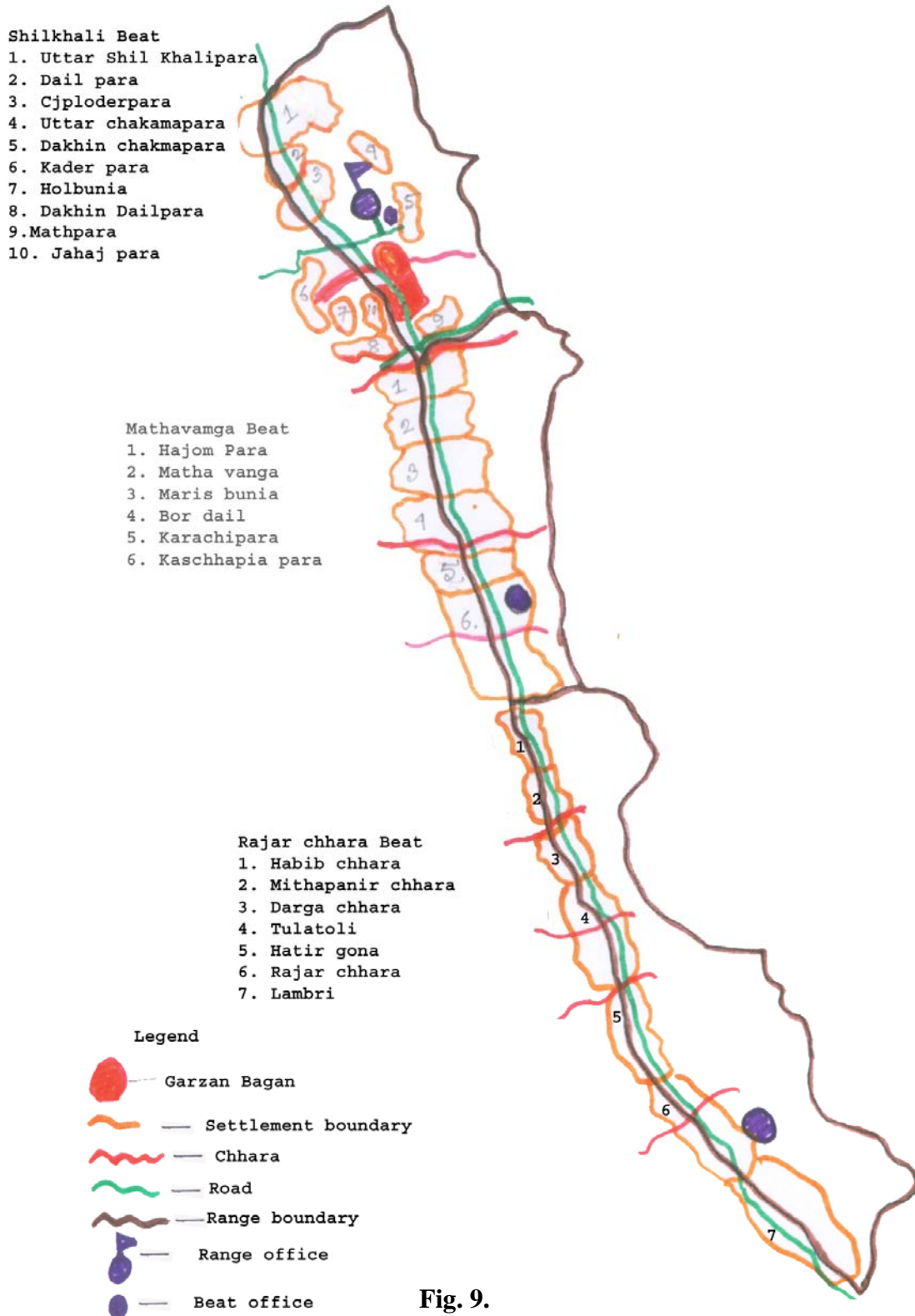
Besides, there are some Rohingya (refugees from Myanmar) settlements located inside of the GR of them, two (Nayapara Camp 1 and 2) have been formally established by the government. In addition, a few more settlements have been established illegally. These are located mainly in Jahajpura, Shamlapur and Teknaf.



**Table 10. level of stake of the settlements**

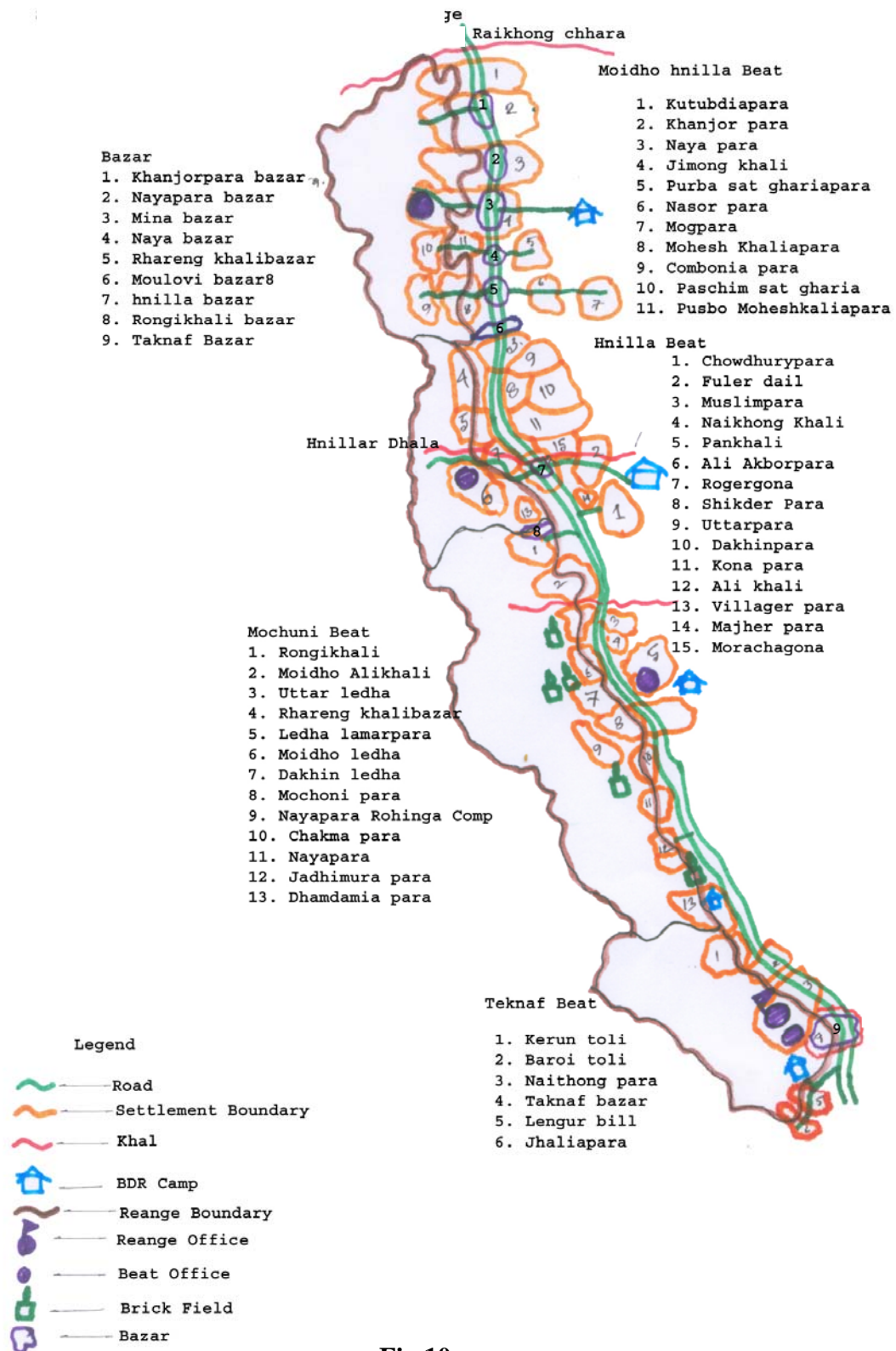
| Level of Stake | Village No. | %       |
|----------------|-------------|---------|
| Major          | 70          | 61.95%  |
| Moderate       | 36          | 31.86%  |
| Minor          | 7           | 6.19%   |
| Total          | 113         | 100.00% |

**Teknaf GR**  
**Distribution of Settlements of Shilkhali Range**  
(not to scale)



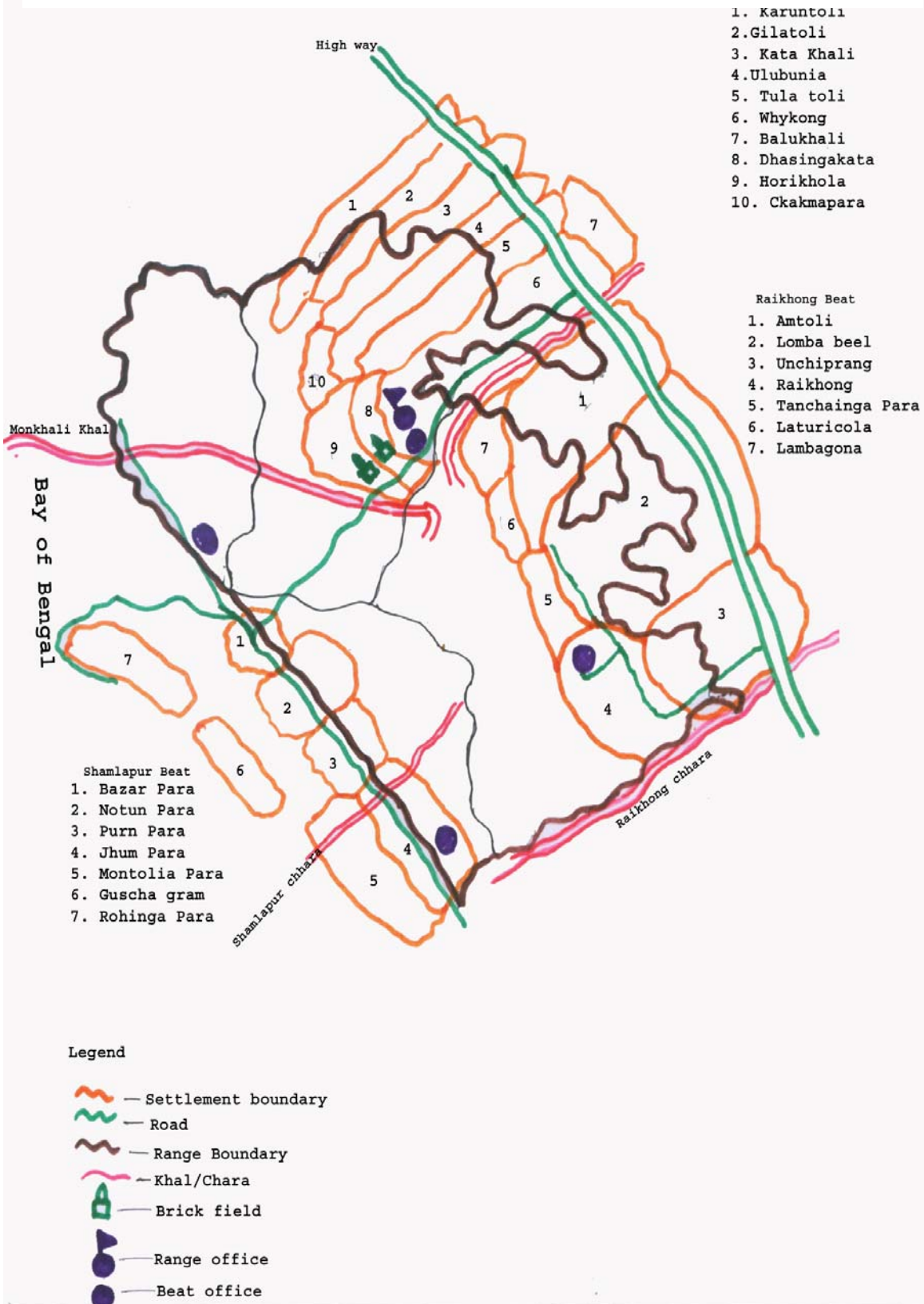
**Fig. 9.**

## Teknaf GR Distribution of Settlements of Teknaf Range (not to scale)



**Fig.10.**

**Teknaf GR**  
**Distribution of Settlements of Whykong Range**  
(not to scale)



**Fig.11**

**Table 11. Identified settlements and their level of stakes with Teknaf GR**

| Sl No | Village                       | Situation         | Beat      | Location           | Level of Stake |
|-------|-------------------------------|-------------------|-----------|--------------------|----------------|
| 1     | Puranpara                     | Baharchara Union  | Shamlapur | Inside             | Major          |
| 2     | Notunpara                     | Baharchara Union  | Shamlapur | inside             | Major          |
| 3     | Guschha gram                  | Baharchara Union  | Shamlapur | Adjacent           | Major          |
| 4     | Montoliapara                  | Baharchara Union  | Shamlapur | Adjacent           | Major          |
| 5     | Jhumpara                      | Baharchara Union  | Shamlapur | inside             | Major          |
| 6     | Rohingapara                   | Baharchara Union  | Shamlapur | Adjacent           | Major          |
| 7     | Kerontoli                     | Whykong union     | Whykong   | inside             | Major          |
| 8     | Chammapara                    | Zaliapalong Union | Monkhali  | inside             | Major          |
| 9     | Gilatoli                      | Whykong union     | Whykong   | Inside             | Major          |
| 10    | Chakmapara                    | Whykong union     | Whykong   | Inside             | Major          |
| 11    | Katakhali                     | Whykong union     | Whykong   | Adjacent           | Moderate       |
| 12    | Balukhali                     | Whykong union     | Whykong   | Adjacent           | Moderate       |
| 13    | horikhola                     | Whykong union     | Whykong   | Adjacent           | Moderate       |
| 14    | Ulubonia                      | Whykong union     | Whykong   | Inside             | Major          |
| 15    | Tulatoli                      | Whykong union     | Whykong   | Adjacent           | Moderate       |
| 16    | Whykong                       | Whykong union     | Whykong   | Near to Adjacent   | Moderate       |
| 17    | Chakmapara                    | Whykong union     | Whykong   | Inside             | Major          |
| 18    | Dhaingakata                   | Whykong union     | Whykong   | Inside             | Major          |
| 19    | Tanghaingapara                | Whykong union     | Whykong   | Inside             | Major          |
| 20    | Lombagonal                    | Whykong union     | Roikhong  | Inside             | Major          |
| 21    | Laturikola                    | Whykong union     | Roikhong  | Inside             | Major          |
| 23    | Amtoli                        | Whykong union     | Roikhong  | Inside             | Major          |
| 24    | Lombabeel                     | Whykong union     | Roikhong  | Inside             | Major          |
| 25    | Unchprang                     | Whykong union     | Roikhong  | Adjacent           | Moderate       |
| 26    | Roikhong                      | Whykong union     | Roikhong  | Inside             | Major          |
| 27    | Keruntoli                     | TK union          | Teknaf    | Inside             | Moderate       |
| 28    | Puran Pollan Para             | 2 no Ward, TK Pou | Teknaf    | adjacent           | Moderate       |
| 29    | Kaikkhalipara                 | TK Pou            | Teknaf    | adjacent           | Moderate       |
| 30    | Islamabad & natun Pallan para | 4 no Ward, TK Pou | Teknaf    | adjacent           | Moderate       |
| 31    | Damdamia                      | TK union          | Teknaf    | Inside             | Major          |
| 32    | Teknaf Bazar                  | TK Pou            | Teknaf    | Adjacent           | Major          |
| 33    | Naitongpara                   | TK Pou, 1 no ward | Teknaf    | Adjacent           | Major          |
| 34    | Kharak Khali                  | TK pou            | Teknaf    | adjacent           | Minor          |
| 35    | Uttar jaliapara               | TK Pou            | Teknaf    | adjacent           | Negligible     |
| 36    | daksin jaliapara              | TK pou            | Teknaf    | adjacent           | Negligible     |
| 37    | hangar para                   | TK pou            | Teknaf    | adjacent           | Minor          |
| 38    | daispara                      | TK pou            | Teknaf    | adjacent           | minor          |
| 39    | oliabad                       | TK pou            | Teknaf    | adjacent           | minor          |
| 40    | Teknaf reserve forest         | TK uni            | Teknaf    | Inside to adjacent | major          |
| 41    | hatir ghona                   | TK union          | TK uni    | adjacent           | moderate       |
| 42    | natun para                    | TK union          | TK uni    | adjacent           | moderate       |
| 43    | Baroitoli                     | TK union          | Teknaf    | Inside             | Major          |
| 44    | Nithongpara                   | TK union          | Teknaf    | Inside             | Major          |
| 45    | Lengurbeel                    | TK union          | Teknaf    | Inside             | Major          |

| Sl No | Village               | Situation     | Beat             | Location          | Level of Stake |
|-------|-----------------------|---------------|------------------|-------------------|----------------|
| 46    | katabunia             | Subrang union | Teknaf           | Near to adjacent  |                |
| 47    | Jahaliapara           | TK union      | Teknaf           | Inside            | Major          |
| 48    | Hechapara             | TK union      | Teknaf           | Inside            | Major          |
| 49    | Dumdamiapara          | Hnilla union  | Mosuni           | Inside            | Major          |
| 50    | Jhadimurapara         | Hnilla union  | Mosuni           | Inside            | Major          |
| 51    | Noyapara              | Hnilla union  | Mosuni           | Inside            | Major          |
| 52    | Chakmapara            | Hnilla union  | Mosuni           | Inside            | Major          |
| 53    | MoChunipara           | Hnilla union  | Mosuni           | Adjacent          | Moderate       |
| 54    | Noyapara Rohinga Camp | Hnilla union  | Mosuni           | Inside            | Major          |
| 55    | Dhakhin Ledha         | Hnilla union  | Mosuni           | Inside            | Major          |
| 56    | Moidho Ledha          | Hnilla union  | Mosuni           | Inside            | Major          |
| 57    | Lesha Lamarpara       | Hnilla union  | Mosuni           | Inside            | Major          |
| 58    | Ledha Puchingapara    | Hnilla union  | Mosuni           | Inside            | Major          |
| 59    | Purba Rongikhali      | Hnilla union  | Mosuni           | Inside            | Major          |
| 60    | Paschim Rongikhali    | Hnilla union  | Mosuni           | Inside            | Major          |
| 61    | Uttar Ledha           | Hnilla union  | Mosuni           | Adjacent + Inside | Moderate       |
| 62    | Dakhin Alikhali       | Hnilla union  | Mosuni           | Adjacent          | Moderate       |
| 63    | Moidho Alikhali       | Hnilla union  | Mosuni           | Inside            | Major          |
| 64    | Ali Akborpara         | Hnilla union  | Hnilla           | Inside            | Major          |
| 65    | Rojergona             | Hnilla union  | Hnilla           | Inside            | Major          |
| 66    | Marichagona           | Hnilla union  | Hnilla           | Adjacent          | Major          |
| 67    | Ali khali             | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 68    | Villagerpara          | Hnilla union  | Hnilla           | Inside            | Major          |
| 69    | Shikderpara           | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 70    | Uttarpara             | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 71    | Dakhinpara            | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 72    | Konapara              | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 73    | Majherpara            | Hnilla union  | Hnilla           | Adjacent          | Moderate       |
| 74    | Muslimpara(Maughpara) | Hnilla union  | Hnilla           | Outside           | Moderate       |
| 75    | Nikhang khali         | Hnilla union  | Hnilla           | Adjacent + Inside | Major          |
| 76    | Chowdhurypara         | Hnilla union  | Hnilla           | Outside           | Moderate       |
| 77    | Fulerdail             | Hnilla union  | Hnilla           | Outside           | Moderate       |
| 78    | Pankhali              | Hnilla union  | Hnilla           | Adjacent + Inside | Major          |
| 79    | Kutubdiapara          | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |
| 80    | Khanjorpara           | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |
| 81    | Karachipra            | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |
| 82    | Rajargona             | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |
| 83    | Noyapara              | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |
| 84    | Jimongkhali           | Whykong union | Moidho<br>Hnilla | Adjacent          | Moderate       |

| Sl No | Village                | Situation        | Beat          | Location         | Level of Stake |
|-------|------------------------|------------------|---------------|------------------|----------------|
| 85    | Purbo Satghariapara    | Whykong union    | Moidho Hnilla | outside          | Moderate       |
| 86    | Paschim Satghariapara  | Whykong union    | Moidho Hnilla | Inside           | Major          |
| 87    | Purbo Moheshkhaliapara | Whykong union    | Moidho Hnilla | Adjacent         | Moderate       |
| 88    | Moheshkhalipara        | Whykong union    | Moidho Hnilla | Adjacent         | Major          |
| 89    | Komboniapara           | Whykong union    | Moidho Hnilla | Inside           | Major          |
| 90    | Nachorpara             | Whykong union    | Moidho Hnilla | Outside          | Moderate       |
| 91    | Maughpara              | Hnilla union     | Moidho Hnilla | Outside          | Major          |
| 92    | Dakhin Dailpara        | Baharchara Union | Shilkhali     | Inside           | Major          |
| 93    | Jahajpura Mathpara     | Baharchara Union | Shilkhali     | Inside           | Major          |
| 94    | Miarpara               | Baharchara Union | Shilkhali     | Inside           | Major          |
| 95    | Holbunia               | Baharchara Union | Shilkhali     | Adjacent         | Moderate       |
| 96    | Kaderpara              | Baharchara Union | Shilkhali     | Adjacent         | Moderate       |
| 97    | Uttaar Chakmapara      | Baharchara Union | Shilkhali     | Inside           | Major          |
| 98    | Dakhin Chakmapara      | Baharchara Union | Shilkhali     | Inside ,Adjacent | Major          |
| 99    | Uttar Shilkhali        | Baharchara Union | Shilkhali     | Inside           | Major          |
| 100   | Chokiderpara           | Baharchara Union | Shilkhali     | Outside          | Moderate       |
| 102   | Rajar Chhara           | TK Union         | Rajar Chhara  | Inside           | Major          |
| 103   | Habib Chhara           | TK Union         | Rajar Chhara  | Inside           | Major          |
| 104   | Mithapanir Chhara      | TK Union         | Rajar Chhara  | Inside           | Major          |
| 105   | Darga Chhara           | TK Union         | Rajar Chhara  | Inside           | Major          |
| 106   | Tulatoli               | TK Union         | Rajar Chhara  | Inside           | Major          |
| 107   | Hatirgona              | TK Union         | Rajar Chhara  | Inside           | Major          |
| 108   | Lambari                | TK Union         | Rajar Chhara  | Inside           | Major          |
| 109   | Kachchhapiapara        | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 110   | Karachipara            | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 111   | Noakhali               | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 112   | Bordail                | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 113   | Morisbunia             | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 114   | Mathabanga             | Baharchara Union | Mathabanga    | Inside ,Adjacent | Major          |
| 115   | Hajompara              | Baharchara Union | Mathabanga    | Inside, Adjacent | Major          |

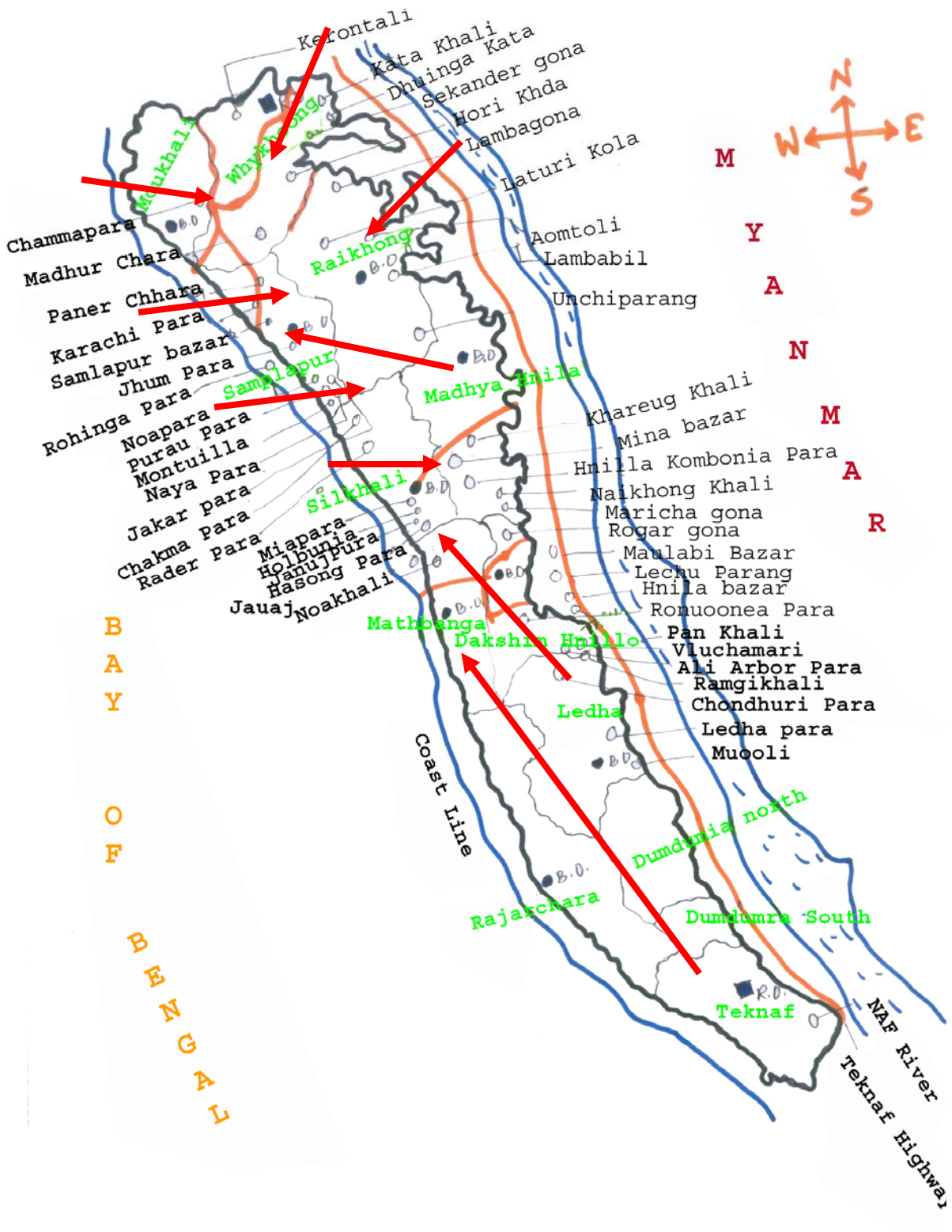
There are also a number of ethnic settlements (i.e. Chamma Para of Monkhali under Zaliapalong Union of Ukhia Thana, Chowdhuri Para, Nila Para and Kharang Khali of Hnilla and a Chakma Para in Whykong) located within the GR.

Most of the villages of Hnilla, Baharchara and Whykong Unions, and all the villages of Reserve Teknaf Mouza of Teknaf union, few villages of Zaliapalong and Palong Khali Union of Ukhia have major stakes with the GR. Besides, the villages of Lengurbill and Teknaf Mouza of Teknaf Union, some part of Teknaf pourashova and villages of subrang mouza of subrang union have direct but less stake with the GR. All the ethnic villages have major stakes with the forest. (Chamma Para (Chakma Para) Under Monkhali Beat, Zaliapalong Union of Ukhia Thana, Jumpara, Shamlapur, Mon tuilla, Villager Para, Lachu Prang Para, Pan Khali, Ali Akber Para, Rojar Gona, Nai-Khong Khali, Kader Para, Holbunia, Jahazpura, Kerun Toli, Dhuingha Kata, Hori Khola, Lomba Gona, Sikander Gona, Roikhong, Uttar Shilkhali etc.)

Fig .14 shows the human pressure on the forest from different settlements. People from Hnilla and Moddah Hnilla beat mostly involved with illegal felling. Often, by groups, they travel to another beat where some tall timber trees are available. Almost all the HHs surrounding the GR is involved with fuelwood collection, while people from Chammapara are dependent on fuelwood collection for their livelihood. The Rohingas are mainly dependent on the exploitation of forest resources. Most of the poor villagers or the HHs of inside villages, depend on the forest for their every day HH needs of fuelwood and other forest products.



**Teknaf GR**  
**Human Pressure on Forest from Neighbouring Villages**  
(not to scale)



→ Human Pressure

**Fig.12.**

Table 12 provides information on the exploitation of different resources by the people of different beats. As it appears, almost all settlements are involved with fuelwood and building material collection. People from Moddahnilla, Shamlapur, Roikhong and Monkhali area are involved with illegal tree felling. The cultivation betel leaf is done predominantly in Shilkhali and Mathabanga beats. Jum cultivation is more prevalent in Teknaf, Mouchuni, Khilkhali and Hnilla beats.

**Table 12. Resourcewise stakes with different beats**

| Sl | Beat          | Range     | Fuelwood collectionm | Illegal timber feeling | Collection of trees as building materials | Bamboo & cane collection | Betel leaf cultivation | Jhum cultivation | Involvement in land encroachment | Brick field | Livestock grazing | Hunting |
|----|---------------|-----------|----------------------|------------------------|---|--------------------------|------------------------|------------------|----------------------------------|-------------|-------------------|---------|
| 1  | Whykong       | Whykong   | 00000                | 0000                   | 0000                                      | 000                      | 000                    | 0000             | 000                              | 00          | 00                | 0       |
| 2  | Roikhong      |           | 00000                | 0000                   | 00000                                     | 0000                     | 000                    | 000              | 00                               | --          | 0000              | 00      |
| 3  | Shamlapur     |           | 00000                | 00000                  | 00000                                     | 000                      | 0000                   | 00               | 00                               | --          | 00                |         |
| 4  | Monkhali      |           | 00000                | 00000                  | 00000                                     | 000                      | 0000                   | 00               | 0                                | --          | 00                | 00      |
| 5  | Shilkhali     | Shilkhali | 00000                | 0000                   | 00000                                     | 00                       | 00000                  | 00000            | 000                              | --          | 0                 |         |
| 6  | Mathavanga    |           | 00000                | 000                    | 00000                                     | 00                       | 00000                  | 0000             | 00                               | --          | 000               |         |
| 7  | Rajarchhara   |           | 00000                | 00                     | 00000                                     | 00                       | 0000                   | 0000             | 000                              | --          | 0000              |         |
| 8  | Teknaf        | Teknaf    | 00000                | 00000                  | 0000                                      | 00                       | 00                     | 00000            | 0000                             | --          | 00                |         |
| 9  | Mochuni       |           | 00000                | 000                    | 00000                                     | 0                        | 000                    | 00000            | 000                              | 00000       | 00                |         |
| 10 | Hnilla        |           | 00000                | 000000                 | 00000                                     | 0                        | 0000                   | 00000            | 00000                            | --          | 00000             | 00      |
| 11 | Moidho Hnilla |           | 00000                | 000000                 | 00000                                     | 0                        | 00000                  | 0000             | 0000                             | --          | 00000             | 00      |

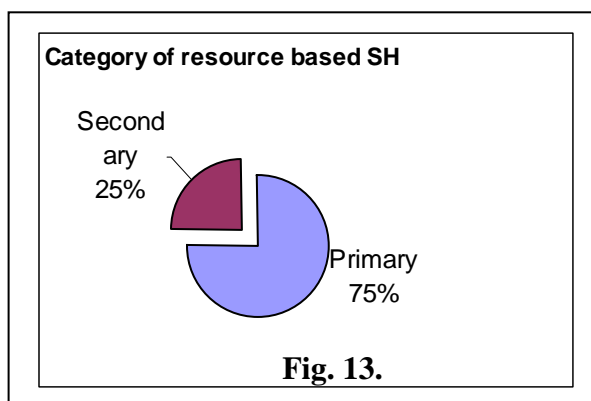
### 4.3 Stakeholder Assessment

The stakeholders (sh) indentified the Teknaf GR could be broadly categorized into the following groups. Further details on these groups are provided below.

- Primary stakeholder- involved with direct extraction of resources from the forest or their activities directly affect the forest
- Secondary stakeholders – indirectly linked with the forest, involved with trading or exert influences on the forest
- Institutional stakeholders – Government departments, non-government organizations, community organization involved with the management and administration, development of the GR and the poeple living and around the GR

#### 4.3.1 Primary stakeholders

Table.13 provides information on stakeholder typs and category, stakeholder description, their activities, dependency, relative level of stakes with the forest and their influence. A total of 29 stakeholder groups (excluded demographical and institutional SH) have been identified in the GR area, of them 75% are primary SH and rest 25% are secondary SH (Fig 13). Among the SH, 19 are primary stakeholders and are involved directly in resource extraction and forestconversion activities, and the rest are Secondary stakeholders. Of them, 3 SH groups (Fuelwood collector, Illegal timber feller, Betel leaf cultivator) have major stakes with the forest having major role in forest degradation, while 6



have medium stakes (Bamboo collector, House building mat. collector, Land encroacher, Timber trader, Sawmill owners, Furniture shop owners) and the rest have minor stakes with the forest.

Most of the primary stakeholders are poor people from the inside forest viallges and adjacent villages. Women and children are mainly involved with fuelwood and vegetable collection. Sometimes old and unemployed adults also collect fuelwood. Illegal felling of timber trees are carried out by adult people 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 fuelwood and bamboo, and other products form the primary stakeholders.

**Table 13. Information on the stakeholders of Teknaf GR (based on resource extraction and direct activities in the forest)**

| Sl no. | Stakeholder (SH) name | SH category | SH Description  | Role/Description of activities of SH  | Impact on forest and its resources  | Dependency for livelihood  | Level of stake | Risks of the activity carry out by this SH                      |
|--------|-----------------------|-------------|---|---|---|--|----------------|---|
| 1      | Brick Field           | Secondary   | Influential persons                                     | Purchase fuel wood from the local people and also appoint labor to cut tree branches fuel wood day basis  | Timber and planted trees are decreasing                                   | Not dependent  | Major          | High  |
| 2      | Timber merchant       | Secondary   | Business men, Influential person                        | Engaged day labor for tree feeling  | Big trees are going to be exhausted                                       | Dependent on a very small scale for added income   | Moderate       | High  |
| 3      | Betel leaf Cultivator | Primary     | Forest villagers and local poor and middle class people | Forest villagers and outsider people encroach land for Betel Leaf Cultivation, they burn the under growth for preparing the field and cutting bamboos for making fence. | Forest land are temporarily encroached, Burning the undergrowth           | Dependent on this activity for livelihood support.   | Major          | high risk, Biodiversity is damaging, forest cover is decreasing |
| 4      | Saw mill Owner        | Secondary   | Influential persons                                     | Purchase timber from the local people and also appoint labor to cut tree day basis  | Timber and planted trees are decreasing                                   | Not dependent  | Minor          | High  |
| 5      | Fuelwood collector    | Primary     | Children, women, and very poor men, tribal              | Usually they cut the newly planted trees and bring it after few days, besides they also cut tree branches and small trees   | Forest plantation is exhausting and decreasing the habitat of wild lives. | Meet HH needs Livelihood of many families entirely depend on it Some sell for added income | Major          | High  |
| 6      | Sun-grass collector   | Primary     | peoples of all works/day labour/forest villagers        | They collect Sun-grass and after collecting they burn that Chhanmohol   | Decreasing wildlife habitat   | Meet HH needs, Livelihood of many families partially depend                                | Minor          | Low   |

| Sl no. | Stakeholder (SH) name    | SH category | SH Description                                     | Role/Description of activities of SH   | Impact on forest and its resources         | Dependency for livelihood                           | Level of stake | Risks of the activity carry out by this SH |
|--------|--------------------------|-------------|--|--|--|---|----------------|--|
|        |                          |             |  |  |  | on it in seasons. Some sell for added income        |                |  |
| 7      | Hunter/<br>Zankhi/Pollan | Primary     | influential persons, tribal and some local people. | They catch wild animals such as deer, pig, wild cock etc by trap and sometimes shot down those by gun.   | Decreasing wild life                       | Not dependent                                       | Minor          | Medium                                     |
| 8      | Birds hunter             | Primary     | influential persons and poor local people          | They catch birds following indigenous method such as they make strong glue by mixing the latex of Garjan and Dumor tree, then they make trap putting this glue on the branches of big tree. Afterwards when the little birds seat on that tree and cannot fly. | Decreasing Birds.                          | Not dependent                                       | Minor          | Medium                                     |
| 9      | Dry leaf collector       | Primary     | Children & women                                   | They collect for own consumption and often sold it in local market, 10Tk per sac.  | -  | Meet HHs fuel needs and also sell for added income. | Minor          | Low  |
| 10     | Green Leaf collector     | Primary     | man and fisherman                                  | Collect Achaila leaf for transporting fish, Bashock & ashock leaf as medicinal purpose.  | -  | Not dependent                                       | Minor          | Low  |
| 11     | Bamboo Collector         | Primary     | Local poor and betel leaf cultivator               | They procure for commercial and own consumption  | Bamboos are declining and elephant food is | Not dependent and collect it for HHs need and       | Moderate       | High                                       |

| SI no. | Stakeholder (SH) name     | SH category | SH Description                  | Role/Description of activities of SH  | Impact on forest and its resources                       | Dependency for livelihood  | Level of stake | Risks of the activity carry out by this SH |
|--------|---------------------------|-------------|---------------------------------|---|--|--|----------------|--|
|        |                           |             |                                 |   | reducing   | also for commercial puepose.   |                |  |
| 12     | Boat Owner                | Secondary   | Solvent people                  | They transport timber & help the tree poacher   | Tree poacher are encouraged                              | Partially dependent  | Minor          | Low  |
| 13     | Boat maker                | Secondary   | Carpenter                       | Purchase timber and some times also motivated people for cutting off valuable tree.   | Forest trees are declining especially Garjan             | Partially dependent  | Minor          | Medium                                     |
| 14     | Chander Gari (Zeep owner) | Secondary   | Solvent people                  | They transport timber & help the tree poacher   | Tree poacher are encouraged                              | Partially dependent  | Moderate       | Low  |
| 15     | Illegal Tree feller       | Primary     | poor day labour, tribal, terror | Cutting off valuable timber plants  | Forest cover are decreasing                              | Many HHs entirely depent on this activity, many depend partially for their livelihood. | Major          | High                                       |
| 16     | Cane collector            | Primary     | women,                          | They collect cane and use it for handicrafts or sell  | Cane are seriously decreasing                            | Not dependent  | Minor          | High                                       |
| 17     | Fruit Collector           | Primary     | local people, child             | Collect various fruits Lata mangos, litchi, Chapalish Kanthat, Daua, Bakumgola, Chalta, Amloky, Olive,Hartoki, bohera, banana etc).Often cowgola are collected for selling in local market. | Some times they cut the trees for procurement of fruits. | Not dependent  | Minor          | Low/ The fruits are going to be disappear  |
| 18     | Vegetables                | Primary     | child & woman                   | Collect vegetables (aurum,  | Not very much  | Not dependent,   | Minor          | low  |

| SI no. | Stakeholder (SH) name     | SH category | SH Description                    | Role/Description of activities of SH  | Impact on forest and its resources    | Dependency for livelihood            | Level of stake | Risks of the activity carry out by this SH |
|--------|---------------------------|-------------|-----------------------------------|---|---------------------------------------|--------------------------------------|----------------|--|
|        | Collector                 |             |                                   | Daeki etc) for own uses   |                                       | meet their HHs needs                 |                |  |
| 19     | Outsider Researcher Group | Secondary   | different university team         | Collect several sample trees such as medicinal trees, or animal survey  | Not very much                         | Not dependent                        | Minor          | Low  |
| 20     | Fisherman                 | Primary     | Poor people                       | Procure and also culture fish into the Ziri/Goda/Kona(wetland) inside the forest. On the otherside fisherman who catches fish in bay, they also procure various trees as poles, leaf etc. | Not very much                         | Partially dependent for added income | Minor          | Low  |
| 21     | Tea stall Owner           | Secondary   | local people                      | They purchase fuel wood from the children or people, and use it as fuel   | it encouraged the fuel wood collector | Not dependent                        | Moderate       | Low  |
| 22     | Stone collector           | Primary     | day labor, and In Direct/merchant | In dry season, illegally collected stone for road/household construction  | Erosion of soil and hill,             | Not dependent                        | Minor          | Medium                                     |
| 23     | Sand collector            | Primary     | day labor, In Direct/merchant     | They procure sands from the Ziri/canal situated in side the forest.   | Erosion of hill,                      | Not dependent                        | Minor          | Medium                                     |
| 24     | Shrub collector           | Primary     | Children                          | They collect shrub (lota) using as alternative of rope or fiber   | Undergrowth is decreasing             | Not dependent                        | Minor          | low  |

| SI no. | Stakeholder (SH) name                 | SH category | SH Description                          | Role/Description of activities of SH  | Impact on forest and its resources                             | Dependency for livelihood | Level of stake | Risks of the activity carry out by this SH |
|--------|---------------------------------------|-------------|---|---|--|---------------------------|----------------|--|
| 25     | Traditional Healer (Boiddah /Kabiraj) | Primary     | maximum outsider                        | Collect various medicinal plants  | -  | Partially dependent       | Minor          | Low  |
| 26     | Snake Charmer                         | Primary     |   | Catch different snakes, often feed snake poison to children as a protection from various diseases.  | Snakes are decreasing  | Partially dependent       | Minor          | Low  |
| 27     | Fodder collector                      | Primary     | forest villagers, cow boy               | Collect grass and fodder; often send their bull, buffalo and cattle to forest for grazing during rainy season and paddy cultivation period. | Grass and undergrowth are decreasing                           | Partially dependent       | Moderate       | Medium                                     |
| 28     | Shifting (Jum) Cultivator             | Primary     | Local poor people & tribal              | They clean specific hill, burning the bush and then cultivate   | Forest bio-diversity is hampered, soil fertility is decreasing | Partially dependent       | Moderate       | High                                       |
| 29     | House building materials collectors   | Primary     | Forest villagers and surrounding people | Collect various materials as per needs for HHs building   | Several plant resources are decreasing                         | Partially dependent       | Moderate       | High                                       |



**Table 14. Level of stake and SH types**

| Level of stake  | Data | SH category    |                | Grand Total    |
|-----------------|------|----------------|----------------|----------------|
|                 |      | Primary        | Secondary      |                |
| Major           | No   | 4              | 1              | 5              |
|                 | %    | 18.18%         | 14.29%         | 17.24%         |
| Minor           | No   | 14             | 3              | 17             |
|                 | %    | 63.64%         | 42.86%         | 58.62%         |
| Moderate        | No   | 4              | 3              | 7              |
|                 | %    | 18.18%         | 42.86%         | 24.14%         |
| <b>Total No</b> |      | <b>22</b>      | <b>7</b>       | <b>29</b>      |
| <b>Total %</b>  |      | <b>100.00%</b> | <b>100.00%</b> | <b>100.00%</b> |

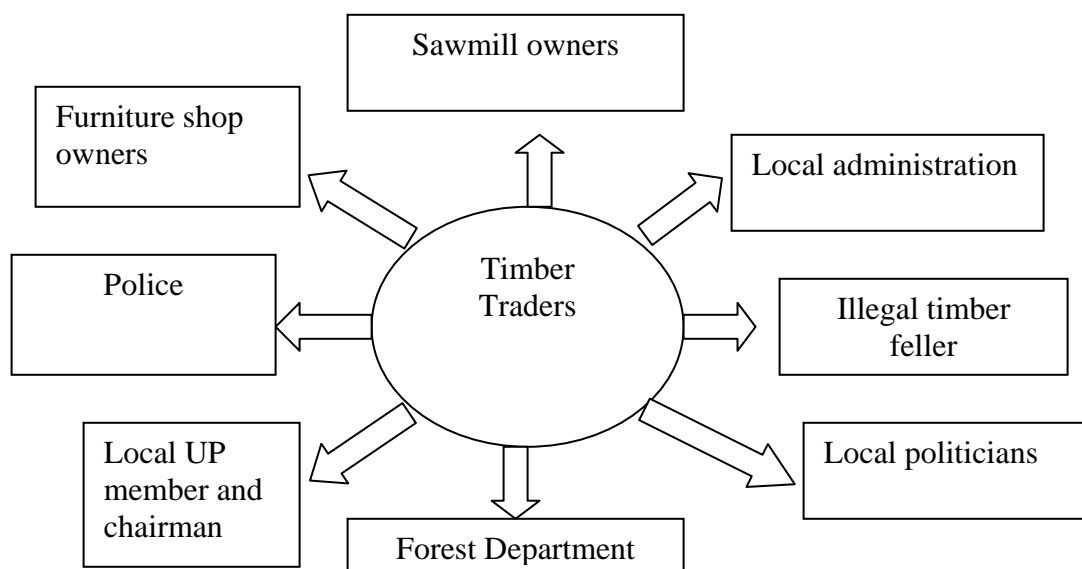
Table.14 shows the relative level of stakes of primary and secondary SH with GR based on resource extraction. Almost all HHs of the inside villages (Forest villages) are involved with resource extraction, mainly for meeting their HH needs. The detail information on the important primary stakeholders are given in section 4.4.4

#### 4.3.2. Secondary Stakeholders

A total of seven resource extraction based secondary SH groups (i.e Brick Field Owner, Timber merchant, Boat Owner, Boat maker, Chander Gari (Zeep owner), tea stall owner, sawmills owner have been identified. They are not directly involved with forest resource extraction from the GR, but are linked either with its processing, trading and utilization. A brief description of these stakeholders and their activities are given below.

##### 4.3.2.1 Fuelwood and timber traders

There are about 15 to 20 timber traders in the area, located at Shamlapur, Hnilla, Teknaf bazar and are involved with timber trading. Many of them have no valid license for the trading of timber. They usually receive sawed timber from sawmills and trade locally. It is alleged that they sometimes receive illegally felled timber from thieves and get sawed and sell it and thus help in the illegal felling of timber. Fig. 14 shows the relative link of timer trader with different groups.



**Fig. 14. Link of various stakeholders with timber traders**

There are about 4-5 fuelwood traders at shamlapur bazaar, about 10-12 at Teknaf bazar and 4-5 in Hnilla and Mouluvi bazar. Several trucks of fuelwood is transported everyday from this area and majority of which come from the GR and substantial fuelwood also sold locally by the traders. The traders procure fuelwood from the individual collectors, stack them and also sell it to the local consumers, while the others transport it by trucks, boat, zheep to Cox'sbazar, Chittagong even to Dhaka, and other local markets. The marketing opportunities have increased during the recent times at the local level.

#### 4.3.2.2 Sawmills and brickfield owners

##### **i. Sawmills**

There had been a number saw mills in operation in the recent past in the Teknaf area and were used get timber from locality and also from the GR. But recently after the operation of BDR and ceasing 6 saw mills from Hnilla, other saw mills have been closed. At present only two saw mills are in operation in Teknaf bazar which have legal permission and located bit away from the GR. In fact at present theses sawmills owner have a minor indirect stake with the GR. Some influential people of the locality own these mills. These sawmills usually receive both legal and illegal timbers for sawing into the logs. It appears that sawmill owners encourage illegal felling of trees form nearby GR. Sometimes they may have internal linkages with timber traders, FD and illegal fellers. It is also reported that they sometimes help the illegal fellers by giving money in advance.

##### **ii. Brickfields**

There are eight brickfields in the GR area and owned by very influential people. Table 15 shows the distribution of the brickfield within the area. The brickfields consume huge quantity of fuelwood, most of which come from the GR. Most of the brickfields are situated in Leda, Dhuingakata, noyapara, jadimura, leda etc, of which 4 are within the GR area. Almost all fuelwood for the brickfields come from the GR. The brickfield owners buy fuelwood from the local poor people and also in some cases they employ day labor to collect fuelwood from the GR. Therefore, the local brickfields seem to have major stakes with the GR.

**Table 15. Distribution of brick field**

| Sl | Location |              | No of sawmills | Owner                                     | Remarks  |
|----|----------|--------------|----------------|---|--|
|    | Beat     | Villages     |                |   |  |
| 01 | Mouchuni | Moddah Leda  | 01             | Gafur member                              | It seems that located inside but they claim it is on Khas/owned land |
| 02 | Mouchuni | Daksin Leda  | 02             | Ali ahmed<br>Chairman and<br>hasem Member | Do   |
| 03 | Mouchuni | Nayapara     | 01             | Azhar company                             | Do   |
| 04 | Mouchuni | Jadimurapara | 02             | Redyan ahmed<br>and motihazi              | Do   |
| 05 | Whykong  | Dhaingakata  | 02             | Ali ahmed, Abul<br>Hasem member           | Do, It destructed the forest most                                    |

#### 4.3.2.3 Furniture shop owners

There are about 18 furniture shops in the nearby bazaars of GR area, as reported by local people these shops use some illegal timber, and most of which probably come from the GR. The shops are located nearby bazaar, mostly in Jahazpura, Shamlapur, Hnilla, and Teknaf. Also there are some shops in Moulubibazar and Minabazar. Furniture from the area in huge quantity goes to different parts of the country, including Dhaka. Sometimes, the FD check post checks while transporting furnitures but it is not difficult to pass through this checking. The furniture shops have links with the tree feller.

#### 4.3.2.4 Transport maker

A large number of boats operate in Naf River as well as in the sea, mainly for fishing. Given the huge number of boats, a huge quantity of timber is required every year and a major

portion of timber for making the boat come from the GR. Therefore, they have an indirect stake with the forest. Gargan timber is preferred for making boats.

4.3.2.5 Zeep/boat owner

They are usually used for transporting fuelwood and timber and thus have stakes with the forest. They have linkages with poachers.

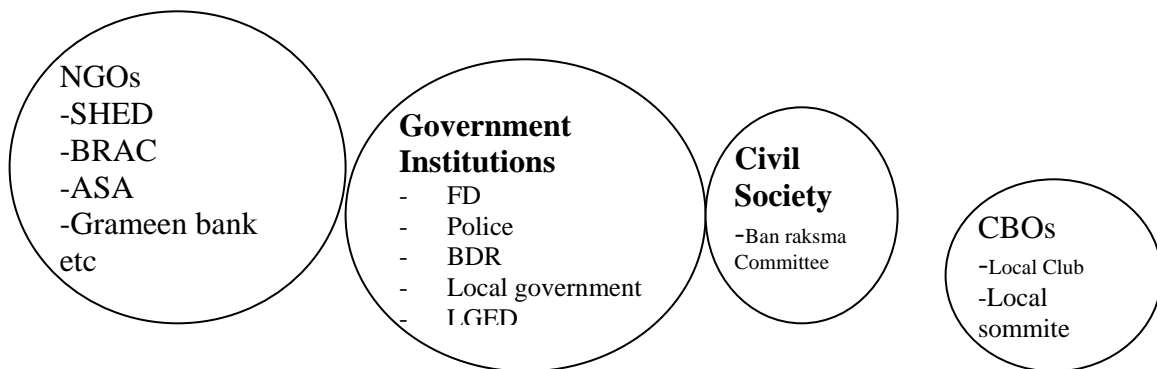
4.3.2.6 Local hotel and tea stall owner

There are hundreds of tea stalls in the area and are located inside the QR or at the edge of the GR or in nearby bazaar or market. They burn fuelwood in their kitchen that come from the forest.

*4.3.3. Institution / Organizational Stakeholders*

Besides the resource based primary and secondary stakeholders, there are a number of institutions and organizations that are involved and have stakes with the GR. Institutional/Stakeholders Analysis are described below.

Based on the nature of the institutions, the institutional SH have been categorized into four types such as NGOs, Government Institutions, Civil Society institutions, CBOs. The relative involvement of different types of stakeholders with local community has shown in the Fig.15.



**Fig.15. Institution relationship and involvement with the GR area**

The figure shows that the community based institution does not have more involvement or interaction, which would create more impact and influence on local villagers as compared to the government agency. The NGOs have more involvement with the local community but the civil society has more involvement with forest conservation. Table 16 shows the

stakeholders analysis of the PRA sites showing their positive and negative roles. Negation and positive impacts of institutions to rural livelihoods are also show in Table 17.

**Table 16. Institutional Stakeholder Analysis in GR**

|                           |  | Positive                     | Neutral               | Negative           |
|---------------------------|--|------------------------------|-----------------------|--------------------|
| Governmental Institutions | <ul style="list-style-type: none"> <li>• Local government (Union parisad, district council)</li> <li>• Police</li> <li>• BDR</li> <li>• LGED</li> <li>• FD</li> <li>• Land administration</li> <li>• SMP</li> </ul>      | √<br><br><br>√<br><br>√<br>√ | <br><br><br><br><br>√ | <br><br>√<br><br>√ |
| Civil society             | <ul style="list-style-type: none"> <li>• Ban Raksma committee</li> <li>• Traditional governance               <ul style="list-style-type: none"> <li>○ Ethnic society</li> <li>○ Forest villagers</li> </ul> </li> </ul> | √                            | <br><br><br>√         | <br><br><br>√      |
| CBOs                      | <b>Local sommite</b><br><b>local club</b>  |                              | √<br>√                |                    |
| NGOs                      | SHED<br>BRAC<br>ASA<br>Grameen bank  | √                            |                       |                    |

**Table.17. Negative and Positive Impacts of Institutions to Rural Livelihoods**

| Positive Impact   | Negative Impact   |
|---|---|
| <b>FD</b> <ul style="list-style-type: none"> <li>• Prevent and control against illegal resouce extraction</li> <li>• Plan to develop forest conservation</li> <li>• operate day to day administration of forest</li> </ul> <b>Police:</b> <ul style="list-style-type: none"> <li>• Serve as social security agent and prevent illegal felling by cooperation with FD</li> </ul> <b>BDR</b> <ul style="list-style-type: none"> <li>• Patrolling around the forest side</li> <li>• cooperate the FD for preventing illegal felling</li> </ul> <b>NGOs</b> <ul style="list-style-type: none"> <li>• Provide skill training and micro credit to the local people</li> </ul> | <b>FD</b> <ul style="list-style-type: none"> <li>• some times make negotiation with illegal feller and land encroacher</li> </ul> <b>Police:</b> <ul style="list-style-type: none"> <li>• collect illegal fee from the fuelwood collector</li> <li>• collect illegal fee from the illegal feller</li> </ul> |

#### 4.3.3.1 Governmental Institutions

##### **i. Forest Department**

FD has the overall responsibility for management, conservation and development of the GR through planting, harvesting, patrolling and guarding the forest resource. The number of forest staff is inadequate for its management. There is an informal forest check post on the Dhaka -Teknaf highway at Damdomia which is an international check post of BDR, established through negotiation with BDR authority. Along with the BDR, one staff from the FD is engaged in this checkpoint to help BDR for pointing the illegal forest products. And another two informal checkpoint one in front of Teknaf range office and another in front of Whykong range office. While the Forest Department as a whole plays a positive role in the protection of the GR, a few FD staff and officials are alleged to be involved indirectly with illegal felling activities and have negotiations with land encroacher. These corrupt staff may negotiate and have informal agreements with illegal timber felling syndicates, timber trader, sawmill & brickfield owners, land encroacher and furniture shop owners. In addition, local people claim FD staff take money (e.g. 10 taka for each entry) from fuelwood and bamboo collectors to allow them to enter into the GR.

##### **ii. Local administration (Local government, LGED, and district council)**

Local Govt. plays a role in communicating and coordinating with outsiders and authorities at national levels. However, the local authority has a low priority in the communication, and coordination roles in this area. Local government such as Union parishad, District Council and IGED are making Road across the forest In Jahazpura a road called DC road has been made and going to be pacca soon which is located inside the GR area. Local government such as Union Parishad & local community also built several social institutions inside the forest for the facilities local elfare services.

##### **iii. BDR and Police administration**

Police and BDR are two main law enforcing institutions who have substantial stake with the forest. Police plays a role in the social security and to prevent illegal resource activities in cooperation with FD. But in PRA it was revealed that the role of police is not positive. Sometimes, they negotiate with tree illegal feller.

Ukia and Tecknaf Police Station have a number of police camp along the GR boundary or at the edge of the forest and thus in a negotiation position with logger and other illicit resource exploiters. However, sometimes, they register some forest cases lodged by the local FD staff

BDR patrols in the border area along the river Naf. This patrolling helps in the protection of the GR. They have also a number of check posts on the Teknaf-Cox's Bazar Highway. They also cooperate FD time to time. Recently BDR has ceased six sawmills and one truck of stone extracted from the GR. Table 18 shows the list of BDR camp near to the GR. There is a great opportunities to involve this camp with the GR conservation.

**Table 18. Location of BDR camps in Teknaf GR**

| <b>Name of BDR camp</b> | <b>Location</b> | <b>Beat</b>  | <b>Location</b>  |
|-------------------------|-----------------|--------------|------------------|
| Damdamia BDR camp       | Damdamia        | Teknaf       | Adjacent         |
| Leda BDR camp           | Leda            | Musoni       | Adjacent         |
| Whykong BDR camp        | Whykong         | Whykong      | Adjacent         |
| Hnilla BDR camp         | Hnilla          | Hnilla       | Near to adjacent |
| Jhimongkhali            | Zimongkhali     | Moidhohnilla | Adjacent         |
| Teknaf BDR camp         | Teknaf          | Teknaf       | Near to adjacent |
| BDR company Head quater | Teknaf          | Teknaf       | Inside           |

#### 4.3.3.2 Civil Society

##### **1. Ban Rakkhya Committees**

There are 3 local committees formed by local people with a view to safeguard the forest in general, preventing illegal tree felling in particular. These committees have been formed under the auspices of the Forest Department, particularly by the interest of the DFO. The committees are located in Hnilla, Whykong and Jahazpura. The Jahazpura Ban Rakkhya committee is a very active and playing an active role in protecting a huge strip of garjan garden in Shilkhali beat. The other two committees are inactive.

The Jahazpura Ban Rakkhya Committee consists of 25 members including FD local staff, representatives from forest villagers and local community, local elites, and some, influential person etc. They guard the forest along with the FD staff and forest villagers. So far, they have been very successful in protecting the said garjan strip. Of the other two inactive committees, Whykong Ban Rakkhya Committee is headed by local Union Parishad Chairman Principal Moulana Nur Ahmad, 4 women are included in that committee. The

other committee ‘Mthabanga Ban Rakhkhya Committee is headed by Master Sukkur. However, the latter two committees virtually exist in papers, but not practical.

#### 4.3.3.3 NGOs and Credit Provider Banks

Table 19 provides information on the NGOs and credit provider banks that operate in the locality. The major NGOs in the locality are: BRAC, ASA, SHED, Besides, Grameen Bank, Krishi Bank and BRDB also operate in the area. 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 for their sustainable livelihoods. IGA programs concentrate on small business, poultry, livestock etc. NGO’s credit is mainly focused on the women. In the western side of the GR, no recognized NGO activities have been observed.

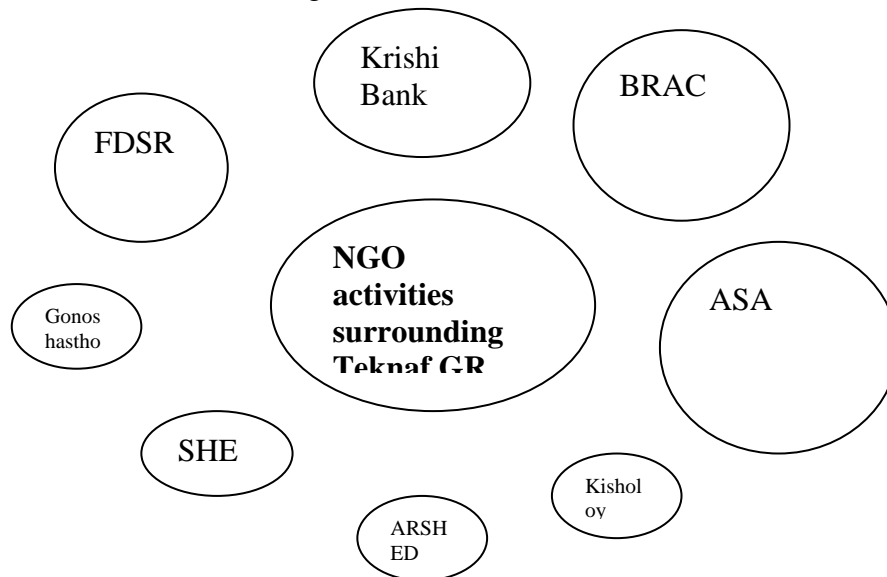
**Table. 19 Information on NGO activities in Teknaf GR**

| Sl | Name of NGO/CBOs  | Area               | Activities  | Remarks          |
|----|---|--------------------|---|------------------|
| 1  | ARSLED (Association for Rural Socio-Economic Development) | Hnilla             | Socio-economic of development, for the local people                                     | H/O-Kharaangkhal |
| 2  | BRAC  | Hnilla, Roikhang   | SEED, Social Forestry, Education, micro credit  |                  |
| 3  | ASA   | Hnilla             | Micro credit  |                  |
| 4  | SHED  | Hnilla and whykong | Disaster management, nitrated, Micro credit and plantation in buffer zone; FSP Partner. |                  |
| 5  | Al Arafah Life Insurance                                  |                    | Savings   |                  |
| 6  | Padma Life Insurance                                      |                    | Savings   |                  |
| 7  | BRDB  | Roikhang           | Micro credit  |                  |
| 8  | Gonoshasta  | Shamlapur          | Health  |                  |
| 9  | Krisholoy   | Hnilla             | Adult Education   |                  |
| 10 | Grameen bank  | Hnilla, Teknaf     | Micr-credit   |                  |
| 11 | Krishi bank   | Teknaf, Hnilla     | Loan  |                  |
| 12 | Far-east Life Insurance                                   | Hnilla             | Savings and micro-credit  |                  |
| 13 | Al Arafah Islami Life Insurance                           | Hnilla             | Savings and micro-credit  |                  |
| 14 | Padma Life Insurance                                      | Hnilla             | Savings and micro-credit  |                  |
| 15 | VERC  | mathabhang a       | Sanitation, safewater   |                  |
| 16 | FDSR  | Whole              | Health- clinic  |                  |



| Sl | Name of NGO/CBOs               | Area    | Activities         | Remarks                       |
|----|--------------------------------|---------|--------------------|-------------------------------|
|    |                                | teknaf  |                    |                               |
| 17 | Ahsania Bonuadi Islami Mission | whykong | Religious teaching | Local NGO based in Cox'sbazar |

NGO activities are insufficient to support the livelihoods of the surrounding village people of GR. More IGA initiatives are essential for the improvement in the local livelihood. Skill development activities by the NGOs are limited. Different NGOs have variable relative influence in the Teknaf area (Fig. 16)



**Fig. 16 shows relative influence of the major local NGOs in the area**

#### 4.3.3.4 Local community organizations and associations

Table 20 provides information on the local community organizations involved with various activities in the locality. Information have been collected on 27 of them, however, number would be more. While some of the CBOs seem to active, the most of them are inactive.

**Table 20. Information on CBOs activities within and around Teknaf GR area**

| Sl | Name of CBOs                 | Area                   | Activities                             |
|----|------------------------------|------------------------|--|
| 1  | Vittihin Co-operative Samity | Keruntalipara, Teknaf. | Savings, co-operative activity for IG. |
| 2  | Damdamia Club                | Damdamia, Teknaf.      | Savings, co-operative activity for IG. |
| 3  | Samajkallayan Club           | Uttar Leda             | Co-operative activity for IG           |
| 4  | Moheshkhali                  | Moidho Hnilla          | Co-operative activity for IG           |

| Sl | Name of CBOs  | Area                               | Activities   |
|----|---|------------------------------------|--|
|    | Muktokonktho Club                                       |                                    |  |
| 5  | Whykong Krishi Somobay Sommitti (Member-20 (F-10,M-10)) | Whykong                            | Credit and savings and IG  |
| 6  | Buddah Sommiti (104 members all are male)               | Whykong &Hnilla                    | Small entrepreneurship dev, savings  |
| 7  | Potibonia Bhumihin Somobay Sommitte                     | Potibonia, Roikhang                | Savings, loan  |
| 8  | Drubo Tara Islamic Unnayan Sommitti (Reg.)              | Jaahzpera                          | Collecting subscription from local people and arrange Islamic religious Mahfil yearly. |
| 9  | Simoon Jubo Kallyan Sommitti (Reg.)                     | jahazpura                          | Credit and Cooperative society   |
| 10 | Samlapur Bazar Sommitti                                 | Samlapur                           | Savings, providing loan, fund generation, welfare activities                           |
| 11 | Bhai Bhai Sangha  | Boro del                           | Collect levy, provide credit to the farmer   |
| 12 | Moresh Bonia Saikat Samaj Kallayan Sangha               | Marishbonia                        | Micro-credit and small business  |
| 13 | Tarun bahar prodip sangha                               | Mathabanga                         | Social welfare   |
| 14 | Komboniapara Jubo kallayan sommitte (33 members)        | Kombonia                           | Savings and business   |
| 15 | Noyabazar Young society (estd. 1999)                    | Moddah Hnilla, Zimangkhali village |  |
| 16 | Noyapara Krishi Somobay sommitte (Reg.)                 | Noyapar                            | Agriculture, credit, savings   |
| 17 | Islami samaj kallayan sommitte, Noyapa                  | Noyapar                            | Inactive   |
| 18 | Bhittahin Sommitte, (Reg)                               | Roikong                            | Savins, credit programs  |
| 19 | tarun Muslim Club                                       | Konapara                           | Organize Islamic Oaz yearly  |
| 20 | Al Amin Foundation                                      | Roikhong                           | Do   |
| 21 | Islami Samaj Kallayan Pathagar                          | Keruntoli                          | Operate religeous library  |
| 22 | Borodel Club  | Borodel                            | Sports and cutural activities  |
| 23 | Holbonia Toronga Club                                   | Holbonia                           | Do   |
| 24 | Sapla Club  | Mathpara/Chakma para               | Savings, sports and cutural activities   |
| 25 | Hilful Fuzul  | Shamlapur bazar                    | Savings, business, religious activities  |
| 26 | Bismillah Club  | Shamlapur bazar                    | Do   |
| 27 | Holbonia Shisu Akadosh Club                             | Holbonia                           | Child development and welfare  |

#### 4.3.4 Demographical types of SH

Information on demographical SHs have also been collected during PRA. Table 21 provides information on the demographical stakeholder types and category, stakeholder description, their activities, dependency, relative level of stakes with the forest and their influence. A total of 12 types of demographical SH stakeholder groups have been identified in the GR area, of them 7 have direct stake with the GR and are involved directly in resource extraction and forest conversion activities, and the rest are indirect stakeholders. Of them, 4 SH groups (Tongchoinga/ Tribal, Rohinga, Forest villagers, local poor people) have major stakes with the forest having major role in forest degradation, while 6 have medium stakes and the rest have minor stakes with the forest. Among these SH groups, 4 SH groups (Rich businessmen; locally so called Company, Local political leader, local elites, land Lord/Jootdar) have high level of influence on the area and GR, on the other hand 4 SH groups have medium level of influence and rest have less influence.

**Table 21. Information on the demographical stakeholders of Teknaf GR**

| Sl no. | Stakeholder (SH) name                        | SH category | SH Description                       | Role/Description of activities of SH  | Dependency for livelihood  | Level of stake | Influence |
|--------|--|-------------|--------------------------------------|---|--|----------------|-----------|
| 1      | Tongchoinga/<br>Tribal                       | Direct      | Tribal forest villagers              | Collect fuel wood, housebuilding materials & hunting wild lives especially wild boar.   | Many HHs entirely dependent on GR<br>Many depend partly on it for their livelihood | Major          | Less      |
| 2      | Rakhain                                      | Indirect    | Tribal, Indigenus people             | In previous they were the land lord of this area. But now minority, they collect fuelwood and hunted wild boar  | Less dependent   | Minor          | Less      |
| 3      | Rich Businessmen (Locally so called Company) | Indirect,   | local rich businessmen, dadoner etc/ | They appoint labour by <i>MATHA Killa</i> rules for the whole year. But when those labour has no work they send them to forest to collect timber and fuel | Less dependent   | Medium         | High      |

| Sl no. | Stakeholder (SH) name    | SH category | SH Description           | Role/Description of activities of SH   | Dependency for livelihood                              | Level of stake | Influence |
|--------|--------------------------|-------------|--------------------------|--|--|----------------|-----------|
| 4      | Middle man               | Indirect    | local middleclass        | They purchase different resources from direct collector and also act as a agent of timber merchant or fuelwood traders                                   | Partially dependent                                    | Medium         | Medium    |
| 5      | Rohinga                  | Direct      | (refugees from Burma)    | Encroaching forest lands, enter into forest by doing marriage  | Partially dependent                                    | Major          | Less      |
| 6      | Robber                   | Direct      | Bandits, men             | Tree feeling, robbery of public wealth.  | Less dependent   | Medium         | Medium    |
| 7      | Forest villagers         | Direct      | living inside the forest | Collect resources from the forest, some times help FD in plantation and patrolling   | Entirely dependent                                     | Major          | Medium    |
| 8      | Local political leader   | Direct      | Influential people       | Encourage & provide shelter to the local people in illegal extraction of resources   | Less dependent   | Minor          | High      |
| 9      | Local elites             | Indirect    | Influential people       | Encourage & provide shelter to the local people in illegal extraction of resources   | Less dependent   | Medium         | High      |
| 10     | Local poor people        | Direct      | day labourer, landless   | Collect fuelwood and other resources   | Entirely dependent                                     | Major          | Less      |
| 11     | Land Lord/ <i>Jotdar</i> | Indirect    | Influential people       | They encroached a large scale of land into the forest. And they give lease it to the landless cultivator in 2 process: 2000Tk per Acres or sharing crops | Partially dependent                                    | Medium         | High      |
| 12     | Headman                  | Direct      | Head of forest villagers | Encroached land, some of them have positive role also  | Entirely dependent                                     | Medium         | Medium    |
| 13     | Farmer/tiller            | Primary     | Poor people and Forest   | Usually the tiller encroach plain land and cultivate various crops in the forest   | Entirely dependent on forest land; and for agriculture | Major          | Medium    |

| Sl no. | Stakeholder (SH) name | SH category | SH Description | Role/Description of activities of SH | Dependency for livelihood | Level of stake | Influence |
|--------|-----------------------|-------------|----------------|--------------------------------------|---------------------------|----------------|-----------|
|        |                       |             | Villager       | land                                 |                           |                |           |

Some of these demographical SHs description is given below:

#### **i. Rich businessmen**

They employ poor people for their agriculture and HH works on a yearly basis. When they do not have work during certain periods of the year they are usually sent to the forest to collect fuelwood or to level some forest land for grabbing.

#### **ii. Middlemen or merchandise**

Usually they are mainly involved with trading of many forest produce, including fuelwood, timber and others.

#### **iii. Robber**

In inside & the surrounding area of the GR there are some armed bandit groups or robber. Sometimes, they raid the local forest offices and pose threats to forest management. Recently, one of the bandit groups killed the Beat Officer of Maddahnilla. They also help the tree poacher on negotiation.

#### **iv. Tongchoinga**

The Tongchoinga is local ethnic community and are dependent on the GR for many of their HH needs. They also do shifting cultivation which is detrimental to forest and its biodiversity. In short, their livelihood is dependent on the forest.

#### **iv. Rakhain**

Rakhain are another ethnic community live adjacent to the GR. They also use the forest, but not a scale that is done by the Tongchoinga. They usually collect fuelwood and hunt the wildlife.

#### **v. Local poor people**

The local poor people are mostly dependent on forest for their livelihood. Most of them live on forest land and collect various resources such as fuelwood, vegetables etc for both of their domestic use and commercial purpose.

#### **vi. Rohingas**

There are about 450 families, mainly in Shamlapur, Jahazpura, Teknaf, Hnilla) who have migrated here from Myanmar. They have encroached land, sometimes some influential persons of the area engaged them as day labour for cutting wood from the forest. Most of them are mainly dependent on sea but they also collect forest resources as a means of their secondary sources income. They also collect sungrass and fuelwood from the forest.

#### **vii. Local elites**

Local elites include influential persons and are socially recognized. These people have control over the GR as well on the local administration. There are the people who are center for local conflict resolution. In teknaF GR area local elites including the politician are very influential and have stake with the GR. Sometimes, they favour the illicit forest users. Sometimes they also interfere with forest management. Sometimes, some of them have links with tree poachers. They are also involved with forest land encroachment.

#### *4.3.5 Status and role of forest villagers and ethnic community*

##### **i. Forest villagers**

Forest villages were established during mid 1920's by the Forest Department and allotted with 2 acres of land to each family. In return, the villagers are expected to help the Forest Department on the plantations and undertake other duties such as regular patrolling. The PRA investigated whether they comply with the agreement and the dependence and activities of the forest villagers related to forest degradation and conservation.

Initially there were about 30-40 HHs of forest villagers in each beat. However, the number has increased enormously. The total number of registered and enlisted forest villagers now stands to about 350 in the GR. However, this number would be far behind the actual. As per local people perception the number of people claiming to be forest villagers would be near about 5000 HHs. FD listed them as encroachers. They are mainly descendant of forest villagers and/or their relatives. There are evidences that some forest villagers pursue other people to come to their settlement areas and help him in grabbing land, in return they take some money from him, even they lease out their land position to the Rohingyas to establish households. At present there is no rules and regulation for controlling the forest villagers. In some cases it was found that by the way of negotiation with local FD staff especially with

range officer, the headman encroach a large area of land. In addition to homestead area the forest villagers also grab land for agricultural purposes.

While there is minimal encroachment around Forest villages in the northern forests, many villages inside Teknaf and Hnilla have slowly expanded into the surrounding forest area. It is reported by local people that the majority of these encroachers in the southern forests pay a sum of money to the local Forest Department Beat Officer to avoid a forest case being written against them.

It is locally held that the so-called forest villagers cause most harm to the GR. All of the forest villagers are fully dependent on forest for their livelihood. All the HHs in those villages which are located in and at the edge of the GR are dependent on fuelwood, house building materials and some vegetables from the forest for their HH needs. FGD suggests that they depend on the forest for many of their daily HH needs and they also use the forest for added income. Most forest villager's HH are involved with fuelwood and bamboo collection, betel leaf cultivation. They are in a advantageous position being located within the forest areas.

While they enjoy the benefits from the forest, but presently they have little compliance to the agreement with FD. However, they try to maintain a good relation llocal FD staff.

The forest villagers expect to get some more lands for establishing new HHs for their expanding family members, also they have some expectation from the project that NSP should provide some support to improve their livelihoods.

## **ii. Rohingya**

At present one of the major concerns for the GR is Rohinga issue. Rohingyas are Arakanese Muslims. They have migrated from Myanmar to Bangladesh due to a political crisis there. The Rohingyas have been an international refugee issue at Myanmar-Bangladesh border since 1978.

Several camps were established for them in Teknaf, Cox's bazaar and other Hill Tract areas besides, these refugee camps they also have settled down in many placesx's bazaar area of Bangladesh, Particularly in forested areas. Although repatriation has started long back still about 2000 registred refugees are wairting. There are two camps, called Nyapara refugee

camp-1 & 2, located inside the GR. However, there are many more Rohingya HHs remain outside of the camps, particularly in the western part of the GR. Table 22 shows the distribution of Rohingyas in the area. Table 23 presents the villager wise distribution of Rohingya at shamlapur.

**Table 22 Information on Rohingas settlements (legal and illegal) in and around Teknaf GR**

| Sl no | Location                         | Beat          | No of HHs | Remarks   |
|-------|----------------------------------|---------------|-----------|---|
| 1     | Shamlapur                        | Shamlapur     | 700       |   |
| 2     | Noyapara Rohingya Camp (1&2)     | Mochuni       | 3500      | 20000   |
| 3     | Ledha                            | Mochuni       | 4000      | 28000, Locally it is called the Capital for the Rohingas. |
| 4     | Dhamdhamia                       | Mochuni       |           |   |
| 5     | Jadhimura                        | Mochuni       | 196       |   |
| 6     | Kutubdia para                    | Moidho Hnilla | 60        |   |
| 7     | Moheshkhali para                 | Moidho Hnilla | 413       |   |
| 8     | Khareng khali                    | Moidho Hnilla | NA        |   |
| 9     | Aamtoli                          | Whykhong      | NA        |   |
| 10    | Horikhola                        | Whykhong      | NA        |   |
| 11    | Laturikola                       | Roikhong      | NA        |   |
| 12    | Katakhali                        | Whykhong      | NA        |   |
| 13    | Lombagona                        | Whykhong      | Na        |   |
| 14    | Keruntoli, Gilatoli & Chakmarkul | Whykong       | 200       |   |

**Table 23. Information on Rohingya (Refugee) at Shamlapur**

| Sl no | Name of Para                    | No of HHs |
|-------|---------------------------------|-----------|
| 1     | Horibon para                    | 130       |
| 2     | Barma para (north side of road) | 190       |
| 3     | Mohis Khaillapara               | 60        |
| 4     | Nesari para                     | 100       |
| 5     | Hatkhola para                   | 150       |
| 6     | Aachar bunia                    | 90        |
| 7     | Moratola para                   | 100       |
| 8     | Hazi Salam colony               | 12        |
| 9     | Farmecy Mamtaj colony           | 30        |
| 10    | Pahartola                       | 20        |
| 11    | Dhalar mukh                     | 8         |



The Rohingyas are mostly dependent on the forest resources. They collect fuelwood and other resources for selling. Many of them are employed by rich local people to collect various forest resources. They are also now involved with tree poaching as employed labour. It is generally held that a huge degradation has taken place after the migration of Rohingya to Bangladesh.

### iii. Ethnic Community

There are two ethnic communities, Rakhain and Tongchoinga located within and around the GR. Once the Rakhain, popularly known as Mogh, was the majority of the area. But at present they have become minority. On the other hand, the Tongchoinga's are settled here as forest villagers during British rule. Comparatively, Tongchoinga have more stakes with the forest than the Rakhain community. They live mainly inside the GR as recognized forest villagers while the Rakhain tribe lives outside or adjacent area of the GR. Table 24 shows the settlements distribution of the two ethnic tribes that live in and adjacent to the GR.

The major occupation of Tongchoinga are fuelwood collection, agriculture, day labourer etc on the other hand, most of the Rakhain are involved with fishing in Naf river. Their main occupation is betel leaf cultivation, followed by day labor. The Tongchoinga has traditional practice of Jum cultivation inside the forest. Both the communities traditionally used to hunt almost all types of wild animals for their own consumption. Perception grew as that these two communities causing a great harm to the forest biodiversity.

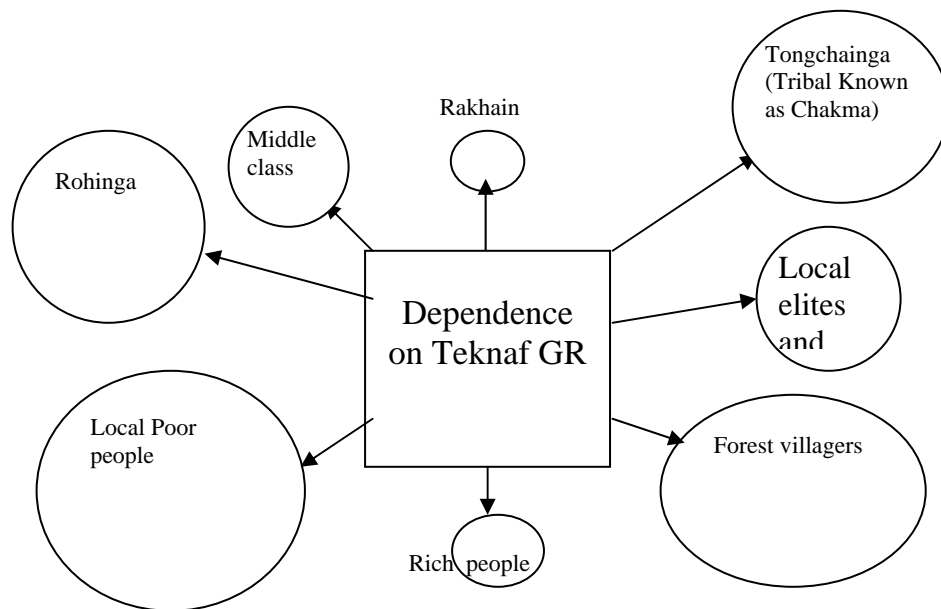
**Table 24 Information on Rakhain & Tonchainga in Teknaf GR area**

| Sl no | Location       | Rakhain/Tonchainga |
|-------|----------------|--------------------|
| 1     | Chowdhury para | Rakhain            |
| 2     | Hnilla         | Rakhain            |
| 3     | Moulovi Bazar  | Rakhain            |
| 4     | Dhamdhamia     | Rakhain            |
|       | Jadhimura      | Rakhain            |
| 5     | Khareng khali  | Rakhain            |
| 6     | Aamtoli        | Rakhain            |
| 7     | Horikhola      | Rakhain            |
| 8     | Laturikola     | Rakhain            |
| 9     | Katakhali      | Rakhain            |
| 10    | Lombagona      | Rakhain            |
| 11    | Combonia       | Rakhain            |
| 12    | Unchiprang     | Rakhain            |

|    |           |            |
|----|-----------|------------|
| 13 | Monkhali  | Tonchainga |
| 14 | Shilkhali | Tonchainga |

#### 4.3.6. Dependency of the Stakeholders on the Forest Resources

Traditionally, the local people are used to collect various resources from the GR. Local brickfields are almost entirely depend on the GR for the operation of brick field. Local sawmills and furniture shops depend to some extent on the legal and illegal timber from the forests. However, their livelihood is not dependent on the supply of timber from the GR. Similarly, the illegal feller, who are involved with tree felling, are not also dependent on the timber from GR forest for their livelihood, but do it for added income. However, the local poor people employed by the illegal feller and involved with illegal felling are entirely or partly dependent on the activity for supporting their livelihood. On the other hand the Tongchoinga tribe, popularly known as Chakma, an ethnic tribal community, is entirely dependent on the GR and its resources for their livelihood.



**Fig. 17. Relative level of dependence by major stakeholders groups (demographically)**

Fig. 17 shows the relative level of dependence of different groups of people (demographically) on the forest, i.e. the pressure exerted by the stakeholders on the forest. It is apparent from the figure that the local poor people including the forest villagers and one ethnic group Tongchoinga are dependent on the forest and at the same time they are the people causing most harm to the forest. The Rohingas also have a large dependency on forest and their livelihood is mostly dependent on resource extraction from the forest.

Table 25 provides information on 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 forest for their HH needs. But, they also collect for commercial purpose. Many poor people including tribal completely dependent on selling of fuelwood and many of them sell it for added income. As revealed from FGD with local people that about 10-15% people of the villages located inside the GR 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.

**Table. 25. Resource wise dependence of different resource users**

| Sl | Name of Resources | Reason for resource Exploitation  | Users   | Extent   | Dependency of localities | Risk  |
|----|-------------------|---|---|----------|--------------------------|---|
| 1  | Fuel Wood         | Both for commercial and HHs use, as main sources of fuel  | Tribal, Local people, tea stall & hotel owner, Brick fields       | Moderate | High                     | High  |
| 2  | Timber            | Commercial & HHs use as building materials  | Local people, outsider, syndicate, Boat and furniture shops owner | Moderate | Moderate                 | High, selectively the tall trees are feeled           |
| 3  | Sun grass         | Both for Commercial and HHs consumption as building materials   | Local people  | High     | Moderate                 | Low but habit of fox and other animals are decreasing |
| 4  | Bamboo            | As raw material of handicrafts, poles, fencing, basket and others, fuel, betel leaf cultivation and poles for fishing in seas | Local people, fisherman, beta leaf cultivator, outsider people    | Low      | Moderate                 | Moderate  |
| 5  | Cane              | Commercial & HHs use for handicrafts  | Local people, furniture makers                                    | Less     | Low                      | Low   |
| 6  | Medicinal Plants  | As medicine, commercial consumption   | Local People, traditional healer, outsider researcher group       | Less     | Low                      | Low   |
| 7  | Honey             | Both commercial and HHs   | Local People  | Less     | Negligible               | No risks  |

| Sl | Name of Resources | Reason for resource Exploitation   | Users                                      | Extent    | Dependency of localities | Risk       |
|----|-------------------|--|--|-----------|--------------------------|------------|
|    |                   | consumption, used as Food, medicine                                      |  |           |                          |            |
| 8  | Herbs & Shrubs    | As vegetables and also as alternative of rope                            | Local People, small businessmen            | high      | Low                      | Low        |
| 9  | Bird              | Both Commercial and HHs consumptions, For meat (wild fowl, pigeon etc.)  | Local People                               | Very less | Very low                 | High risks |
| 10 | Deer              | Commercial and HHs consumption for eating                                | Hunter, Tribal                             | Low       | Low                      | High       |
| 11 | Wild Boar         | HHs consumption, Meat as food  | Tribal, (indigenous people)                | Very Less | Low                      | Less       |
| 12 | Monkey            | Killing or catching for disturbing in paddy cultivation and fruits.      | Hunter, local people                       | Less      | -                        | -          |
| 13 | Fruits            | Maximum for HHs Consumption and also for Commercial purpose, as Food     | Local People, Tribal Birds, Monkey         | Very Less | Low                      | Less       |
| 14 | Vegetables        | HHs consumption as Food  | Local People especially women and children | Less      | Low                      | Less       |
| 15 | Grass/ fodder     | HHs consumption, For Cattle feeding                                      | Local People and cow boy                   | Less      | Moderate                 | Less       |
| 16 | Sand              | Commercial purpose,  | Influential person through poor day labour | Less      | Low                      | Moderate   |
| 17 | Stone             | Commercial purpose, used for road construction and as building materials | Influential merchant, syndicate            | Moderate  | Low                      | High       |
| 18 | Dry leaf          | Both for HHs & commercial purpose  | Children & women                           | High      | Moderate                 | low        |
| 19 | Green leaf        | Own use, also commercial purpose, used as packaging materials            | Young men, Fishermen                       | High      | Moderate                 | Low        |
| 20 | Snake             | Both for HHs (for eating) &  | Tribal, snake charmer                      | Low       | Low                      | High       |

| Sl | Name of Resources             | Reason for resource Exploitation  | Users                   | Extent       | Dependency of localities | Risk |
|----|-------------------------------|---|-------------------------|--------------|--------------------------|------|
|    |                               | commercial purpose (for selling), also killed as harmful animal                             |                         |              |                          |      |
| 21 | Tree branches and young trees | Use as poles for setting fishing gear in the beach and also use as post of homestead fences | Fisherman, local people | High in west | Moderate                 | High |

A large number of HHs of the identified villages depends on the extraction of fuelwood and building materials from the forest. It is the poor who collect these resources, mainly for their HHs consumption and also for selling. Thus many poor HHs are dependent on the collection of fuelwood, bamboo and other building materials for supporting their livelihood.

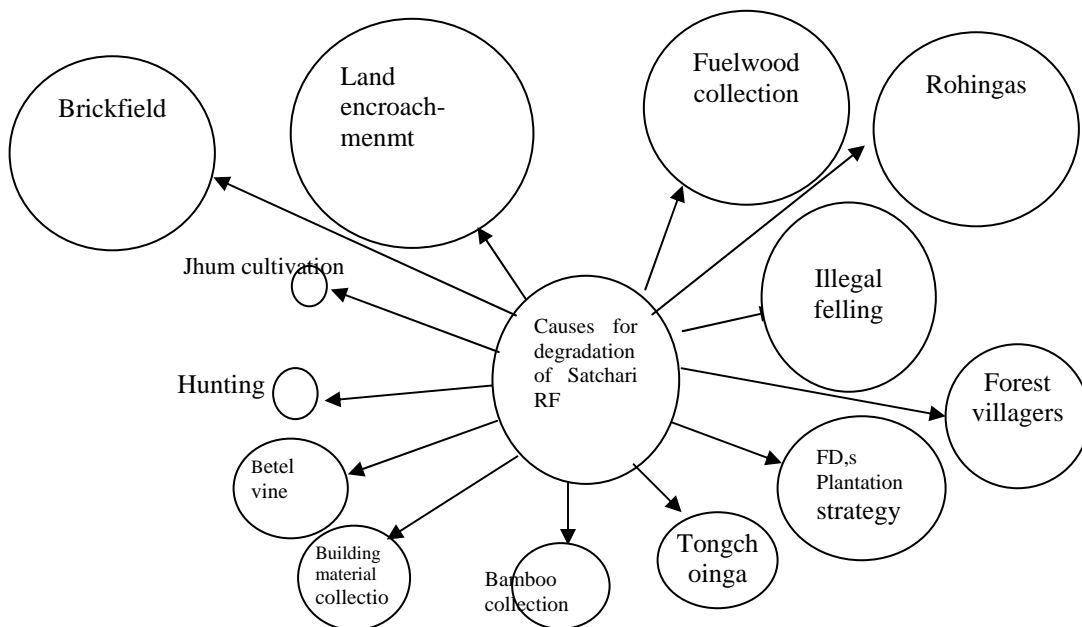
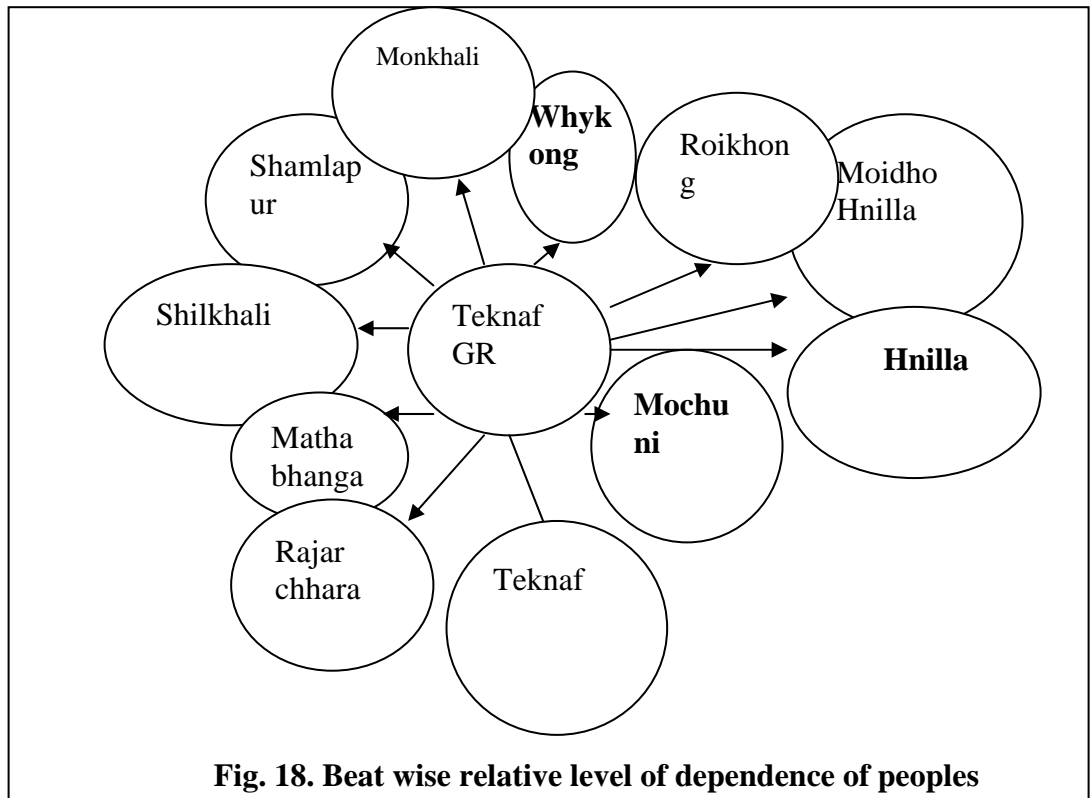
Fig. 18 shows the beat wise relative level of dependence of people on the forest. The figure shows that of the 11 beats, people of Teknaf, Mouchuni, Hnilla and Moddahhnilla have greater dependency on forest

## 4.4 Causes for the Decline in Forest Resources

### 4.4.1 General causes

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. 18. The major causes for the decline in forest in order of magnitude are as follows: land encroachment, Rohingya settlement and pressure, illegal timber felling, FD's plantation strategies, fuelwood collection, collection of house building materials, hunting, betel vine collection, Jhum cultivation, bamboo and cane collection, brickfield operation etc.

Pairwise ranking (Table 26) exercises showed that presently land encroachment is the major cause for the decline in forest biodiversity, followed by illegal timber felling, rohigas issue, fuelwood collection, brickfield operation and bamboo collection. Presently, hunting contributes negligibly to the degradation of the GR, as the activity is very limited. The role of FD's plantation strategies for the forest degradation has not been explored.



**Table 26. Pair wise ranking for identifying main causes of forest destruction**

|                           | <b>Fuelwood collection</b> | <b>Timber felling</b> | <b>Bamboo collection</b>  | <b>House build. mat</b>   | <b>Rohingas</b> | <b>Land encroachment</b>  | <b>Hunting</b>            | <b>Brick field operation</b> |
|---------------------------|----------------------------|-----------------------|---------------------------|---------------------------|-----------------|---------------------------|---------------------------|------------------------------|
| Fuelwood collection       | ----                       | Timber felling        | Fuelwood collec.          | Fuelwood collec.          | Rohingas        | Rohingas                  | Fuelwood collec.          | Brick field                  |
| Timber felling            | Timber felling             | -----                 | Timber                    | Timber felling            | Land encroach   | Brick field               | Timber felling            | Brick field                  |
| Bamboo collection         | Fuelwood collec.           | Timber felling        | -----                     | Land encroachment         | Brick field     | House build. mat. collec. | Bamboo collec.            | Rohingas                     |
| House build. mat. collec. | Fuelwood collec.           | Timber felling        | House build. mat. collec. | -----                     | Rohingas        | Land encroachment         | House build. mat. collec. | Land encroach                |
| Hunting                   | Fuelwood collec.           | Timber felling        | Bamboo collec.            | House build. mat. collec. | Rohingas        | Fuelwood                  | -----                     | Land encroach                |
| Rohingas                  | Bric field                 | land encroachment     | Rohinga                   | Rohingas                  | ---             | Timber feeling            | Rohigas                   | fuelwood                     |
| Land encroachment         | Land Encroach              | Land Encroachment     | Land encroachment         | Rohingas                  | Land Encroach   | -----                     | Timber feeling            | Brick field                  |
| Brick field operation     | Brick field                | Brick field           | Brick field               | Rohingas                  | Brick field     | Land encroach             | Brick field               | ---                          |
| <b>Score</b>              | <b>09</b>                  | <b>10</b>             | <b>01</b>                 | <b>04</b>                 | <b>10</b>       | <b>11</b>                 | <b>00</b>                 | <b>07</b>                    |
| <b>Rank</b>               | <b>04</b>                  | <b>02</b>             | <b>07</b>                 | <b>06</b>                 | <b>02</b>       | <b>01</b>                 | <b>08</b>                 | <b>05</b>                    |

In order to investigate the underlying factors responsible for undertaking of these forest degradation activities by the local people Cause and Effect Ranking exercise was done and the outcomes are shown in Table 27 and Table 28. The exercises revealed that local poverty and unemployment are the main driving factors for the extraction of forest resources, followed by Rohingya issues; additional income needs and squeezed income opportunities. Excessive forest cases lodged by the FD and scarcity of some local resources are also driving the people for increased timber felling (Table 27.). Sawmill operation also increased timber felling where as brickfield operation and Rohingas issues lead to fuelwood collection.

**Table 27. Cause and Effect –Ranking (understanding underlying facts for forest degradation)**

| <b>Name of resourcee<br/>Identified<br/>problems</b> | <b>Timber to<br/>sell</b> | <b>Fuelwood<br/>collection</b> | <b>Bamboo<br/>&amp; cane<br/>sell</b> | <b>Land<br/>encroachment</b> | <b>Hunting</b> |
|--|---------------------------|--------------------------------|---------------------------------------|------------------------------|----------------|
| Poverty  | 000                       | 000                            | 00                                    | 000                          | 0              |
| Unemployment   | <b>0000</b>               | 0000                           | 0                                     |                              |                |
| Additional income<br>needed                          | 000                       | 00                             | 00                                    | 0                            | 0              |
| No resource for<br>house building.                   | 0                         |                                | 0000                                  | 000                          |                |
| Income<br>opportunities<br>squeezed                  |                           | 000                            |                                       |                              |                |
| HHs consumption                                      | 0                         | 00000                          | 000                                   | 0000                         | 0              |
| Marketing<br>opportunities dev                       | 00                        | 000                            | 0                                     |                              |                |
| Emerged as new<br>income generation<br>activity      |                           | 00                             | 000                                   |                              |                |
| Brick Field  | 000                       | 00000                          |                                       |                              |                |
| Sawmill  | 0000                      |                                |                                       |                              |                |
| Betel leaf   |                           |                                | 00000                                 | 0000                         |                |
| Rohingas issues                                      | 000                       | 0000                           | 00000                                 | 00000                        |                |
| Jhum cultivation                                     | 0                         | 00                             | 00                                    | 0000                         |                |
| Forest cases   | 0000                      | 00                             | 0                                     | 000                          |                |

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. Fuelwood collection has been linked to development of transportation system and marketing opportunities, land encroachment has been linked with easy negotiation and lack of control over forest by FD and decreased control over forest villagers by FD (Table 28).

**Table. 28 Cause and effect (investigating FD's management practice and local situation)**

| <b>Practice/management<br/>practice</b> | <b>Timber<br/>to sell</b> | <b>Fuelwood<br/>collection</b> | <b>Bamboo<br/>and cane<br/>coll.</b> | <b>Land<br/>encroachment</b> | <b>Hunting</b> |
|---|---------------------------|--------------------------------|--------------------------------------|------------------------------|----------------|
| Poor forest patrol                      | 000                       | 0                              | 00                                   |                              |                |
| Easy negotiation                        | 000                       | 0                              |                                      | 00000                        |                |
| Lack of control over<br>forest by FD    | 000                       | 0                              | 0                                    | 0000                         |                |
| Transportation dev.                     | 00                        | 0                              | 0                                    | 00                           |                |



|   |       |       |   |       |  |
|---|-------|-------|---|-------|--|
| Traditional practice                    | 0     | 000   | 0 | 000   |  |
| Increased role of influential people    | 00000 |       |   | 00000 |  |
| Decreased control over forest villagers | 00    | 00000 | 0 | 00000 |  |

#### 4.4.2 Other causes for forest degradation

##### **i. Betel leaf cultivation**

There are about thousands of betel leaf yards located inside the GR. It is extensively cultivated in the west side of the GR, sepecially in Shaplapur, Shilkhali, and Jahazpura etc. A number of local people are dependent on betel leaf cultivation for their livelihood. The process of betel leaf cultivation includes temporary encroachment of land, in the way of with making arrangement with the FD. For establishing a Betel vine plot a number of resources are exploited from the forest such as bamboo, little trees, sungrass etc.

Local middleclass and rich people including the forest villagers are involved with this activity. It seems to be more profitable than paddy cultivation; human interest towards betelvine cultivation has increased tremendously. It was revealed from an FGD with the betel vine cultivator in Jahazpura, that during pre-liberation period there was only 2 beltel vine boros but at present there are about about 2000 boros in the GR. According to the local people one can easily make good profit from a boros.

The cultivation period of betelvine extends from Bhadra to Chaitra or jaista. A variety of resources are needed for culvating betelvine such as land, sapital, sapling vine, bamboo spikes, bamboo sticks, sungrass, cowdun., black and white (urea and other chemical fertilizer), water for irrigation, vine and green leaf for packaging after each harvesting.. Usually the villagers are engaged, but who have no land (ligel or illegal) need to rent for cultivation. The cultivator pays 1000 taka to the landowner for one koni of land and for big boros it needs to pay a levy of 1000 tk to FD and for small boros is amount is 500 tk for per season.

Just after two months of planting saplings, the cultivator can harvest regularly at an interval of 8 to 10 days. The average size of each boros is about 70 to 90 kora (120 kora equal one

kani) or 7-8 gonda. Usually the middleclass and rich people borrow money from the money lender at a high interest rate.

## **ii. Grazing of Domestic Animals into the forestlands**

Grazing pressure is greatest in the GR, mainly because more people live in and around the forest areas. Forest land also encroached seasonally by the surrounding villagers for livestock grazing. It was found from the RRA that almost all the HHs have got some livestock. Grazing of cows, buffalo and goats reduces the natural regeneration of plant species, and is thought to have a particular impact on the regeneration of bamboo species. Grazing occurs particularly during the rainy season when there is no rice straw on which to feed the animals. In Hnilla, Whykong and other places of the area, during the monsoon and rice cultivation period, people leave and release their livestock especially buffalo inside the forest.

## **iii. Natural disaster**

Natural disaster such as cyclone made a serious impact on forest resources. Many of trees have been destroyed during the cyclone of 91 & 94. In 91 & 94 Cyclone damages a lot of tall trees and a large number of wildlife had also died.

## **4.5 Exploitation of Forest Resources**

A summary of information collected on resource exploitation from Teknaf GR is provided in Table 29. A total of 18 different types of resource are extracted from the forest, such as timber, fuelwood, bamboo, vegetable, sun grass, fodder, sand, stone, fruits (Kaogola, Chapalish, Latkan), wild fowl, fish, dry and green leaf etc. Of them, timber, sun grass and fuelwood are extracted on a large scale, bamboo and building materials on a medium scale, wildlife, fruits, vegetables, etc. on a minor scale, while honey, cane, medicinal plants on a negligible scale. Fig 19 shows the major resource extraction zones of the GR.

The main purposes for resource extraction include meeting HH needs, selling for added income/and or to support and supplement livelihood. Ethnic community people, local poor people, Rohingya and forest villagers are the major categories of resource user groups.

It was revealed from HHs interview that most of the local people (about 80%) collect bamboo, wood, fuelwood (tree branches & dry leaves) & sun grass from the GR, followed by fruits by 8% people, cane by 5%, bark of trees by 2%, vegetables (5%) from the GR. Besides, stone/pebbles and sands are also collected from the forest. About 87% HHs informed that they collect resources directly from forest and only 13% of them purchase or collect it from others.

On the basis of resource consumption, as revealed from HHs interview that in 30% cases, people collect resources from forest for own/domestic consumption and 70% for commercial and HH purposes. About 70% fuelwoods are collected for domestic consumption. About medicinal plant use, only 30% households informed that they use medicinal plants from forest, whereas 70% do not. Most of the people even don't know about the use of medicinal plants. About 17% household think that the abundance of medicinal plants is still good, while the rest 83% think that its abundance has declined.

Timber felling, fuelwood and bamboo collection, collections 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. Table 29 provides some relevant information on the uses and level of extraction of various resources and their possible risks on the forests and its biodiversity.

**Table. 29. Uses of different resources and its risks on the forest and its biodiversity of Teknaf GR**

| Sl | Name of Resources | Users                             | Causes  | Extent | Dependency on resources | Risk                                       |
|----|-------------------|-----------------------------------|---|--------|-------------------------|--|
| 01 | Timber            | Saw mill owner                    | Business Purpose                                  | Medium | 0000                    | High risk and an alarming threat to forest |
|    |                   | Furniture Shops                   | Business Purpose                                  | Medium | 0000                    |  |
|    |                   | Timber trader                     | Business Purpose                                  | Medium | 00000                   |  |
|    |                   | Local People                      | Household use as furniture and building materials | High   | 000                     |  |
| 02 | Fuelwood          | Local household                   | Domestic use, selling for livelihood              | High   | 00000                   | High risks                                 |
|    |                   | Local tea stall/restaurant owners | Burning in tea stalls                             | Medium | 0000                    |  |

| Sl | Name of Resources | Users   | Causes  | Extent    | Dependency on resources | Risk        |
|----|-------------------|---|---|-----------|-------------------------|-------------|
|    |                   | Local Brickfields owners                              | Burning in brickfields                              | High      | 0000                    |             |
|    |                   | Outside household users                               | Domestic use  | Medium    | 0                       |             |
|    |                   | Outside tea stall/restaurant owners                   | Burning in tea stalls                               | Very less | 0                       |             |
|    |                   | Sold in local market                                  | Purchase by the traders                             | High      | 000                     |             |
| 03 | Bamboo            | Local users   | As poles, fencing, ceiling, basket, fuel and others | Medium    | 0000                    | High risks  |
|    |                   | Outside users   | As poles, handicrafts, fencing, and others          | Very less | 00                      |             |
| 04 | Cane              | Local users   | Basket binder / others                              | Less      | 0                       | Less risks  |
| 05 | Medicinal Plants  | Local People, a few traditional healer called Kabiraj | As medicine   | Less      | 00                      | Less risks  |
| 06 | Honey             | Local People  | Food, medicine                                      | Less      | 0                       | Less risks  |
| 07 | Bird              | Tribal community                                      | For meat (wild fowl, Ghughu)                        | Very less | 0                       | High risks  |
| 8  | Fruits            | Local People  | Food  | Very Less | 0                       | Less        |
| 9  | Vegetables        | Local People  | Food  | Less      | 0                       | Less        |
| 10 | Grass             | Local People  | For Cattle feeding                                  | Less      | 00                      | Less        |
| 11 | Sand              | Businessmen   | Business Purpose                                    | Less      | 00                      | Less risk   |
| 12 | Stone             | Businessmen   | Business Purpose                                    | Less      | 000                     | Medium risk |
|    |                   | Local people  | As house building materials                         | Very Less | 0                       |             |
| 13 | Sungrass          | Local people  | As house building materials & also for sell         | High      | 0000                    | Less risk   |
|    |                   | Betel leaf cultivator                                 | For making shed of boros nad alsp for fence         | Medium    | 000                     |             |
|    |                   | Outsider people                                       | HH consumption                                      | Less      | 0                       |             |
| 14 | Dry Leaf          | Local people  | As fuel/ HH consumption                             | Less      | 000                     | Less risk   |

| <b>Sl</b> | <b>Name of Resources</b> | <b>Users</b>      | <b>Causes</b>            | <b>Extent</b> | <b>Dependency on resources</b> | <b>Risk</b> |
|-----------|--------------------------|-------------------|--------------------------|---------------|--------------------------------|-------------|
|           |                          | Local people      | Commercial purpose       | Less          | 00                             |             |
| 15        | Green leaf               | Fisherman         | Own consumption          | Less          | 0000.                          | Less risk   |
|           |                          | Businessman       | Packaging goods          | Less          | 000                            |             |
| 16        | Vine/herbs               | Local people      | As alternate of rope     | Less          | 000                            | Less risk   |
|           |                          | Small Businessman | Do                       | Less          | 00                             |             |
| 17        | Wild boar                | Tribal            | Domestic purpose as food | Medium        | 000                            | Medium      |
| 18        | Snake                    | Snake Charmer     | Professional Purpose     | Less          | 00                             | Medium      |
|           |                          | Tribal            | Domestic purpose as food | Less          | 0                              |             |

# Teknaf GR

## Resource Extraction Zones

(not to scale)



### Legend








-  Range Office
-  Beat Office
-  Chara (Poaching route)
-  Road. (Poaching route)
-  Bamboo
-  Sungrass
-  Fuel Wood

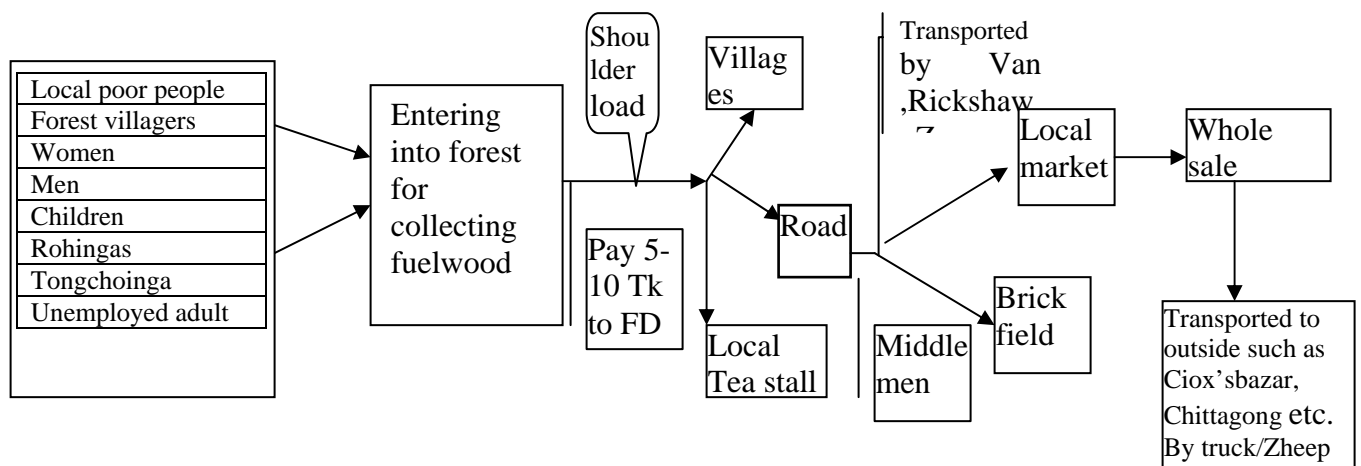
Fig. 20. Resource extraction zones within the Teknaf GR

#### 4.5.1. Details on Extraction of Some Major Resources

##### 4.5.1.1 Fuelwood collection

All fuel wood requirements of inside HHs and at least partial demand of HHs in adjacent villages are met from the forest. Besides, fuel wood collection provides primary and secondary occupation for many HHS. The Tongchoinga Tribal community is fully dependent on fuel wood selling for their livelihood. A huge quantity of fuelwood is used in local brickfields and substantial quantity of it is also transported to other areas.

This is a major and very visible activity in the GR. It is a year round activity, but major extraction occurs during the dry seasons. Fuelwood is collected both for household consumption and commercial purposes.



**Fig. 21. Flow of extracted fuelwood from Teknaf GR**

Fig. 21 shows that most of the collectors are children, adult and adolescents, both male and female, Tongchoinga and Rohingya, Most collectors are poor and supplement their income by selling fuelwood. As per local estimation by local people that about 60% of fuel wood is extracted for commercial purpose and another 40% for domestic uses.

Each male can carry or collect 2 tara (one shoulder load mean 20 to 30 Kg), whereas female can collect 1 tara per day. The prices vary based on the quality and size of fuelwood. In most cases, collectors enter into forest individually, however, sometimes, they also go by groups, particularly when forest is set on fire for clearing land for plantation or jhum cultivation. Fuelwood is collected mainly during day time. Almost all collectors are local inhabitants from inside and adjacent villages. Table 30 shows the names of most involved villages in fuelwood collection.

**Table 30. Beat wise list of settlement having large involvement in fuelwood collection from Teknaf GR**

| <b>Beat</b>        | <b>Name of settlements</b>  |
|--------------------|---|
| Shamlapur Beat     | Jhumpara, Rohingapara, Guchchhagram   |
| Monkhali           | Chammapara  |
| Shilkhali Beat     | Uttar Chakmapara, Dakhin Chakmapara, Uttar Shilkhali, Dakhin Dailpara, Jahajpura Mathpara, Miarpara.  |
| Mathabanga Beat    | Kaschapiapara, Karachipara, Bardail, Morishbunia, Mathabanga, Hajompara,  |
| Teknaf Beat        | Keruntoli, Damdamia, Lengurbeel   |
| Mosuni Beat        | Damdamiapara, Jhadimurapara, Noyapara, Chakmapara, Noyapara Rohinga camp, Dakhin Leda, Moidho Leda, Leda Lamarpara, Rongikhali, Dakhin Alikhali, Moidho Alikhali. |
| Hnilla Beat        | Pankhali, Naikhongkhali Dakhinpara,   |
| Moidho Hnilla Beat | Paschim Satghariapara, Comboniapara, Jhimong khali,   |
| Roikhong Beat      | Unchiprang, Roikhong.   |
| Whykong Beat       | Chakmapara, Lombagona, Laturikola, Amtoli, Lombabeel, Daingakata, Tonchaingapara, Secandergona, Keruntoli   |

Fuelwood is carried as shoulder or head load and taken to the nearby convenient place for selling it. The main route of access to the forest are the charas or streams, roads and forest trails (Fig.21). In an FGD, the collector alleged that they pay between Tk. 5-10 as a levy to the FD local staff for entering the forest for collecting fuelwood. Access to the forest for collecting fuelwood is not restricted, if the levy is paid. However, this was strongly denied by the FD local staff at Teknaf GR.

The collectors are allowed to collect dead branches of trees. However, in practice, sometimes, they cut some young trees, and bundle them. Sometimes they leave the cut trees to dry it for getting a dead appearance so that it could be collected as fuelwood. The collectors also cut the young valued timber trees and small bushy trees and thus poses threat to forest regeneration.

It was revealed from FGD that a large number of women are engaged in fuelwood collection especially in tribal community. As per local people about one-third of fuelwood collectors are women. The female collectors usually sell almost almost one-third of their collected fuelwood for income whereas two-thirds are used for their household consumption.



Besides the local household use, local tea stalls/ restaurants use this fuelwood for burning in their kitchen, almost all of the local brickfields use a huge quantity of fuelwood for burning in their kilns. Other local people buy fuelwood from the local market sold by collectors.

The fuelwood for commercial purposes is locally transported by van, zheep or as shoulder load to the markets where it is sold to fuelwood traders (middleman) or to the local consumers; the middleman then carry it to the wholesale markets from where it goes to Cox'sbazar, Chittagong etc by truck and zheep. A number fuelwood traders are seen in each local markets. Sometimes, the fuelwood merchant or brickfield owners engage day labor for collecting fuelwood.

#### 4.5.1.2. Timber extraction

Legal tree felling is prohibited in the GR. However, widespread tree felling, both legal and illegal, in the past contributed to the qualitative and quantitative reduction in forest and its resources and led to transformation of the evergreen to a svanah type forest. Still illegal tree felling is going on and remains as a major threat to the forest degradation. However, unavailability of suitable trees has led to the reduction in the activity. Some armed gangs, particularly from Hnilla, Hoaikhong and also from Teknaf areas involved in tree felling. Some trees are also collected as building materials and materials for fishing boat making. Sea beach and Dhaka-Teknaf road, and also sea via some cannel (ie Monkhali khal) are used as main route for tree poaching.

Many people from inside and surrounding villages of GR are directly involved with the illegal extraction of timber from the forest. Table 31 shows Beat wise distribution of most involved settlements involved with illegal tree felling.

**Table.31. Beat wise list of settlements having large involvement in tree felling in Teknaf GR**

| <b>Beat</b>        | <b>Settlements involved in tree felling</b>   |
|--------------------|---|
| Shamlapur Beat     | Jhumpara, Montoliapara, Puranpara, Notunpara.                                       |
| Shilkhali Beat     | Jahajpura Mathpara, Miarpura.Holbunia,Kaderpara, Chakmapara                         |
| Mathabanga Beat    | Kaschopiapara, Morishbunia, Mathabanga, Hajompara,                                  |
| Rajar chara Beat   | Habibchara, Mithapanirchara, Dargachara   |
| Teknaf Beat        | Naithongpara, lengurbill, Boroitoli, keruntoli                                      |
| Mochuni Beat       | Rongikhali, Puchingapara, zadimurapara, leda, Nayapara                              |
| Hnilla Beat        | Pankhali, Naikhongkhali Dakhinpara,   |
| Moidho Hnilla Beat | Paschim Satghariapara, Comboniapara, Jhimong khali, Kharengkhali, Mina bazar,       |
| Roikhong Beat      | Unchiprang, Roikhong.   |
| Monkhali           | Chammapara  |
| Whykong Beat       | Lombagona, Laturikola, Amtoli, Lombabeel, Daingakata, Tonchaingapara, Secandergona, |

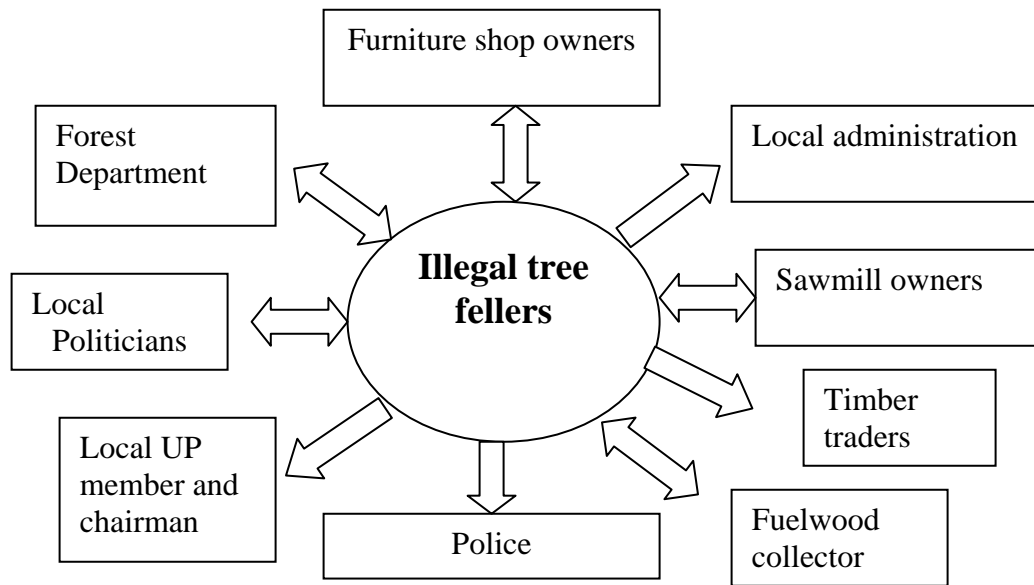
Besides the most involved settlements, people from other settlements are also involved with this activity, but to a lesser extent. In addition, some Rohingya refugees are also involved in tree poaching, mainly they are employed poacher.

The villagers who are involved with illegal felling at individual level mainly carry out the activity for supporting their livelihoods. As per local people, this activity provides cash income of taka 200-300 per day, although the activity carries high risks. However, the gangs do it for added income. The felled trees are carried through different routes (stream and trails) within the GR on shoulder or head and collect to some pre-fixed point from where the syndicate people/gang collect the timber.

The Fig. 21 shows that the illegal fellers have linkage with several groups of people such as police, administration, and local political leaders, FD etc. Both the legal and illegal timber is sold in the local market such as Teknaf, Hnillabazar, Shamlapurbar, Noyabazar, mMulovibazar etc. to the timber traders. Sometimes, they are sawn at local sawmills. Then it is transported to the various place of the country such as Cox'sbazar, Chittagong or even to, Dhaka etc by zheep, truck and bus.

Different groups such as police, BDR and FD check illegally felled trees at different level. If the illegal feller has no negotiation then FD gives notice to the illegal felling, during transporting the illegal felled timber FD, police and BDR give obstacle. FD checks the

transport in their check post. The local community people express in FGD that the check post has a link with the illegal tree feller or timber traders. Police play negative role in this aspect where as BDR roles is positive.



**Fig. 22. Linkages of various stakeholders with illegal fellers**

The felled trees mainly include the medium sized valued timber trees, mainly garjan, dhapijam, chapalish, segun, etc.

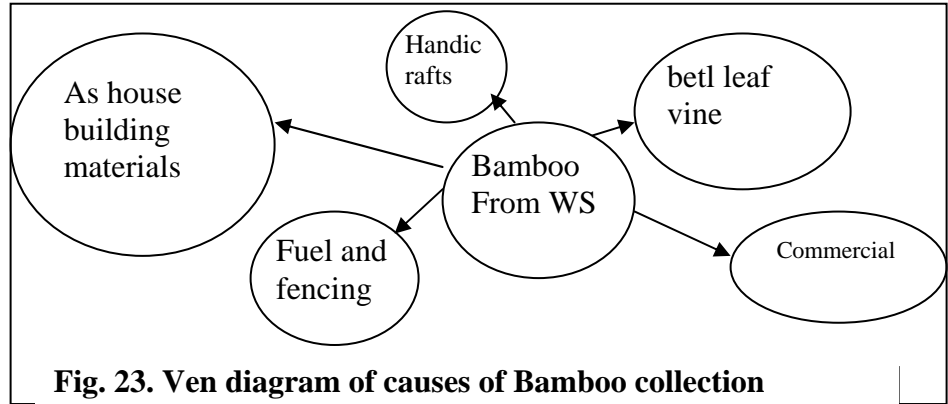
This activity is mostly carried out at night and intensively during the rainy season when access to the forest is very difficult and forest patrol is restricted. But, in some cases, the influential tree feller fell trees also in dry seasons, even at daytime. Sometimes, they come across the forest patrol. If the activity is not negotiated earlier with the local FD, they would come under fire. Sometimes, there could be exchanges of fire between the forest patrol party and armed gang of feller. Illegal tree felling can become a vicious circle once forest cases are filed against fellers. Because of the high income gained through tree felling, people often return to the forests to raise the necessary money to fight their forest case. Thus, forest cases may lead to further destruction of the forest.

Timber merchant, local political and influential persons are indirectly involved in tree felling, they usually engage Rohingya and other very poor villager in tree felling on a daily basis. Many local HHs also collect small trees as building material as their house building material. As reported by local people, in some places, Headman and forest villagers are involved in tree felling.

#### 4.5.1.3. Bamboo extraction

Like timber, widespread collection of wild bamboo from the GR led to a huge reduction in the bamboo stock. Bamboo grows as "undergrowth" and most important use of bamboo is as raw material for house construction and also used in many cottage industries in the surrounding area. Presently, it is used in betel leaf cultivation yards. Bamboo is also lost from the forest in the process of plantations by FD. The resource is now very less available

compared to pre-liberation period and trend indicates that the resource will exhaust soon. The natural regeneration of



**Fig. 23. Ven diagram of causes of Bamboo collection**

bamboo has become very limited and posing a great threat to its future availability. In spite of its depletion, every efforts are put to find and collect. Fig. 22 shows the underlying causes for bamboo collection and their relative influences.

The process of the extraction of bamboo is same as timber extraction from the GR. The forest villagers, local people and betel leaf cultivator collect bamboo illegally. Some people are traditionally habituated with collection of bamboo from the forest.

Mooli bamboo is extensively collected both for household consumption and for sale. Usually the illegally collected bamboo is sent to local market. The bamboo collectors are dependent partially on this activity for their livelihood. The villagers use vans or carts to carry those bamboos to the market; occasionally they carry as shoulder load. The local bamboo traders transport bamboo to various places, likes Cox'sbazar, Chokoria etc. It was alleged by the local people that the collectors need to pay levy of Tk. 10 for collecting bamboo from the GR. However, it was not verified by the PRA team.

#### 4.5.1.4. Cane

Natural cane in the forest is rare in the GR. Over exploitation has contributed to the reduction in cane. Local people as well as outsider people extract cane for both commercial and HHs consumption. Now a day's people collect cane at a small scale as raw materials for handicrafts production and also as building materials. According to the FD, there was no natural cane in this forest but they introduced it by their plantation program. In the current year, 20 ha area has been planted with cane.

#### 4.5.1.5. Collection of building materials

Forest villagers collect their entire house-building materials from the forest. The inside HHs also obtains their entire building materials from the forest. (Table 32) In addition to inside villagers, the reserve area is widely used by the surrounding rural population, mainly of neighboring and adjacent settlements. Usually the poor adult people collect the building materials

Furniture and fixtures also made by the forest timber products. Numerous items are included in the furniture and fixture categories. In the area forest wood is the main component for making almost all rural transports of the area including cart, BOAT, RICKSHAW, carriage van, hackney carriage etc. Considering the economic life of the transport equipment to be 20 years garjan and other tall trees are main choice for making transport equipment of the local people.

**Table. 32. Information on house and other building materials collected from Teknaf GR**

| <b>Type of structures</b> | <b>Material used</b>                  |
|---------------------------|---------------------------------------|
| Birali/ ceiling           | Garjan, Jum or other tall timer trees |
| Pole/post of house        | Jum, badi tree                        |
| Roof/ shed                | Sungrass, cane leaf                   |
| Fence                     | Bamboo                                |
| Fence pole                | guitguita trees                       |
| Floor                     | Stone, wood, mud                      |
| Furnitures                | Teak, Onaru, badi, Pitraj, Mother     |

## *4.5.2. Other Resource Collections*

### 4.5.2.1. Dry leaf

Little children and some time women collect dry leaf from the GR. They collect mainly for their HH consumption as fuel. Sometimes, dry leaf sold in local market at the rate of 10Tk per sac that contributes as an extra source of income to their family. Dry leaf collection takes place in dry season. The extreme poor people, particularly the old women and children collect it.

### 4.5.2.2. Green leaf

People also collect several green leaves of several plant species, such as Achailla leaf for transporting fish. Achailla is mainly collected by fisherman, a large scale in the west side. Local people also collect Betpata for giving shed of HHs. people also collect various green leaves for packaging various goods.

### 4.5.2.3 Lota or Vines

Local people collect various climbers mainly as a substitution for binding materials

### 4.5.2.4. Sun grass

Abundance of sungrass has increased in the recent years, particularly with the denudation of hills. Sungrass are collected as building materials by poor local people, both for HH consumption and commercial purposes. This is collected in dry season, particularly in the month of May. Sungrass collection is now a source of income for many poor HHs. Presently, many people are interested in sungrass collection. One FGD with the local community showed that people of mathabhanga beat favour creation of sungrass bed than plantations.

### 4.5.2.5. Fish & Fish culture

There are streams (locally called Ziri/Goda/Kona) inside the forest. Local people collect fish from the ziri/canal these water bodies. Some people also culture fish in those this ziri/canal. Sometimes local people make cross dam across the streams and create water reservoir for dry season and culture in those impoundments.

### 4.5.2.6. Sand and stone

Teknaf GR was subjected to intensive commercial harvesting of sand and stones during dry season. There are two syndicates involved with collection of stone and sands from the

Ziri/canal (Hoiakong & Hnilla) situated inside the forest. These two syndicates are too much influential and powerful in the locality. In spite of the ban on sand and stone collection from the GR, still these are illegally collected during dry season for road/household construction on a commercial basis by the syndicates. This practice requires entering the trucks into the GR for transporting sands and stones and thus causing disturbances to wildlife.

#### 4.5.2.7. Fruits and vegetables

Fruits and vegetables are collected and consumed by inhabitants of the inside and very adjacent village people, mainly for HH consumption. The main forest fruits that are collected by local people such as lata mangos, litchi, Chapalish Kanthat, Dauwa, Bakumgola, Chalta, amloki, hartoki, bohera, banana, chapalish kanthat etc. The fruit collectors mainly collect the fruits for their own consumption. A few of them sell these to their neighbours or to markets for additional income. Fruits are predominantly collected by local poor people and forest villagers, especially by women and children. The vegetables collected include bamboo shoots, aurum, dekhishak, haichha shak, tarashak, maminnashak, terishak etc., mainly during rainy and winter season. These are also collected mainly for domestic consumption.

#### 4.5.2.8. Hunting and killing of wildlife

Widespread hunting existed in the past. Presently, this activity is very limited. However, hunting of wildlife is still takes place on a very limited scale. In particular, birds, jungle fowl, mothura, turtles, wild boar etc. are hunted. The Tongchoinga and Rakhain ethnic community people hunt some wildlife including wild boar, monitor lizard, mongoose, and some species of snakes for their own consumption.

Local people usually kill wild animals, including snakes, foxes, pangolin, etc. when they re encountered by them. There is a serious lack of awareness about the conservation importance of the wildlife or biodiversity.

#### 4.5.2.9. Extraction of other resources

Local people also collect some other resources such as tree barks, fodder, grasses, dry and green leaves of some trees etc, at a small scale. Medicinal plants are also collected from the forest, but again at very small scale. These have very negligible impact on the forest and its biodiversity.

#### 4.5.3 Local bazaar: Place of trading the forest resources

During PRA, information on important markets/bazaars for trading forest produce located within and around the WS was collected. Table 33 provides a list of these markets along with some other relevant information.

**Table. 33. List of bazaar (markets) withing and around the Teknaf GR**

| Name of Bazar       | Location      | Beat                  | Level of forest resources trading | Remaks  |
|---------------------|---------------|-----------------------|-----------------------------------|---|
| Teknaf Bazar        | Teknaf        | Teknaf                | 00000                             | Major market for Wholesale for fuelwood, timber and other forest products |
| Ledha Bazar         | Ledha         | Mosuni                | 000                               |   |
| Kalur Dokan         | Mosuni        | Mosuni                | 0                                 |   |
| Gum gachhtola Bazar | Mosuni        | Mosuni                | 00                                |   |
| Whykong Bazar       | Whykong       | Whykong               | 0000                              |   |
| Unchiprang Bazar    | Roikhong      | Roikhong              | 000                               |   |
| Khanjorpara Bazar   | Moidho Hnilla | Moidho Hnilla         | 00                                |   |
| Noyapara Bazar      | Moidho Hnilla | Moidho Hnilla         | 000                               |   |
| Mina Bazar          | Moidho Hnilla | Moidho Hnilla         | 0000                              |   |
| Noya Bazar          | Moidho Hnilla | Moidho Hnilla         | 00                                |   |
| Khareng Khali Bazar | Moidho Hnilla | Moidho Hnilla         | 0000                              | Important for timber trading  |
| Rongikhali Bazar    | Hnilla        | Hnilla                | 000                               |   |
| Moulovi Bazar Bazar | Hnilla        | Hnilla                | 0000                              | Important place for fuelwood selling                                      |
| Hnilla Bazar        | Hnilla        | Hnilla                | 00000                             | Important market for timber trading                                       |
| Bangla Bazar        | Mathabanga    | Mathabanga            | 000                               |   |
| Morishbunia Bazar   | Mathabanga    | Mathabanga            | 0                                 |   |
| Noya Bazar          | Shilkhali     | Shilkhali             | 000                               |   |
| Jahajpura Bazar     | Shilkhali     | Shilkhali             | 00                                |   |
| Shamlapur Bazar     | Shamlapur     | Shamlapur             | 00000                             |   |
| Rohingapara Bazar   | Shamlapur     | Shamlapur             | 00                                |   |
| Palong Khali        | palong Khali  | Keruntoli petrol camp | 000                               |   |

#### 4.5.4 Seasonal changes in resource extraction

Table 34 shows the trend in forest resource exploitation by month. The exploitation of resources from the forest is season dependent. Most of the timbers are illegally felled during the rainy season, as forest patrol is poor during that period. However, house building



material collection takes during the dry season. Fuelwood is mainly collected during dry season due to easy accessibility and mobility inside the forest during that time. Bamboos extraction mainly takes place in drier months that corresponds to local needs for house building. Medicinal plants, vegetables and some other forest resources are extracted to some extent mainly during rainy season. A little amount of honey is also extracted during summer (Baishakh-Jaistha). The Tongchoinga and Rakain tribes hunt wild boar and other animals. Animals that stray into their cropfields are killed for meat. Wild boar is mainly hunted during the paddy harvesting period. Local bird hunter hunt birds by applying indigenous methods during the winter at a small scale.

**Table.34. Seasonal calendar for resources exploitation in Teknaf GR**

| Name of Resources       | Bai  | Jai  | Ash   | Sra   | Bha   | Asw  | Kat  | Agr   | Pau   | Mag    | Fal   | Cho   |
|-------------------------|------|------|-------|-------|-------|------|------|-------|-------|--------|-------|-------|
| Timber                  | 0000 | 000  | 00000 | 0000  | 00000 | 0000 | 000  | 00    | 000   | 00000  | 000   | 0000  |
| Fuel Wood               | 0000 | 0000 | 00    | 0     | 0     | 00   | 000  | 00000 | 00000 | 00000  | 00000 | 00000 |
| Vegetables              | 00   | 0000 | 00000 | 00000 | 00000 | 00   | 00   | 00    | 00    | 00     | 00    | 00    |
| Bamboo                  | 00   | 00   | 00    | 00    | 00    | 0000 | 0000 | 00000 | 0000  | 00000  | 00000 | 00000 |
| House Building material | 0    | 0    | 0     | 0     | 0     | 000  | 000  | 0000  | 00000 | 000000 | 00000 | 00000 |
| Medicinal Plants        | 0    | 00   | 00    | 00    | 0     | 0    | 0    | 0     | 0     | 00     | 00    | 00    |
| Wildlife hunting        | 0    | 0    | -     | -     | -     | -    | -    | 0000  | 0     | 0      | 0     | 0     |
| Honey                   | 00   | 0    | -     | -     | -     | -    | -    | -     | -     | -      | -     | 0     |
| Sand extraction         | 0000 | 0    | 00    | 00    | 000   | 0    | 0    | 00    | 000   | 00000  | 0000  | 0000  |
| Stone extraction        | 00   | 0    |       |       |       |      |      |       | 000   | 000    | 000   | 00    |

Note: Bai=Baisak (April 15-May 14), Jai= Jaistha (May 15-June 15), Ash=Ashar (June 15-July 14), Sra=Sraban

(July 15-Aug 14), Bha=Bhadra(Aug 15-Sept14), Asw=Ashwin (Sept 15-October14), Kar=Kartik(Oct 15-Nov14),

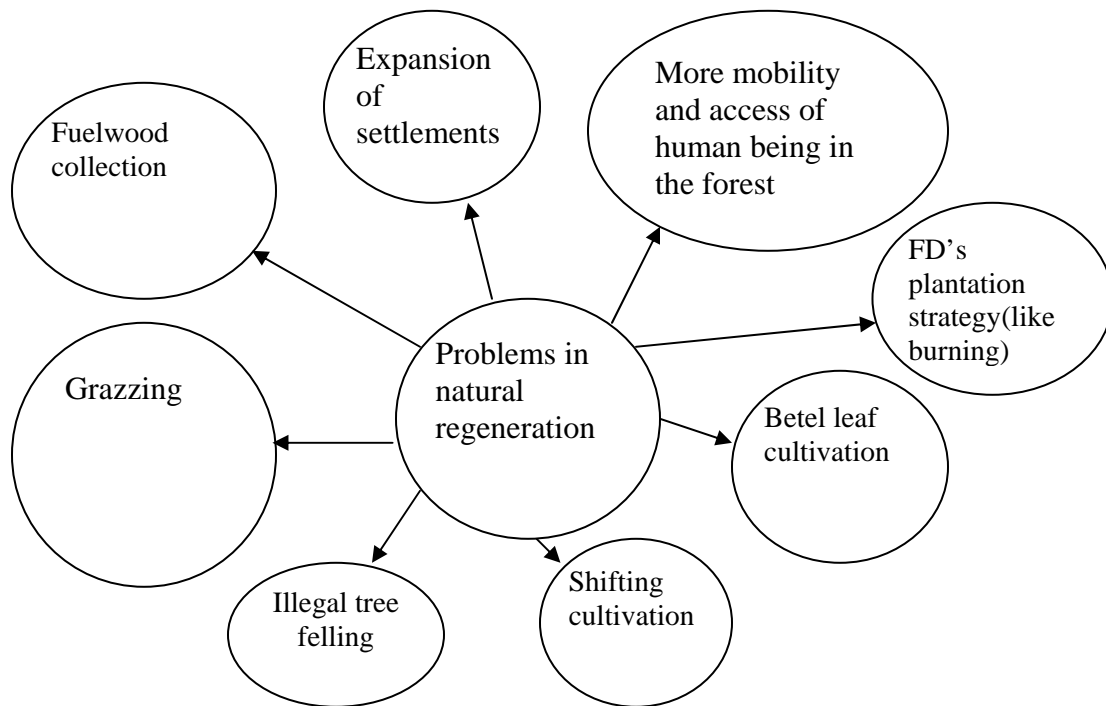
Agr=Agrahayan (Nov 14-Dec15), Pau=Paush(Dec14-Jan15), Mag=Magh(Jan 15-Feb14), Fal=Falgun (Feb15-Mar 14),

Cho=Choitra(Mar14-Apr15)

## 4.6 Resource Regeneration Practices

### 4.6.1 Natural regeneration

Natural regeneration in the Teknaf Game Reserve is poor, particularly true for trees. Therefore, this remains as an important issue from the perspective of biodiversity and sustenance of the forest itself. There are many reasons for this poor regeneration. Fig 24 shows the major causes for poor reeneration phenomenon in the forest. However, regeration of of some herbs and shrubs, sungrass have increased with the denudation of the hills. This also poses a threat to the forest biodiversity.



**Fig. 24 Venn diagram: problems with natural regeneration**

#### 4.6.2 Plantation by FD and associated problems

The plantation policy for the GR forest appears to be concentrated on the production of timber, cane, bamboo and some other forest products, with planning, establishment, and management under the centralized control of the Forest Department. FD records show that plantation of Teknaf GR started in 1925. Official data has collected on plantation of last 15 years. From the period of 1989-90 to 2000-2001 about 2959.08 ha (Table 35) area have been planted. Jau has also been planted along the seas beach as a measure for protection from cyclones.

**Table. 35 Information on plantation in Teknaf GR from 1989-2001**

| Year of Plantation  | Range     | Beat             | Plantation Area (Ha) |      |      |          |       | Remarks |
|---|-----------|------------------|----------------------|------|------|----------|-------|---------|
|   |           |                  | SR                   | LR   | Teak | Fuelwood | Total |         |
|   |           | Beat             |                      |      |      |          |       |         |
| Plantation under Forest resources management project (FRMP) |           |                  |                      |      |      |          |       |         |
| 2000-01   | Teknaf    | Teknaf           | 55.00                | 25.0 |      |          | 80.0  |         |
|   |           | Mouchuni         | 20.0                 | 00.0 |      |          | 20.0  |         |
|   |           | Hnilla           | 40.0                 | 00.0 |      |          | 40.0  |         |
|   |           | Moddah<br>Hnilla | 00.0                 | 20.0 |      |          | 20.0  |         |
|   | Shilkhali | Shilkhali        | 00.0                 | 20.0 |      |          | 20.0  |         |
|   | Whykong   | Roikhong         | 85.0                 | 00.0 |      |          | 85.0  |         |

|           |           |                  |      |       |      |  |       |   |
|-----------|-----------|------------------|------|-------|------|--|-------|---|
|           |           | Shamlapur        | 0.0  | 40.0  |      |  | 40.0  | dakhijum,<br>Telsur,<br>Garjan,<br>sagun,<br>Chickrash,<br>Mehogoni,<br>Sal |
| 1999-2000 | Teknaf    | Teknaf           | 20.0 |       |      |  | 20.0  |   |
|           |           | Mouchuni         | 30.0 |       |      |  | 30.0  |   |
|           |           | Moddah<br>Hnilla |      | 37.0  | 13.0 |  | 50.0  |   |
|           | Shilkhali | Shilkhali        |      | 6.0   | 19.0 |  | 25.0  |   |
|           | Whykong   | Shamlapur        |      | 37.0  | 13.0 |  | 50.0  |   |
| 1998-99   | Teknaf    | Teknaf           | 45.0 |       |      |  | 45.0  |   |
|           |           | Mouchuni         | 26.0 |       |      |  | 26.0  |   |
|           |           | Moddah<br>Hnilla | 00.0 |       |      |  | 68.0  |   |
|           | Shilkhali | Shilkhali        | 00.0 |       |      |  | 86.0  |   |
|           | Whykong   | Shamlapur        | 00.0 |       |      |  | 50.0  |   |
| 1997-98   | Teknaf    | Mouchuni         | 20.0 |       |      |  | 20.0  |   |
|           |           | Hnilla           | 00.0 | 22.0  | 8.0  |  | 30.0  |   |
|           |           | Moddah<br>Hnilla | 00.0 | 38.0  | 12.0 |  | 50.0  |   |
|           | Shilkhali | Shilkhali        | 00.0 | 15.0  | 5.0  |  | 20.0  |   |
|           | Whykong   | Shamlapur        | 00.0 | 37.0  | 13.0 |  | 50.0  |   |
| 1996-97   | Teknaf    | Teknaf           | 18.0 |       |      |  | 18.0  |   |
|           |           | Mouchuni         |      | 22.0  | 8.0  |  | 30.0  |   |
|           |           | Hnilla           |      | 15.0  | 5.0  |  | 20.0  |   |
|           |           | Moddah<br>Hnilla |      | 30.0  | 10.0 |  | 40.0  |   |
|           | Shilkhali | Mathabhanga      |      | 15.0  | 6.0  |  | 21.0  |   |
|           | Whykong   | Shamlapur        |      | 44.0  | 14.0 |  | 58.0  |   |
| 1995-96   | Teknaf    | Teknaf           | 30.0 | 00.0  | 00.0 |  | 30.0  |   |
|           |           | Mouchuni         | 18.0 | 45.0  | 15.0 |  | 78.0  |   |
|           |           | Hnilla           | 00.0 | 45.0  | 15.0 |  | 60.0  |   |
|           |           | Moddah<br>Hnilla | 00.0 | 39.0  | 13.0 |  | 52.0  |   |
| 1994-95   | Teknaf    | Teknaf           | 20.0 | 19.0  | 6.0  |  | 45.0  |   |
|           |           | Mouchuni         | 20.0 | 58.0  | 19.0 |  | 97.0  |   |
|           |           | Hnilla           | 00.0 | 30.0  | 10.0 |  | 40.0  |   |
|           |           | Moddah<br>Hnilla | 00.0 | 30.0  | 10.0 |  | 40.0  |   |
| 1993-94   | Teknaf    | Teknaf           | 21.0 | 00.0  | 00.0 |  | 21.0  |   |
|           |           | Mouchuni         | 40.0 | 37.08 | 13.0 |  | 90.08 |   |
|           |           | Hnilla           | 00.0 | 19.0  | 6.0  |  | 25.0  |   |
|           |           | Moddah<br>Hnilla | 00.0 | 45.0  | 15.0 |  | 60.0  |   |

|                                      |           |                  |        |       |      |      |       |  |
|--------------------------------------|-----------|------------------|--------|-------|------|------|-------|--|
|                                      | Shilkhali | Rajarchara       |        | 16.0  | 6.0  |      | 22.0  |  |
|                                      | Whykong   | Roikhong         |        | 15.0  | 5.0  |      | 20.0  |  |
|                                      |           | Shamlapur        |        | 32.0  | 10.0 |      | 42.0  |  |
| 1992-93                              | Teknaf    | Teknaf           |        | 16.19 | 3.81 |      | 20.0  |  |
|                                      |           | Moddah<br>Hnilla |        | 37.0  | 3.0  |      | 40.0  |  |
|                                      | Shilkhali | Shilkhali        |        | 18.0  | 2.0  |      | 20.0  |  |
|                                      |           | Mathabhanga      |        | 18.0  | 2.0  |      | 20.0  |  |
|                                      |           | Rajarchara       |        | 20.0  | 00.0 |      | 20.0  |  |
| <b>2<sup>nd</sup> Forest project</b> |           |                  |        |       |      |      |       |  |
| 1991-92                              | Teknaf    | Teknaf           | 00.0   | 50.0  |      |      | 50.0  |  |
|                                      |           | Mouchuni         | 00.0   | 00.0  |      | 75.0 | 75.0  |  |
|                                      |           | Hnilla           | 50.0   | 00.0  | 00.0 | 00.0 | 50.0  |  |
|                                      |           | Moddah<br>Hnilla | 60.0   | 00.0  | 00.0 |      | 60.0  |  |
|                                      | Shilkhali | Rajarchara       | 00.0   | 50.0  | 00.0 |      | 50.0  |  |
|                                      | Whykong   | Roikhong         | 100.0  | 00.0  | 00.0 |      | 100.0 |  |
|                                      |           | Shamlapur        | 00.0   | 25.0  | 00.0 |      | 25.0  |  |
| 1990-91                              | Teknaf    | Teknaf           | 50.0   |       |      |      | 50.0  |  |
|                                      |           | Mouchuni         | 0      | 0     | 75.0 |      | 75.0  |  |
|                                      |           | Moddah<br>Hnilla | 50.0   | 00.0  | 00.0 | 00.0 | 50.0  |  |
|                                      | Whykong   | Roikhong         | 100.0  | 00.0  | 00.0 |      | 100.0 |  |
| 1989-90                              | Teknaf    | Teknaf           | 50.00  | 00.0  | 00.0 |      | 50.0  |  |
|                                      |           | Hnilla           | 30.0   | 00.0  | 00.0 |      | 30.0  |  |
|                                      |           | Moddah<br>Hnilla | 120.00 | 00.0  | 00.0 |      | 120.0 |  |
|                                      | Whykong   | Roikhong         | 120.0  | 00.0  | 00.0 |      | 120.0 |  |

Some special plantation program also have also been done in some beats such as:

**Shamlapur beat: (Special plantation)**

- 2001 22Ha- cane, 40 ha-LR
- 2002 10 ha- Jhau
- 2003 40 ha jhau
- 2004 18 ha coconut

**Shilkhali beat**

- 2001-20ha LR- mehgoni, teak, gammer
- 2002- Nil
- 2003- Nil
- 2004- FSP buffer zone plantation-50Ha, SR (85%)  
with Akashmoni, mengium, akasia, LR (10%) and  
Medicinal (5%)

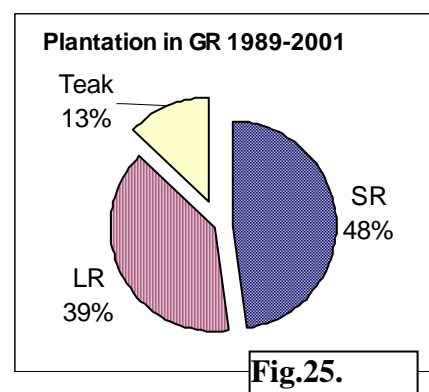


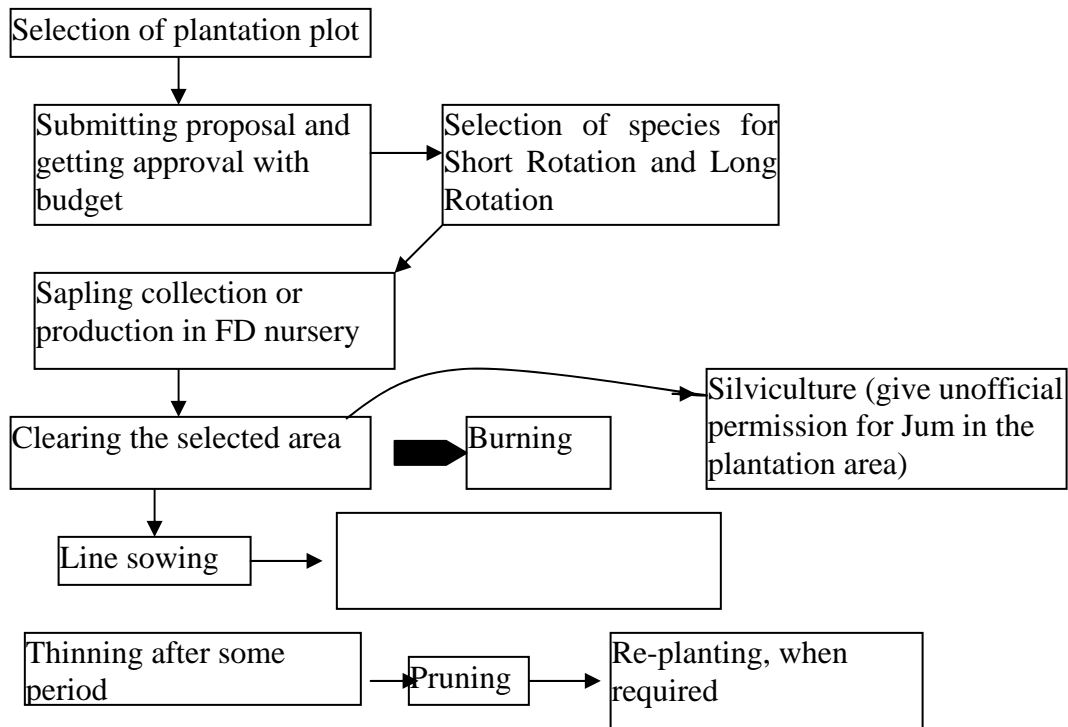
Fig. 25 shows of the tarea under different plantations inside the GR in the period from from 1989 to 2001. As shown, manjor plantations have been done with exotic short rotational trees, long rotational and teak plantations.

#### *4.6.3 Plantation process and practice*

FD records shows that about 28 species of trees were used in planting the forest. Intensive plantation of the forest occurred during the period 1991-2004. The later plantations include mainly short-rotation monoculture plantations mostly with exotic, rapid growing species. The commonest species for the short-rotation plantation are akasia, mangium, hybrid, eucalyptus (not it is benned for plantaion) and akashmoni. The FD has also planted cane, mutra and bamboo in a substantial area under the cane, mutra and bamboo plantation project of Cox'sbazar Forest Division. Initial plantations included only long-rotation plantation, primarily with garjan, chpalish, teak and others conspicuous tree species.

As revealed from FGD with local FD staff that the FD's plantation strategy for GR is still guided by the production forestry and there is no evidence that plantation strategies and practices have changed after the declaration of the game reserve.

Fig 26 shows a flowchart for the plantation in the GR. The degraddaed forest area is burnt and cleared. Plant with short or long rotational plant. Regular weeding of the planted area, thinning and eweeding in subsequent years. In fact, they remove all vegetaion from the area and thus pose a threat to the forest biodiversity. The FD also continues to cut under story vegetation in the natural forest in order to raise plantation. Although not quantified, this practice has a significant negative impact on regeneration and forest succession. Changing these practices may be difficult for plantation.



**Fig. 26. Flow chart of FD's plantation process in GR**

#### 4.6.4 Shifting Cultivation (Jhum Chash)

Shifting cultivation or Jhum chash is a traditional crop production process practiced by the ethnic community, mainly by the Tongochya. It is mainly done on hilly slopes. In the process they temporarily encroach forest land, burn and clear it and then seeds of different crops are sown. Now a dias some Bengali settlers also undertake this practice. Although government laws prohibit this kind of cultivation in the forest hills but still a significant number of people are involved in shifting cultivation. This practice poses a great threat to the forest bio-diversity. In some places of GR, especially in Hnilla and Whykong, JUM is almost certain to be blamed for deforestation and soil degradation. It is carried out predominately on the steep slopes of the high hills. A Jum cultivating family or community (Jumia) selects a convenient piece of land in the month of January and February. Then the Jumias cut all the trees, vegetation, and left to dry and then they set fire to it. The ground is then cleared of charred logs and debris. Now the jumias await or rains. As soon as rain falls and saturates the ground, sowing commence. They mix seeds of different crops and plant them in small holes at fairly even intervals. Several crops along with some indigenous rice

species (i.e Kaon rich), various vegetables and some fiber plants are cultivated. A jum plot can be cultivated only two/three years in a row and then the land takes approximately 10 years or more to recover. It is reported thaty FD gives permission unoffically for Jum cultivation inside the plantation area. The local FD staff and also the community express that jum is not farmful for the forest. As per statement of a FD staff said “the jum cultivator help us for clearing the forest for plasntation, and also help us in protecting the plantation because they regularly work on their jhum lnad. They also use fertilizer, which also helpe our planted trees for growing faster”.

## **4.7 Land Encroachment**

### *4.7.1 Conversion of the GR through Land Encroachment*

One of the main threats for the GR and its cover is land encroachment. Stopping the conversion of land from forestry to agriculture, settlements or scrub is probably the greatest existing challenge for the project in Teknaf GR forests. The process of encroachment started even before the Liberation War, but at present the rate is extreme. While the Forest Department acknowledge the problem in the south, the information they hold is a huge underestimation of the extent of the problem (possibly up to 10 or 20 times lower than actual rates), and there is evidence that these encroachment figures are influenced by corruption by the Forest Department staff.

Six differenttypes of land encroachment could be identified in the area. These are:

1. Legal encroachment by Government
2. Elite led land grabbing and conversion to settlements, agriculture or aquaculture.
3. Settlements created by Rohingya refugees
4. Encroachment by Forest Villagers as population increases,
5. Encroachment for Betel Leaf Cultivation.
6. Land encroachment for Jum cultivation

#### **i. Legal Encroachment by Government**

Teknaf Game Reserve includes areas where the Government has taken land out of the control of the Forest Department and handed it over to the Ministry of Land for other use. Examples include land port, two UNHCR refugee camps housing 20,000 Rohingya refugees, a tourist hotel, and a BDR Company Headquarters within Teknaf. However, some of these

papers may be forged by the District Administrator for fishery development, and for brickfields within Forest Department land.

## **ii. Land Grabbing by Elites**

The process of land grabbing is organised by highly influential local elites, and at present the Forest Department are unable to act to prevent its occurrence.

### **The stages of the land grabbing process are summarised below:**

1. Land to be encroached is identified,
2. Intelligence gained about Forest Department patrolling and other activities (often from Forest Villagers),
3. Intimidation or negotiation with Forest Officers to ensure they do not interfere with the clearance,
4. Hiring an armed gang of labourers (often Forest Villagers, or Rohingas in Teknaf) to go into the forest area at night,
5. Land clearance – removal of valuable timber to be sold by the organisers (if there is any forest there!), followed by the burning of scrub,
6. Land conversion – hundreds of landless people move in, converted to betel vine cultivation or used for aquaculture

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

## **iii. Encroached by influential persons so called Zamindar (Land Lord) or Jootdar and political leader:**

The local influential and political persons are encroaching land by exerting their influences and upper-level connections. The FD is helpless in this regard. It is now a tradition their and land encroachment determines the social position of elitness. Usually they don't use the land directly.

## **iv. Encroachment around Forest Villages**



The forest villages was established by the FD long back and allocated them with about 2 acres of land. Since then, the number of Forest villagers has increased and that led to expand their settlement on forest land. Besides, each recognized forest villagers have grabbed more land than what was allocated to them. They have also expanded their agricultural crop land.

The headman of different beats also encroached a large amount of land, only by maintaining good relationship with FD staff especially with beat officer and range officer. For example, the headman of Shilkhali name Abul Kalam Abu has encroached 30 acres of land and also made few houses for giving rent, he also settled some Rohingas into his encroached land.

#### **v. Encroached by farmer**

Usually they are poor people settled down inside or adjacent to the forest. These people have encroached small areas for agriculture. Usually they have encroached plain land and cultivate various crops. Some times they also level the highland (hills) by cutting/digging soil. These kinds of encroachment are more prevalent in HNilia and Teknaf areas.

#### **vi. Present situation of land Encroachment**

Land encroachment is a serious problem and it is aggravating every day. Encroachment is noticed mostly on the flat and gentle slopes of Teknaf from the main roadsides and along the beach. Also on Whykong-Samlapur Road on the north. Encroachment has occurred on the Saplapur Beat (Table 33) and in the sample plot where there is even now a patch of big Garjan trees about 80 yrs. Old. During RRA, it was revealed from the FGD with DFO staffs at Cox'sbazar that officially a total of 794.77 acres land of GR has been encroached and Office Record of DFO, Cox's Bazar (south) shows the number of encroachers to be 2,367 persons but the DFO states that the actual number of encroachers and area of encroached land is far above this figure. These lands have variously been transformed into agricultural crop lands, homesteads, betel vine yards, etc. Some people claimed that they have legal documents in favour of their possession. The range wise official encroachment is shown in table 36.

**Table. 36. Range wise official encroachment area**

| Sl | Range        | Encroachment Area (acres) | No of encroacher HHs |
|----|--------------|---------------------------|----------------------|
|    | Whykong      | 86.50                     | 258                  |
|    | Shilkhali    | 496.96                    | 1100                 |
|    | Teknaf       | 212.08                    | 848                  |
|    | <b>Total</b> | <b>795.54</b>             | <b>2206</b>          |

It has seen that officially record of illegal encroachment is highest in silkhali and lowest in Whykong. Official only 3 % of total land area of GR has been encroached. But the actual picture is more than this list. It was revealed from PRA that about 30% land has been encroached. For example in one beat of Teknaf called Moddahnilla, from the FGD with FD's staff and local people that Listed encroacher is 173 HHs but the actual number is more than the list.

**Table. 37. Distribution of encroacher HHs in Moddahnilla beat**

| Sl | Village/settlements  | No, of encroacher HHs |
|----|----------------------|-----------------------|
| 1  | Kutubdiapara         | 66                    |
| 2  | Zimang khali         | 2                     |
| 3  | satgharia para       | 98                    |
| 4  | Un-Chi-Prang*        | 149                   |
| 5  | Kangar para          | 16                    |
| 6  | Nayapara             | 8                     |
|    | Total Enchoacher HHs | 339                   |

\* this village is fall into the two beat of two range.

## 4.8 Socio-economic Settings and Dynamics

### 4.8.1 Local Community and Power Structure and Local Governance

#### 4.8.1.1 Local decision makers and influential people

A total of 61 influential persons (including local Government and public representatives) have been identified in the locality and many of them have control over the local people, their activities and even over local administration. Some of them have linkages with the illegal tree feller. Table 38 provides the name and address of the influential persons, while Fig. 27 shows the domain of power within the locality. Besides, there are several outsiders who also have influence on the local people and their activities and are also involved with illegal harvesting of trees.

**Table. 38. List of powerful and influential persons in Teknaf GR area**

| SI                           | Name                    | Designation  | Remarks        |
|------------------------------|-------------------------|--|----------------|
| 1                            | Md. Shajahan Choudhury  | MP   | *****          |
| 2                            | Aezhar Company          | Ex-Upazilla Chairman   | ****           |
| 3                            | Mostak Ahmed            | Ex Chairman of Whykong & President of upazilla BNP           | *****          |
| 4                            | Abdur Rahman Bodi       | Chairman of Teknaf Pourashova/ S/O-Aezhar Company            | ****           |
| 5                            | Zafar Ahmed             | Chairman of Teknaf Union                                     | *****          |
| 6                            | Monir Chairman          | Ex UP Chairman Baharchara                                    | ****           |
| <b>Shmlapura</b>             |                         |  |                |
| 7                            | Abdul Huq Member        | Member, UP   |                |
| 8                            | Chou. Salam member      | Member, UP   |                |
| 9                            | Monzur master           | Respectable person   | *              |
| 10                           | Chadu member            | Member, UP   | *              |
| 11                           | Md. Saifullah           | President Bazar committee & President of Baharchara Union AL | ***            |
| 12                           | Sahidul Islam           | Member 1 No. ward  |                |
| 13                           | Hazi Azizul Islam Dhipo | Headman & tree feeling Syndicate                             | ***            |
| 14                           | OCR Rahman              | Member 2 No. ward  | *              |
| 15                           | Hossain ahmed           | Ex Member  |                |
| 16                           | Nurul hakim             | Headman, Shamlapur Beat                                      |                |
| <b>Ja17hajpura/Shilkhali</b> |                         |  |                |
| 18                           | Master Khurshid Alam    |  |                |
| 19                           | Master Abul Kasem       | Member & President of Banraksma committee                    | ***            |
| 20                           | Sha alam                | Village doctor   |                |
| 21                           | Abul Kasem              | Ex Member  | *              |
| 22                           | Arsad master            | Jamayat leader & respectable person                          | Jahazpura ***  |
| 23                           | Dr. Rafiqul Islam       | Secretary banraksma committee & President of UP BNP          |                |
| 24                           | Dr. Momotaz Uddin Ahmed | Landlord   | Kaderpara ***  |
| 25                           | Syed Hossain            | Al Leader  | Holbonia       |
| 26                           | Ersadur Rahman          | Ex Chairman  | **             |
| 27                           | Khursid Alam            | Ex Memeber & teacher Junior School                           | Holbonia       |
| 28                           | Moulana Hafez saifullah | Chairman, UP Baharchara                                      | Kaderpara **** |
| 29                           | Hazi hafez Ahmed Chou   | Landlord & s/o- Dr. Momotaz                                  | Kaderpara      |
| 30                           | Helal uddin             | Member   | Kaderpara      |
| 31                           | Hazi Abul kalam         | Headman & encroacher   | Kaderpara      |
| 32                           | Fakir Chan Sikder       | Good link with Chairman, MP                                  | Mia para **    |

| SI               | Name                    | Designation                                   | Remarks      |
|------------------|-------------------------|---|--------------|
| 33               | Hazi Sukkur Ali         | Forest Villager                               |              |
| <b>Whykheong</b> |                         |   |              |
| 35               | Mostak Ahmed Choudury   | Ex Chairman, Prsident Upazilla BNP            | *****        |
| 36               | Moulana NurAhmed Ansari | Chairman Whykong Up & Jamayat Leader          | ****         |
| 37               | Zafar Ahmed Choudury    | President, Upazilla AL Teknaf                 |              |
| 38               | Abul hasem Member       | Ex Chairman                                   | ***          |
| 39               | Anu Mia                 | Gram Sarker                                   |              |
| 40               | Sabbir Ahmed            | Headman                                       |              |
| 41               | Master Sanu Chakma      |   |              |
| 42               | Abul Baset Bacchu       | Ex Member & Jamayat Leader                    | **           |
| 43               | Sangu Sarder            |   | Amtoli       |
| 44               | Kabir Ahmed Choudury    | Member  | Amtoli *     |
| 45               | Monbil Chakma           | Encroacher a huge land                        |              |
| 46               | Afazuddin               | Headman, Roikhang                             |              |
| 47               | Zakir ahmed             | Headman, Whykong (IaturiGhona)                | *            |
| 48               | Mong Kue                | Headman, lombaGhona                           |              |
| 49               | Zatin Chakma            | Headman, hotikjola                            |              |
| 50               | Kalumia                 | Headman, karuntoli                            |              |
| <b>Hnilla</b>    |                         |   |              |
| 51               | Al Haz S K Anwar        | Chairman Hnilla UP                            | ****         |
| 52               | Sarwar Kamal            | Secretary Teknaf BNP                          | *****        |
| 53               | Mohammad Ali            | Ex MP, AL                                     | ***          |
| 54               | Md. Hasan               | Headman                                       |              |
| 55               | Master Rashid           | Villager and senior Vice president Teknaf BNP | ***          |
| 56               | Syed Ahmed              | Forest villager                               | *            |
| 57               | Alhaz Abdus Sobhan      | Local Madrasa committee secretary             |              |
| 58               | Sarder Abul Hossain     | Uncle of current chairman and village head    |              |
| 59               | Jalal Uddin             | Ex Chairman                                   |              |
| 60               | Moulana Md. ali         | Businessman                                   |              |
| 61               | Rtd. Lt. Col. Mon Que   | Tribal  | Chowdurypara |

\* asterik indicates level of power

PRA aimed at revealing the domain of their power and found that locally influential persons have linksges with nationally influential powerful political leaders, MP and Ministers. Some of the most influential persons in the locality are Minister Salauddin, MP Mohammed Sajahan, Ex MP Mohammad Ali, Chairman of Teknaf Union Parishad Mr. Jafar Member, Ex Upazilla Chairman Azhar Company and his son, Present Teknaf Pourashova Chairman Abdur Rahman Bodi, Chairman of Whykong Union Parishad Moulana Nur Ahmad, and

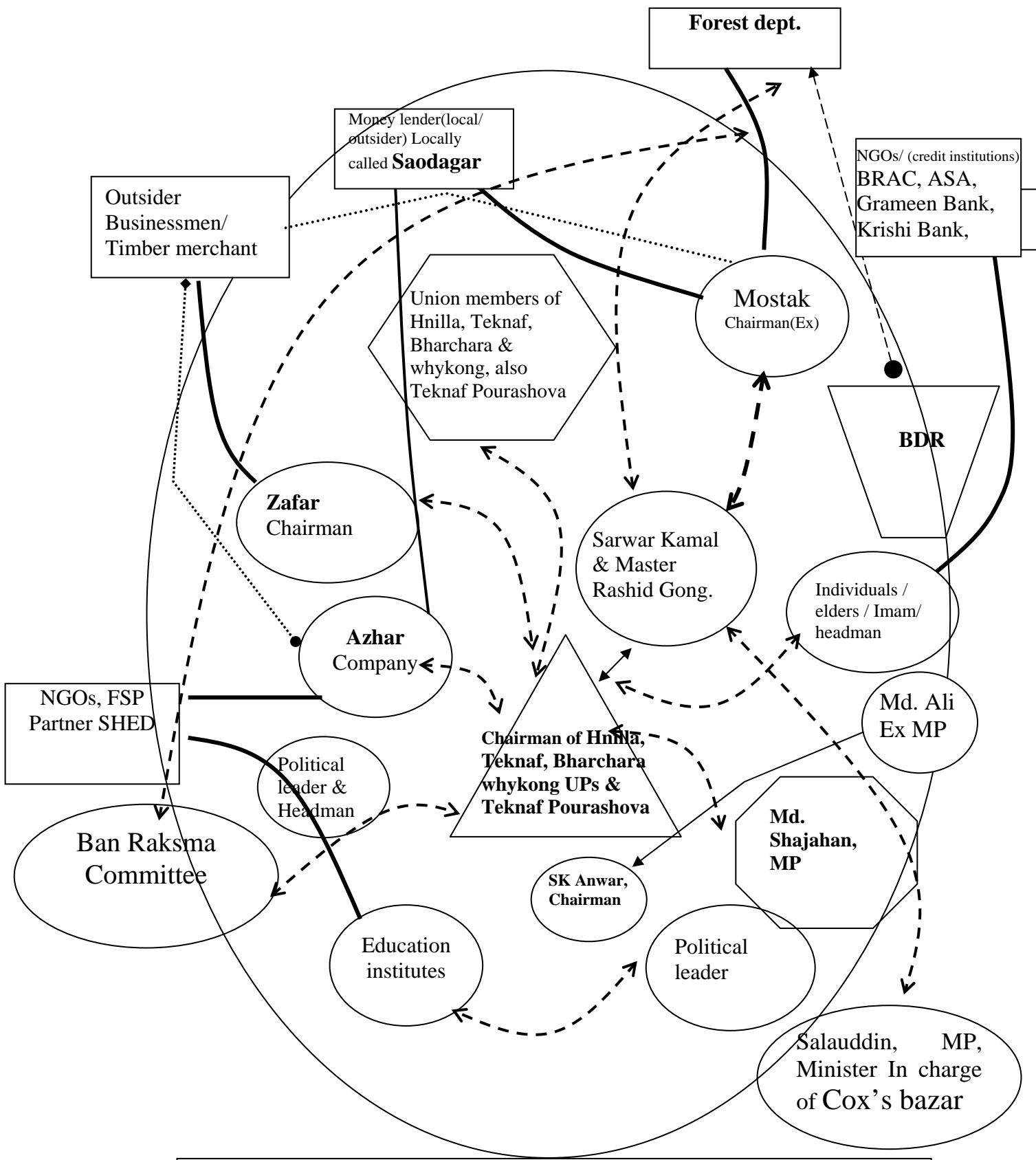
*Site-Level Field Appraisal: Teknaf Game Reserve*

Chairman of Hnilla SK Anwar. These people should be consulted while implementing the project in Teknaf GR. The socio-gram of power structure of Teknaf GR is shown Fig. 27.

#### *4.8.1.2 Local governance*

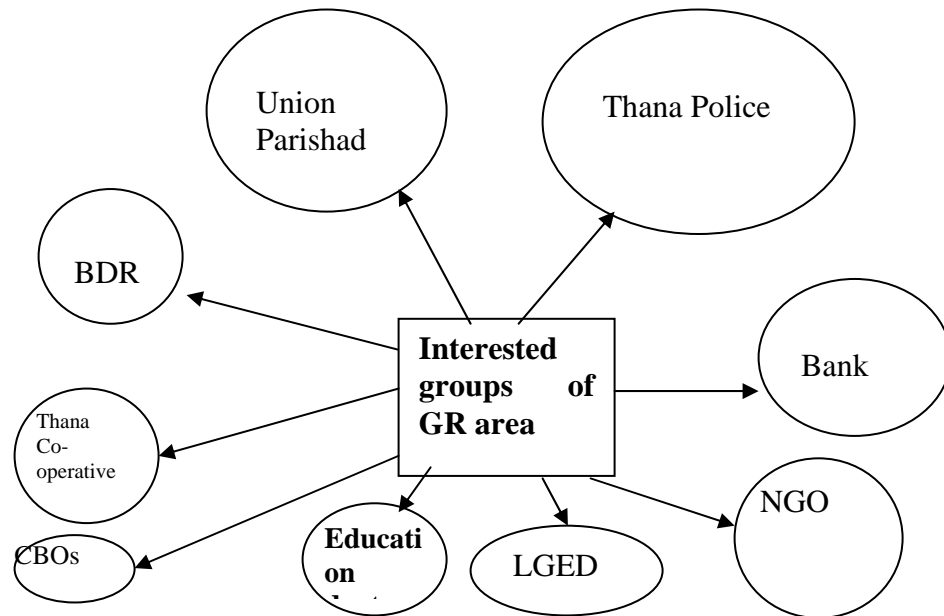
Local Union Parishad is the lower level local government entity and look after local welfare and development. It has also emerged as the main center for conflict resolution. The UP members are also head of gram sarker (village level govt. recognized entity), who are elected from different areas of the Union; look after their respective areas. The local public representatives are consulted whenever there is a local issue. There is also a new local organization, the Gram Sarker (Village Government), in each ward (village) and deal with all local issue, including welfare, development and dispute and conflict.

Police administration at Upazila level is the local law enforcing agency and are involved with maintaining local law and order situation. There are two police camp in Shamlapur bazar, besides the highway of Hnilla and Teknaf police thana act as public law enforcement institutions. They are the authority to make arrests of warranted person by forest cases. They claim that they help in forest protection.



**Fig. 27. Interlinkages of influential people indicating the domain of power**

The tribal people have their own 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 beat of the GR, for the forest villages have separate governance system. In the forest village, there is a community leader, called Headman, as recognized by the FD. Fig. 28 shows the relative involvement of different Government and Non-Government organizations in the locality for local welfare, development and administration

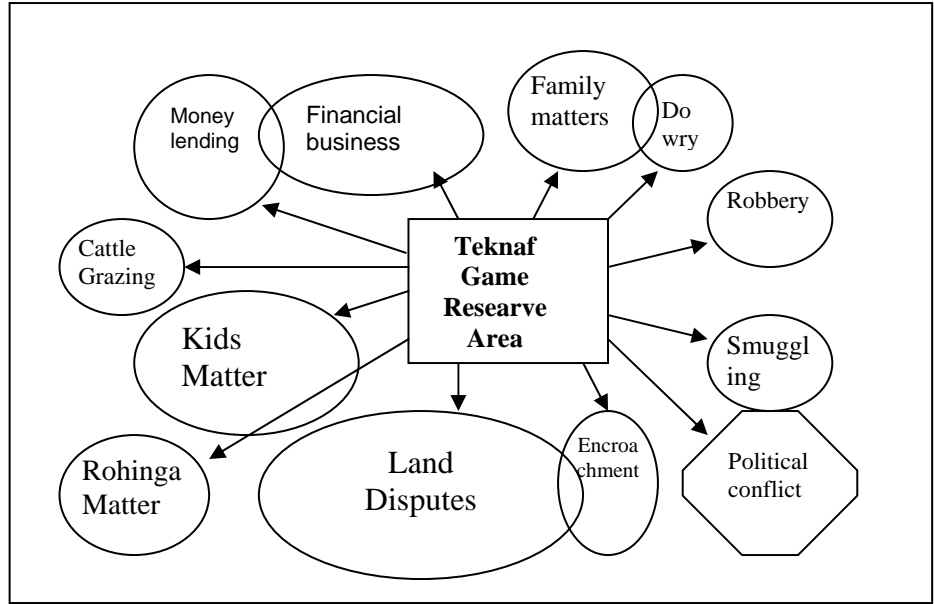


**Fig.28. The relative level of influence of different local institutions for local governance**

4.8.1.3 Local conflict, conflict resolution, social adhesion and cohesion

**i. Sources of conflict**

Fig. 29 shows the causes for conflict in the area. The main source of conflict among local people centered on land disputes, over both legal and illegally occupied and also for money lending and other financial business, dowry, family matter,

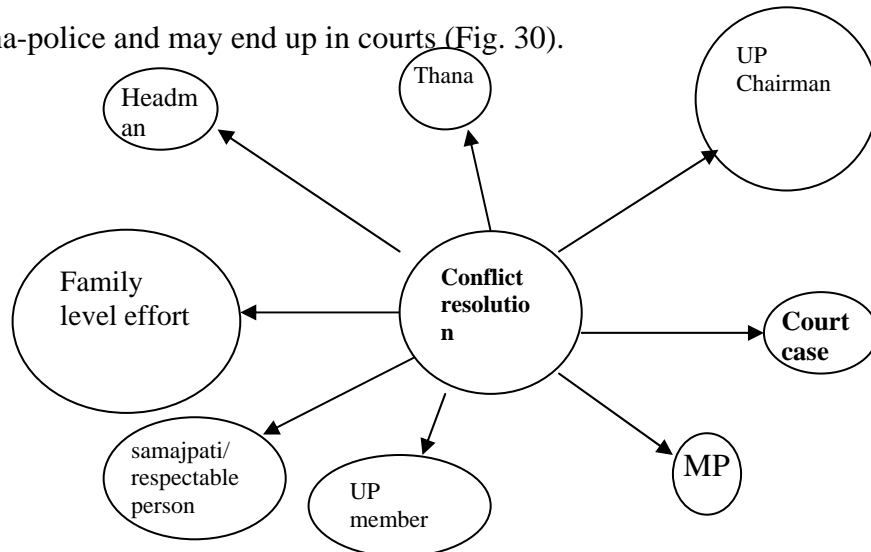


**Fig. 29. Venn Diagram: Sources of conflict**

cattle grazing, stealing, kid’s matter etc. specially in Hnilla smuggling of fertilizers to Myanmar. Among the forest villagers, in mostcases conflict arises from the issue of demarcating the boundary of encroached land. In the Rohingya community, the main sources of conflict are concentrated on family matters.

**ii. Conflict resolution**

Conflicts are resolved by arbitration by local elites & public representatives (MP, UP chairman, members), Gram Sarker. If the local efforts are not fruitful it may lead to filing cases with Thana-police and may end up in courts (Fig. 30).



**Fig. 30. Ven diagram: Resolution of conflict**



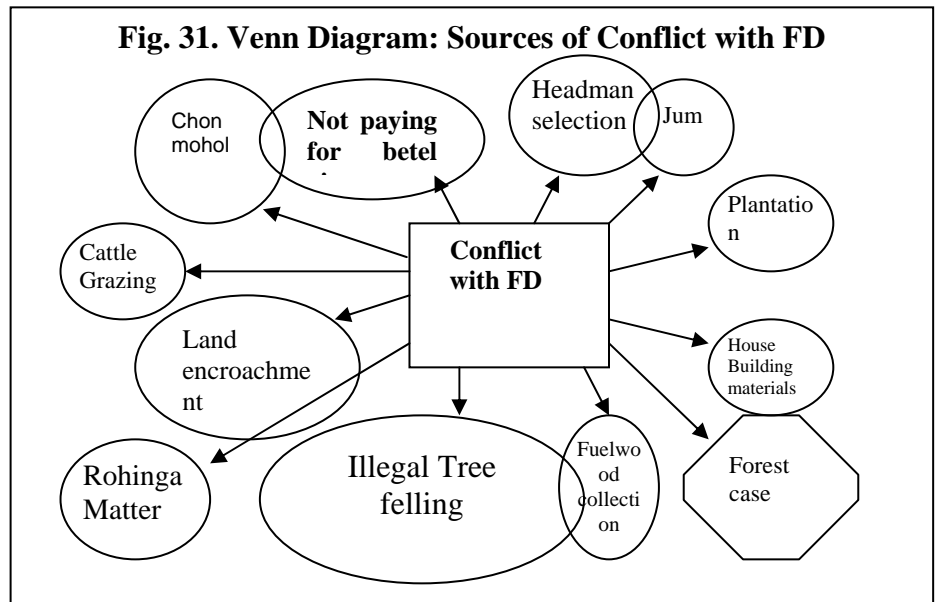
**iii. Conflict resolution mechanism:** The local level conflicts are resolved in several ways. The Table 39 shows the ways of resolving conflict in the area. If the conflicts arise due to forest land disputes then people often go to the nearby forest office. However, in the cases of family level conflicts, usually the family head and old member try to resolve the conflict. In the community level, conflict usually resolved primarily by the village head locally called *samajpoty*.

**Table. 39. Sources of conflict and its resolution**

|   | Sources of conflict                    | Resolution  |
|---|--|---|
| 1 | Land disputes                          | By arranging local <i>salis</i> through local member and chairman |
| 2 | With Partner                           | Do  |
| 3 | Vote                                   | UP  |
| 4 | Encroaching Hill                       | Local influential people make negotiation                         |
| 5 | Tree Felling                           | Forest cases  |
| 6 | Money dealings                         | <i>Salis</i>  |
| 7 | To establish influence in the locality | <i>Salis</i>  |
| 8 | Kids matter                            | <i>Salis by social elites and smajpoti</i>                        |

**iv. Conflict with FD**

There is a huge conflict between local people and local FDe, particularly with tree feller from various villages. Fig 30 shows the relative sources of conflict with FD and local people. Sometimes there are direct conflicts with tree feller during patrolling, sometimes lead into



exchanges of fire and even murder. The other causes of conflict arising with FD are forest and land encroachment, forest cases by local FD staff, prevention in resource exploitation. Giving any type privilege by local FD to any individual or group especially in the nomination process of headman also lead to a conflict in-between forest villagers/ local people and FD. The conflict with local people in Hnilla was very severe. Forest beat officer

of Moddahhnilla was killed in one occasion by tree poacher and eventually the beat office of Hnilla had to be shifted to Teknaf. In some of the beats new cause was noticed that created conflict with FD, which is the selection procedure of social forestry partner.

#### v Social cohesion and adhesion

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

#### 4.8.2 Demographic Profile

##### 4.8.2.1 HHs and population

Table 40 shows the settlement wise HHs number and total population. Among identified villages. Information could not be collected on the 33 settlements and Rohingas settlements. The total number of HHs of the identified villages having stakes with the GR is approximately 19617 and total population is about 119950. The average family size is 6.

**Table. 40. Villagewise distribution on HHs and population**

| SI No | Village        | HHs No | Estimated Population | Beat      | Location |
|-------|----------------|--------|----------------------|-----------|----------|
| 1     | Puranpara      | 638    | 4232                 | Shamlapur | Inside   |
| 2     | Notunpara      |        |                      | Shamlapur | inside   |
| 3     | Guschha gram   |        |                      | Shamlapur | Adjacent |
| 4     | Montoliapara   |        |                      | Shamlapur | Adjacent |
| 5     | Jhumpara       |        |                      | Shamlapur | inside   |
| 6     | Rohingapara    | N/A    | N/A                  | Shamlapur | Adjacent |
| 7     | Kerontoli      | 154    | 1070                 | Whykong   | inside   |
| 8     | Chammapara     | N/A    | N/A                  | Monkhali  | inside   |
| 8     | Gilatoli       | 106    | 623                  | Whykong   | Inside   |
| 9     | Chakmapara     | N/A    | N/A                  | Whykong   | Inside   |
| 10    | Katakhali      | 342    | 2186                 | Whykong   | Adjacent |
| 11    | Balukhali      | 342    | 2192                 | Whykong   | Adjacent |
| 12    | horikhola      | 118    | 678                  | Whykong   | Adjacent |
| 13    | Ulubonia       | 163    | 1158                 | Whykong   | Inside   |
| 14    | Tulatoli       | N/A    | N/A                  | Whykong   | Adjacent |
| 15    | Whykong        | 418    | 2496                 | Whykong   | Adjacent |
| 16    | Chakmapara     | N/A    | N/A                  | Whykong   | Inside   |
| 17    | Dhaingakata    | 227    | 1229                 | Whykong   | Inside   |
| 18    | Tanghaingapara |        |                      | Whykong   | Inside   |
| 19    | Lombagona      | 85     | 536                  | Roikhong  | Inside   |
| 20    | Laturikola     | 94     | 599                  | Roikhong  | Inside   |

| SI No | Village                       | HHs No | Estimated Population | Beat     | Location           |
|-------|-------------------------------|--------|----------------------|----------|--------------------|
| 21    | Amtoli                        | 105    | 619                  | Roikhong | Inside             |
| 23    | Lombabeel                     | 426    | 2648                 | Roikhong | Inside             |
| 24    | Unchiprang                    | 176    | 1117                 | Roikhong | Adjacent           |
| 25    | Roikhong                      | 175    | 1154                 | Roikhong | Inside             |
| 26    | Keruntoli                     | 207    | 1085                 | Teknaf   | Inside             |
| 27    | Puran Pollan Para             | 505    | 3019                 | Teknaf   | Adjacent           |
| 28    | Kaikkhalipara                 | 292    | 2061                 | Teknaf   | Adjacent           |
| 29    | Islamabad & natun Pallan para | 219    | 1267                 | Teknaf   | Adjacent           |
| 30    | Damdamia                      | 120    | 772                  | Teknaf   | Inside             |
| 31    | Teknaf Bazar                  | 371    | 1552                 | Teknaf   | Adjacent           |
| 32    | Naitongpara                   | 318    | 1865                 | Teknaf   | Adjacent           |
| 33    | Kharak Khali                  | N/A    | N/A                  | Teknaf   | adjacent           |
| 34    | Uttar jaliapara               | 266    | 1285                 | Teknaf   | adjacent           |
| 35    | daksin jaliapara              | 294    | 2044                 | Teknaf   | adjacent           |
| 36    | hangar para                   | 99     | 703                  | Teknaf   | adjacent           |
| 37    | daispara                      | 96     | 526                  | Teknaf   | adjacent           |
| 38    | oliabad                       | 264    | 1653                 | Teknaf   | adjacent           |
| 39    | Teknaf reserve forest         | 197    | 1008                 | Teknaf   | Inside to adjacent |
| 40    | hatir ghona                   | 237    | 1314                 | TK uni   | adjacent           |
| 41    | natun para                    | 200    | 1048                 | TK uni   | adjacent           |
| 42    | Baroitoli                     | 150    | 786                  | Teknaf   | Inside             |
| 43    | Nithongpara                   |        |                      | Teknaf   | Inside             |
| 44    | Lengurbeel                    | 312    | 1831                 | Teknaf   | Inside             |
| 45    | katabunia                     | 272    | 1538                 | Teknaf   | Near to adjacent   |
| 46    | Jahaliapara                   | N/A    | N/A                  | Teknaf   | Inside             |
| 47    | Hechapara                     | 189    | 1021                 | Teknaf   | Inside             |
| 48    | Dumdamiapara                  | 120    | 742                  | Mosuni   | Inside             |
| 49    | Jhadimurapara                 | 192    | 1132                 | Mosuni   | Inside             |
| 50    | Noyapara                      | 128    | 969                  | Mosuni   | Inside             |
| 51    | Chakmapara                    | N/A    | N/A                  | Mosuni   | Inside             |
| 52    | MoChunipara                   | 118    | 788                  | Mosuni   | Adjacent           |
| 53    | Noyapara Rohinga Camp         | N/A    | N/A                  | Mosuni   | Inside             |
| 54    | Dhakhin Ledha                 | 288    | 1815                 | Mosuni   | Inside             |
| 55    | Moidho Ledha                  |        |                      | Mosuni   | Inside             |
| 56    | Ledha Lamarpara               | N/A    | N/A                  | Mosuni   | Inside             |
| 57    | Ledha Puchingapara            | 256    | 1564                 | Mosuni   | Inside             |
| 58    | Purba Rongikhali              | 403    | 2813                 | Mosuni   | Inside             |
| 59    | Paschim Rongikhali            |        |                      | Mosuni   | Inside             |
| 60    | Uttar Ledha                   | N/A    | N/A                  | Mosuni   | Adjacent + Inside  |
| 61    | Dakhin Alikhali               | 292    | 1943                 | Mosuni   | Adjacent           |

| SI No | Village                   | HHs No | Estimated Population | Beat          | Location             |
|-------|---------------------------|--------|----------------------|---------------|----------------------|
| 62    | Moidho Alikhali           |        |                      | Mosuni        | Inside               |
| 63    | Ali Akborpara             | N/A    | N/A                  | Hnilla        | Inside               |
| 64    | Rojergona                 | N/A    | N/A                  | Hnilla        | Inside               |
| 65    | Marichagona               | 177    | 703                  | Hnilla        | Adjacent             |
| 66    | Ali khali                 | 292    | 1943                 | Hnilla        | Adjacent             |
| 67    | Villagerpara              | N/A    | N/A                  | Hnilla        | Inside               |
| 68    | Shikderpara               | N/A    | N/A                  | Hnilla        | Adjacent             |
| 69    | Uttarpara                 | N/A    | N/A                  | Hnilla        | Adjacent             |
| 70    | Dakhinpara                | N/A    | N/A                  | Hnilla        | Adjacent             |
| 71    | Konapara                  | 118    | 689                  | Hnilla        | Adjacent             |
| 72    | Majherpara                | 385    | 2492                 | Hnilla        | Adjacent             |
| 73    | Muslimpara<br>(Maughpara) | N/A    | N/A                  | Hnilla        | Outside              |
| 74    | Nikhang khali             | 496    | 3284                 | Hnilla        | Adjacent +<br>Inside |
| 75    | Chowdhurypara             | 138    | 717                  | Hnilla        | Outside              |
| 76    | Fulerdail                 | 410    | 2598                 | Hnilla        | Outside              |
| 77    | Pankhali                  | 480    | 3440                 | Hnilla        | Adjacent +<br>Inside |
| 78    | Kutubdiapara              | 90     | 593                  | Moidho Hnilla | Adjacent             |
| 79    | Khanjorpara               | 590    | 3590                 | Moidho Hnilla | Adjacent             |
| 80    | Karachipra                | 73     | 402                  | Moidho Hnilla | Adjacent             |
| 81    | Rajargona                 | 36     | 231                  | Moidho Hnilla | Adjacent             |
| 82    | Noyapara                  | 419    | 2513                 | Moidho Hnilla | Adjacent             |
| 83    | Jimongkhali               | 709    | 4585                 | Moidho Hnilla | Adjacent             |
| 84    | Purbo Satghariapara       | 160    | 1058                 | Moidho Hnilla | outside              |
| 85    | Paschim Satghariapara     |        |                      | Moidho Hnilla | Inside               |
| 86    | Purbo<br>Moheshkhaliapara | 513    | 3194                 | Moidho Hnilla | Adjacent             |
| 87    | Moheshkhalipara           |        |                      | Moidho Hnilla | Adjacent             |
| 88    | Komboniapara              | 180    | 1024                 | Moidho Hnilla | Inside               |
| 89    | Nachorpara                | 154    | 954                  | Moidho Hnilla | Outside              |
| 90    | Maughpara                 | 118    | 686                  | Moidho Hnilla | Outside              |
| 91    | Dakhin Dailpara           |        |                      | Shilkhali     | Inside               |
| 92    | Jahajpura Mathpara        | 358    | 2366                 | Shilkhali     | Inside               |
| 93    | Miarpara                  |        |                      | Shilkhali     | Inside               |
| 94    | Holbunia                  | 121    | 773                  | Shilkhali     | Adjacent             |
| 95    | Kaderpara                 |        |                      | Shilkhali     | Adjacent             |
| 96    | Uttaar Chakmapara         | 537    | 3591                 | Shilkhali     | Inside               |
| 97    | Dakhin Chakmapara         |        |                      | Shilkhali     | Inside+Adjac<br>ent  |
| 98    | Uttar Shilkhali           |        |                      | Shilkhali     | Inside               |
| 99    | Chokiderpara              |        |                      | Shilkhali     | Outside              |
| 100   | Rajar Chhara              | 345    | 2023                 | Rajar Chhara  | Inside               |
| 102   | Habib Chhara              | 363    | 2194                 | Rajar Chhara  | Inside               |

| SI No | Village           | HHs No | Estimated Population | Beat         | Location            |
|-------|-------------------|--------|----------------------|--------------|---------------------|
| 103   | Mithapanir Chhara | 133    | 712                  | Rajar Chhara | Inside              |
| 104   | Darga Chhara      | 111    | 712                  | Rajar Chhara | Inside              |
| 105   | Tulatoli          | 112    | 553                  | Rajar Chhara | Inside              |
| 106   | Hatirgona         | 237    | 1314                 | Rajar Chhara | Inside              |
| 107   | Lambari           | 476    | 2866                 | Rajar Chhara | Inside              |
| 108   | Kachchhapiapara   | 238    | 1419                 | Mathabanga   | Inside<br>+Adjacent |
| 109   | Karachipara       | N/A    | N/A                  | Mathabanga   | Inside<br>+Adjacent |
| 110   | Noakhali          | 419    | 2382                 | Mathabanga   | Inside<br>+Adjacent |
| 111   | Bordail           | 192    | 891                  | Mathabanga   | Inside<br>+Adjacent |
| 112   | Morisbunia        | 128    | 691                  | Mathabanga   | Inside<br>+Adjacent |
| 113   | Mathabanga        | 175    | 1070                 | Mathabanga   | Inside<br>+Adjacent |
| 114   | Hajompara         | 160    | 1016                 | Mathabanga   | Inside<br>+Adjacent |

Note: N/A denotes that 'data is not available'.

#### 4.8.2.2 Education

As reflected from FGD and KI interviews, adult literacy rate is 18% (But in the west side of the GR the rate is about 1-2% only). As per HH interview, about 86% people are illiterate. It seems that this is not the overall reflection of the actual situation. . About 42% people go to primary school, 15% go to High School and only 10% have above level education. In comparison in between the two sides, the people of eastside are more educated than the west side (sea side). Usually people are more interested in Madrasa education. In the west side especially at Shamlapur and Jahazpura, the rate of adult literacy is about only 1-2%, But at present most of the children are going to school or moktob. Women education rate is much worse in the area especially in west side.

In Rakhain ethnic community now a days about 90-95% children go to Primary School, about 30% go to High School and only 5% study in the colleges and above. Among the adult, literacy rate is about 50% (above 30 years of old). On the other hand, in the Tongchoinga ethnic community, the rate is however extremely low. The overall adult literacy rate is only about 7-10%. However, now days about 30-40 % children go to Primary School, about 8% go to High School and only 1% study in the colleges.

#### 4.8.2.3 Occupation

It was reflected from HHs interview that Agriculture is the main income source of 53% of household, followed by fishing and shrimp collection (30%), day labourers (10%) and others (7%). On the other hand 57% household has no secondary source of income, betel leaf cultivation (33%), day labourer (30%), fishing (30%) and others (7%).

#### 4.8.2.4 Trend in Change of occupation

There has been a change in the occupation of local people with time. Table 41 shows hows changes in different occupation have taken place with time. The major changes in occupation have taken place immediate after liberation in 1972. Illegal logging has greatly increased over the past 15 years as a local occupation. There has been a shift in occupation from agriculture to day labour, fuel wood collection, timber poaching and small business. Occupations, like timber trading, furniture shops, and carpentry etc. flourished in recent years. In the western part of the GR fishing and shrimp fry collection has emerged as main occupation.

**Table. 41. Trend in change in occupation in Teknaf GR area**

| Sl | Occupation                  | Before 1971 | Before 15 Years | Present | Remarks           |
|----|-----------------------------|-------------|-----------------|---------|-------------------|
| 01 | Agriculture                 | 00000       | 0000            | 000     |                   |
| 02 | Day Labourer                | 000         | 0000            | 00000   |                   |
| 03 | Business                    | 00          | 000             | 0000    |                   |
| 04 | Fuel wood Collector         | 00          | 000             | 00000   |                   |
| 05 | Illegal Poacher/tree feller | 00          | 000             | 00000   |                   |
| 06 | Service                     | 0           | 00              | 000     |                   |
| 07 | Timber Trader               | 0           | 00              | 00000   |                   |
| 08 | Carpenter                   | 0           | 00              | 00000   |                   |
| 09 | Sawmill operation           | 0           | 0000            | 0       |                   |
| 10 | Betel vine cultivation      | 0           | 00              | 00000   | Most in west side |
| 11 | Fishing                     | 000         | 000             | 0000    | West side         |
| 12 | Collecting Shrimp fry       | 0           | 00              | 00000   | West side         |
| 13 | Jum Cultivation             | 000         | 0000            | 000     |                   |

#### 4.8.2.5 Richness-poverty level

As revealed by FGD, about 80% people are landless; Most of them have homestead land that has been encroached from GR. Most of the people (70%) are very poor, 19% are poor followed by middle class (10%) and upper middle class/rich (1%). As per HH interview: 50% of the households are totally landless. About 50% households have homestead land of their own, on the other hand only 40% households own agricultural land.

#### 4.8.2.6 Unemployment

In average, 25% people in the locality are unemployed. Bhadra - Ashwin is the peak period for unemployment in the area. HH interviews indicated that about 27% people have some sort of work in the year round, but 73% people expressed that they become workless during certain periods of the year. As revealed by RRA exercises, the major causes for unemployment include lack of work opportunities in the locality, increased population, lack of skill development opportunities, local agricultural pattern, illiteracy etc.

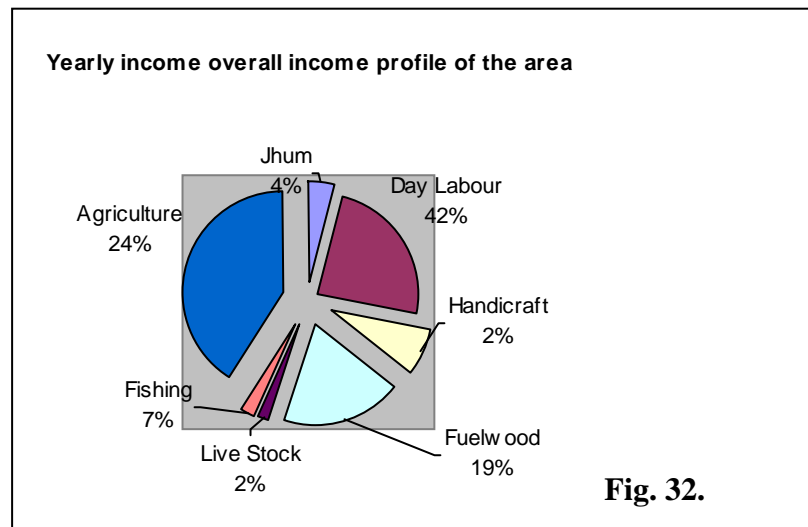
**“No Work No Food- is the followed principle in the area.”**

*-Rashid master, KI in Hnilla*

**“ When we don’t have any job and can not go to sea then usually we go to forest.”**

*-Zahangir, a forest villager of Shamlapur*

#### 4.8.2.7 Income and expenditure profile



##### i. Income profile

Fig. 32 shows the overall income profile of the project area. It was reflected from FGD that the main source of income of the area comes from day labour, followed by agriculture including betel vine cultivation, fuelwood collection, etc.

##### ii. Expenditure profile

The expenditure profile shows (Fig. 33) that people spend highest most of their income in purchasing food, purchase of followed by building materials, clothing, and cosmetics. However, they spend little money for health purpose.

##### iii. Livelihood expenses

In HH surveys respondents were asked whether they think that their earning is adequate to meet their family expenditure. In response 35% informed that their earning is quite adequate for managing their family expenses, while the rest 65% replied that it is not.

#### iv. Comparison of income and expenditure

Fig. 34 shows the comparison between monthly income and expenditure of a PRA exercised village. The figure shows that while in some places, such as in Shilkhali and Jahazpura, expenditure is higher than the income. On the other hand in Roikhong and Whykong income is higher than expenditure.

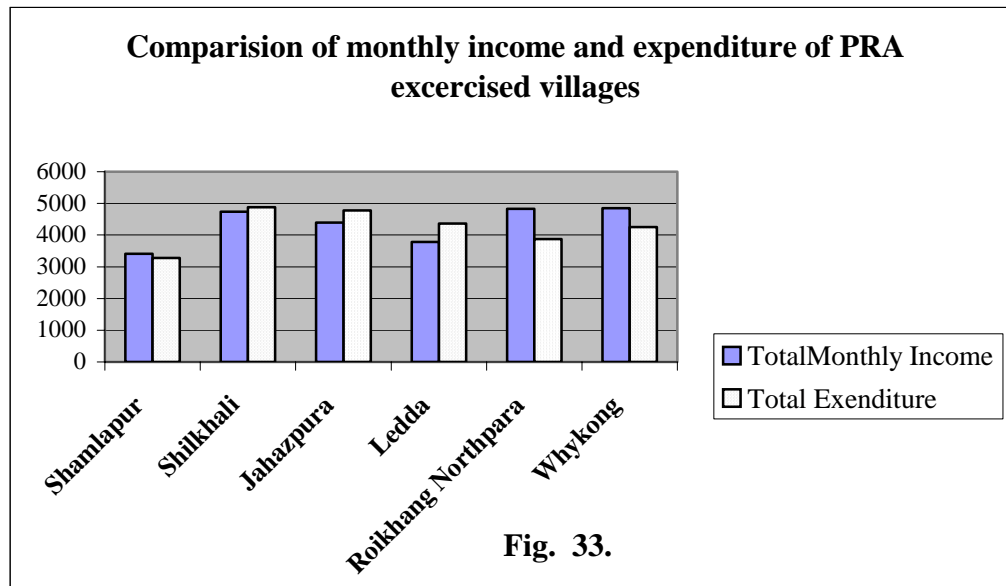


Fig. 33.

#### 4.8.2.8 Credit

In average, a 23% HHs have taken micro-credit from both NGO and bank sources. It is to be noted that in the western part of the forest (Samlapur and Jahajpura area) there is no credit opportunities, as there is no bank and NGOs in those aeras. NGO's credit programs are targeted to poor women. About 90% respondents indicated that it was not very hard to receive loans, particularly from NGOs. In the western part, people borrow money from their relatives and money lenders.

#### 4.8.2.9 Food Security

In this survey respondents were also asked whether they thought their household has a surplus or deficit household in terms of food consumption. Only 5% of the household indicated that they have a surplus of food, while 50% mentioned that they have neither deficit nor a surplus of food. 45 % of the households mentioned that they have a food deficit.



#### 4.8.2.10 IGA

There are little opportunities for alternate income generation activities in the western side of the GR, but in eastern side there are some opportunities for IGA, such as cane and bamboo works, fishing and salt production, handicraft, poultry and dairy etc.

#### 4.8.2.11 Skill and skill development opportunities

Only 13% people have skills for undertaking various supplementary income generating activities. However, this is very limited among the people in Shamlapur and Jahajpura. Some IGA skill development training programs carried out by different institutions. However, this opportunity for the people of Western part of the forest is very limited.

### *4.8.3 Social dynamics (Trend in changes in socio-economics)*

#### 4.8.3.1 General Dynamics

Table 42 shows changes in some key socio-economic matrices and local activities. Compared to 1970 situation, with increase in population, income of local people has increased with corresponding decline in solvency. Although, literacy rate has increased, unemployment rate has also increased. With time, use of forest for both as HH needs and income has increased. Local food scarcity has little bit increased while opportunities for alternate income has increased by manifolds.

**Table. 42. Trend in changes in some socio-economic matrices**

| Issue                    | Pre-1971 | 15 years ago  | Present | Causes for change   |
|--------------------------|----------|---------------|---------|---|
| Unemployment             | 00       | 000           | 00000   | Increasing pupulation, not creating as expected new Job   |
| Settlement/population    | 0        | 000           | 00000   | No family planning activity, Migration of people,   |
| Solvency/income          | 000      | 0000          | 00000   | population increased but not land and IGA   |
| Literacy                 | 0        | 00            | 000     | mass awareness on education after intervention of both Govt and NGO, Increasing the facilities of education and establishment of new institutions, govt various inceptive scheme as like primary sub- scholarship, female secondary assistance etc. |
| Livelihood expenditure   | 00       | 000           | 00000   | Increasing trend of the value of daily using goods.   |
| Use of forest for income | 00       | 00000 (80-92) | 0000    | Increasing population, availability of resources (land, trees, fuelwood etc) and easy to  |

|  |             |  |   |   |
|--|-------------|--|---|---|
|  |             |  |   | cope.   |
| Use of forest for HH needs                                 | 0000        | 0000   | 00000                                     | No significant changes has occurred, from the past people are using forest for their HHs needs. |
| Transportation and mobility                                | 0           | 000  | 00000                                     | New road construction and bus station set up, new transportation system introduced              |
| Homestead plantation                                       | 000         | 000  | 00000                                     | Tradition and NGOs intervention   |
| Food scarcity/starvation                                   | -           | 00   | 000                                       | Increased poverty   |
| Credit and IGA   | 00          | 000  | 0000                                      | Several NGOs and bank intervention  |
| Occupation   | Agriculture | Day labour, Agriculture, tree feeling, fishing | Agriculture, business, day labor, fishing |   |
| Damages by elephant  | 0           | 00   | 00000                                     | Decreases of forest and elephant food   |
| Livestock  | 000         | 000  | 00000                                     |   |
| Betel Leaf cultivation                                     | 0           | 000  | 00000                                     | Profitable  |
| Agricultural activities                                    | 00          | 000  | 0000                                      | More agricultural land has encroached   |
| Note: 5 circles to indicate highest abundance/intensities/ |             |  |   |   |

#### 4.8.3.2 Seasonal changes in socio-economics of the local people

Table 43 provides information on monthly changes in some socio-economic parameters and some resource extraction activities. Unemployment is higher during Baishakh-jaistha and during Poush-Magh. 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. Timber felling is inversely related to forest patrol.

**Table 43. Seasonal calendar for some resource extraction parametrs**

|                                     | Bais<br>hak | Jaist<br>hya | Asha<br>r | Shra<br>ban | Vadr<br>a | Ashyi<br>n | Karti<br>k | Agrah<br>ayan | Poush | Magh | Falg<br>un | Chaitra |
|-------------------------------------|-------------|--------------|-----------|-------------|-----------|------------|------------|---------------|-------|------|------------|---------|
| Unemploy<br>ment                    | 0000        | 0000         | 0000      | 000         | 00        | 0          | 0          | 0             | 0     | 0    | 00         | 000     |
| Accessibili<br>ty to forest         | 000         | 00           | 00        | 00          | 00        | 00         | 000        | 0000          | 0000  | 0000 | 0000       | 000     |
| Transporta<br>tion<br>problem       | 00          | 00           | 000       | 0000        | 0000      | 000        | 00         | 0             | 0     | 0    | 0          | 0       |
| Brickfield/<br>sawmill<br>operation | 00          | 00           | 0         | 0           | 0         | 0          | 00         | 000           | 0000  | 0000 | 0000       | 000     |
| Forest<br>patrol                    | 0000        | 000          | 00        | 00          | 00        | 00         | 000        | 0000          | 0000  | 0000 | 0000       | 0000    |

|                         |      |      |      |      |      |     |     |      |      |      |      |      |
|-------------------------|------|------|------|------|------|-----|-----|------|------|------|------|------|
| Agricultural activities | 0000 | 0000 | 0000 | 0000 | 00   | 0   | 0   | 0    | 00   | 00   | 00   | 000  |
| Timber felling          | 000  | 0000 | 0000 | 0000 | 0000 | 000 | 000 | 00   | 00   | 00   | 00   | 00   |
| Fuelwood collection     | 0000 | 000  | 00   | 00   | 00   | 00  | 000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| Bamboo                  | 00   | 00   | 000  | 000  | 000  | 00  | 00  | 00   | 00   | 00   | 00   | 00   |
| Building materials      | 00   | 00   | 0    | 0    | 0    | 0   | 00  | 00   | 000  | 000  | 00   | 00   |
| Hunting                 |      |      |      |      |      |     |     | 0    | 0    | 0    |      |      |
| Vegetable collection    | 000  | 000  | 000  | 000  | 00   | 00  | 00  | 0    | 0    | 0    | 0    | 0    |

Workload is higher in Boishak, - Bdra and Agrahayan for male. In case of women, they perform all the HH works and it is year round activity. Besides, in dry season some of them they work in field especially for chilli, watermelon cultivation and paddy harvesting in agrahayan .In the west side of the GR, women also collect shrimp fry from sea and also collect fuelwood from the fores (Table 44).

**Table 44. Seasonalities in some local activities in the area**

| Sl no |                       | Bai                 | jai               | Ash                 | Sra         | Bhad   | Ash          | kar | Agra                     | Pou | Mag | Fal | Chai       |
|-------|-----------------------|---------------------|-------------------|---------------------|-------------|--------|--------------|-----|--------------------------|-----|-----|-----|------------|
| 1     | Fishing               |                     |                   |                     |             |        |              |     |                          |     |     |     |            |
| 2     | Agriculture           | Harvesting Boro     |                   | T. aman cultivation |             |        | water millon |     | rabi crop and vegetables |     |     |     |            |
| 3.    | Betelvine cultivation |                     |                   |                     |             | Sowing |              |     |                          |     |     |     |            |
| 4     | Brickfield operation  |                     |                   |                     |             |        |              |     |                          |     |     |     |            |
| 5     | Labour                |                     |                   |                     |             |        |              |     |                          |     |     |     |            |
| 6     | service               |                     |                   |                     |             |        |              |     |                          |     |     |     |            |
| 7     | Jhum (katamoni paddy) | Burni ng the forest | Soil preparati on | Sowing              | Cultivation |        | harvesting   |     |                          |     |     |     |            |
| 8     | Sungrass              | Harve sting         | Dry & sell        |                     |             |        |              |     |                          |     |     |     | harvesting |

#### 4.8.3.3 Constraints and Opportunities of livelihood

Although there are constraints in maintain livelihood, however, there are also opportunities for them to improve their livelihoods. Table 45 provides some information on the constraints and opportunities for the locality to improve their livelihood.

**Table 45. Constraints and opportunities for improvement of livelihood**

| Constraints   | Opportunities   |
|---|---|
| <ul style="list-style-type: none"> <li>• Most of local people are illiterate</li> <li>• Mass poverty</li> <li>• high rate of seasonal unemployment.</li> <li>• High fee for health treatment because no health center is available in the village</li> <li>• Corruption in FD taking fee for collecting fuelwood</li> <li>• limited job opportunities outside the village.</li> <li>• Money lender provides high-interest loan,</li> <li>• Over dependency on forest</li> <li>• Loans from credit agencies (supported by NGOs) require guarantee/collateral.</li> </ul> | <ul style="list-style-type: none"> <li>• Have hard-working community</li> <li>• Credit available for local people</li> <li>• Increasing job opportunities for resource poor farmers from IGA</li> <li>• opportunity to develop eco-tourism</li> <li>• Labor sharing in agricultural production</li> <li>• Loans can be redeemed with labor</li> <li>• Government provides rice seedlings</li> <li>• <b>Open access to fishing lots released as common fishing grounds</b></li> <li>• Loan facilities from fish traders who trade with fish farmers occasionally.</li> <li>• But fish farmers have to sell fish to them in lower price.</li> </ul> |

#### 4.8.4 Problem Analysis

Table 46 lists the local level problems and their possible solutions.

**Table. 46. Information on local problems and enquiry into its solutions: exercise from east side of the GR**

| Name of Problem        | Reason  | Solution  |
|------------------------|---|---|
| Poverty/ food shortage | Unemployment, lack of capital to initiate business, Lack of income generating activities. | Should create new IGA and provide credit without interest. Should give employment opportunity.  |
| Unemployment           | Over population, Lack of education, lack of skill and opportunity of work                 | Vocational education should be introduced and should create new income opportunity through IGA. |
| Cultivation            | There are various problems to set up sawmill machine.                                     | Should be managed properly  |
| Education              | There is no sufficient educational institution, they are not conscious about education.   | Educational organization will be increased and they should be made aware.                       |
| Rohinga problem        | They are totally dependent on forest for their livelihood.                                | They should be obstructed to enter our country.   |
| Forcible occupation    | for greedness   | Should be applied law.  |

|   |  |  |
|---|--|--|
| Over Population                                 | Population increasing rate is high, lack of education, awareness & entertainment system are the main cause of population increasing and illegal appearance of Rohingya | Should take awareness program as well as family planning program should be popularized and should be stopped the illegal coming of Rohingas. |
| Polygamy  | Unemployment, lack of education, Hobby, Religious fanaticism.  | Polygamy should be closed awareness should be created about the impact of polygamy.  |
| Dowry   | It is a social issue,  | Awareness should be created and should be enacted.   |
| Early marriage                                  | Unemployment, lack of education, social customs  | Early marriage should be closed.   |
| Fuel wood scarcity                              | There is no big trees in the forest,   | Trees will be planted in the forest.   |
| Thief/Robber                                    | Loose law and order situation, Poverty, unemployment.  | Robbery should be protected by the Chairman and M.P  |
| Drinking Water                                  | Due to the lack of deep tube well, peoples are not getting pure drinking water.  | Government should take necessary steps for setting up deep tube well.  |
| Health and treatment facilities                 | Not having good doctor and clinic/hospital   | Should establish community clinic  |
| Sanitation                                      | Not having healthy and safe sanitation system to the maximum poor household.   | Should take necessary steps to provide safe sanitary wares.  |
| Water   | Maximum water is saline  | Pond will be digging in the mouth of Chhara.   |
| Wild lives (especially human-elephant conflict) | During the paddy-harvesting period, wild boar and monkey make huge damages of the paddy field and eat the ripe paddy.  | Should create necessary shelter with food inside the WS through plantation.  |

#### 4.8.5 Local level expectations

All stakeholders strongly requested to address on three immediate needs, namely, reduction of poverty, , creation of employment opportunities through providing skill training and initiating AIG activities and finally establishment of health care center in the villagse, with assistance from related institutions such as NGOs and development programs. Table 47 presents the proposed interventions and outcomes of these three issues.

Figure 35 presents the summary analysis of livelihoods framework in the study area. The proposed intervention, solutions and outcomes of livelihoods strategy are also illustrated in

this diagram. Once the outcomes have been achieved, all five capital assets in this area would be improved and the living standard of people would be better.

**Table. 47. Outcomes of Proposed Intervention**

| No | Proposed intervention           | Outcomes         |                 |                       |                         |   |
|----|---------------------------------|------------------|-----------------|-----------------------|-------------------------|---|
|    |                                 | Increased Income | Improved Health | Reduced vulnerability | Increased Food security | Sustainable natural resource management |
|    | Reduced poverty                 | √                | √               | √                     | √                       | √                                       |
|    | Provision of IGA and capital    | √                | √               | √                     | √                       | v                                       |
|    | Provision of health care center | √                | √               | √                     |                         |   |

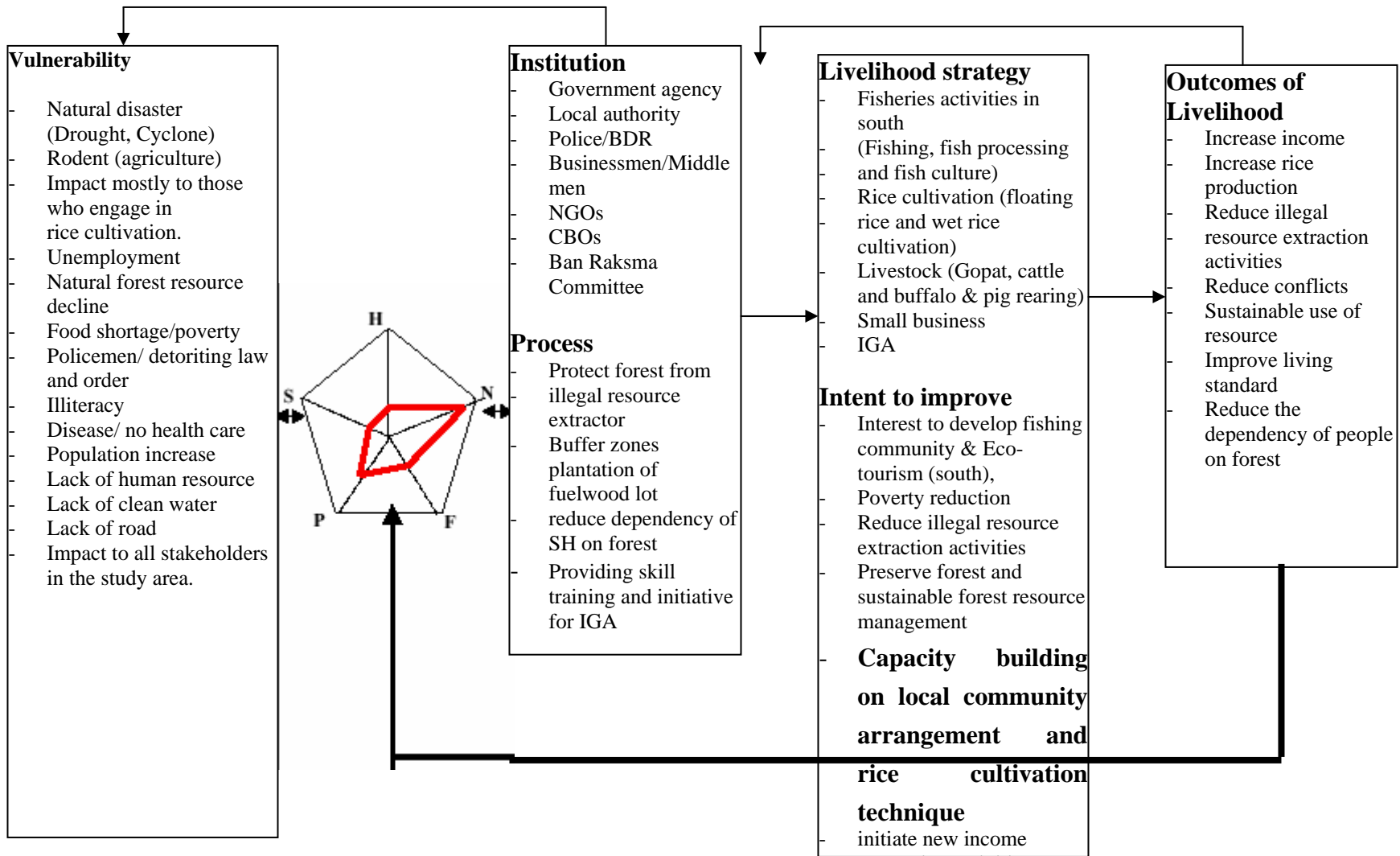


Figure. 34. Livelihood Framework Analysis

#### 4.8.6 Gender Issue

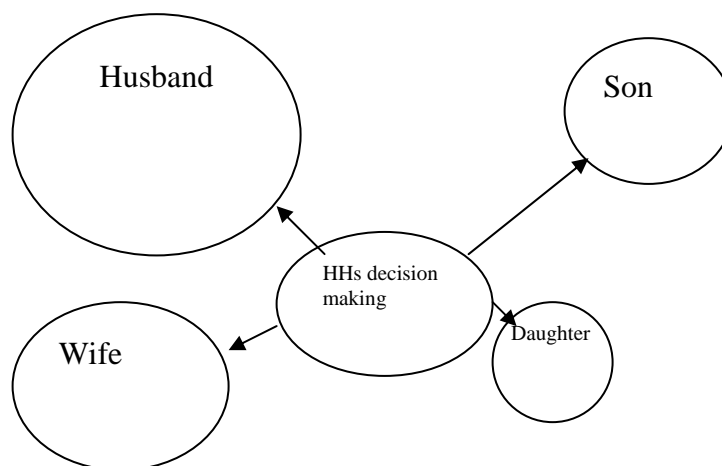
##### 4.8.6.1 HH decision making

Table 48 shows the role of different family members in taking HH decisions and Fig. 36 shows their relative influence in decision making. In GR area, the husband takes the major HH decisions, followed by wife and sons. Daughters are rarely consulted in decision making. Women of ethnic community have comparatively more role in many HH decisions making, particularly in Tongchoinga and Rakhain ethnic communities.

**Table. 48. Decision-making role of male and female in the family of Teknaf (East)**

| Name of decision                    | Husband** | Wife | Father | Mother | Elder Brother | Younger Brother | Son | Daughter |
|-------------------------------------|-----------|------|--------|--------|---------------|-----------------|-----|----------|
| Marriage                            | 00000     | 00   | 000    | 0      | 0             |                 | 00  |          |
| Sowing crops                        | 00000     | 00   | 000    |        | 0             | 0               | 00  |          |
| Land                                | 00000     | 00   | 00     | 0      | 0             |                 | 000 |          |
| Land selling                        | 00000     | 00   | 000    | 0      | 00            | 0               | 000 |          |
| Treatment                           | 00000     | 0000 | 000    | 000    | 00            | 0               | 00  | 00       |
| Trees                               | 00000     | 000  | 00     | 00     | 00            | 00              | 000 | 0        |
| House making                        | 00000     | 000  | 000    | 00     | 00            | 0               | 00  |          |
| Cattle Purchase                     | 00000     | 000  | 00     | 0      | 00            | 0               | 000 |          |
| Loan                                | 00000     | 000  | 000    | 0      | 0             | 0               | 00  |          |
| Savings                             | 00000     | 000  | 000    | 0      | 00            | 0               | 000 |          |
| Vote casting                        | 0000      | 0    | 0000   | 0      | 0000          | 00              | 00  |          |
| General expenditure                 | 00000     | 0000 | 000    | 00     | 000           | 0               | 00  | 0        |
| Resource collection from the forest | 00000     | 000  | 000    | 0000   | 00            | 00              | 00  | 0000     |

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



**Fig. 35. Ven diagram: family decision-making**



#### 4.8.6.2 Outdoor mobility and access to credit and IGA

Table 49 and 50 shows that the women of the area have moderate outdoor mobility and spend much of the time within the homestead. Participation to social events and also in education by women is comparatively much less than males. But in the cases of IGA & credit, the women have much higher access than the man. The cause behind this is that the credit providing organizations or NGOs prefer female than to male for providing credit. Women are discriminated in case of employment in jobs, business etc. But in the ethnic communities, the picture is different, the women are more involved in income generation activities than the males.

**Table. 49. Mobility and participation in social events and access to credit and IGA by male and female in GR area (west).**

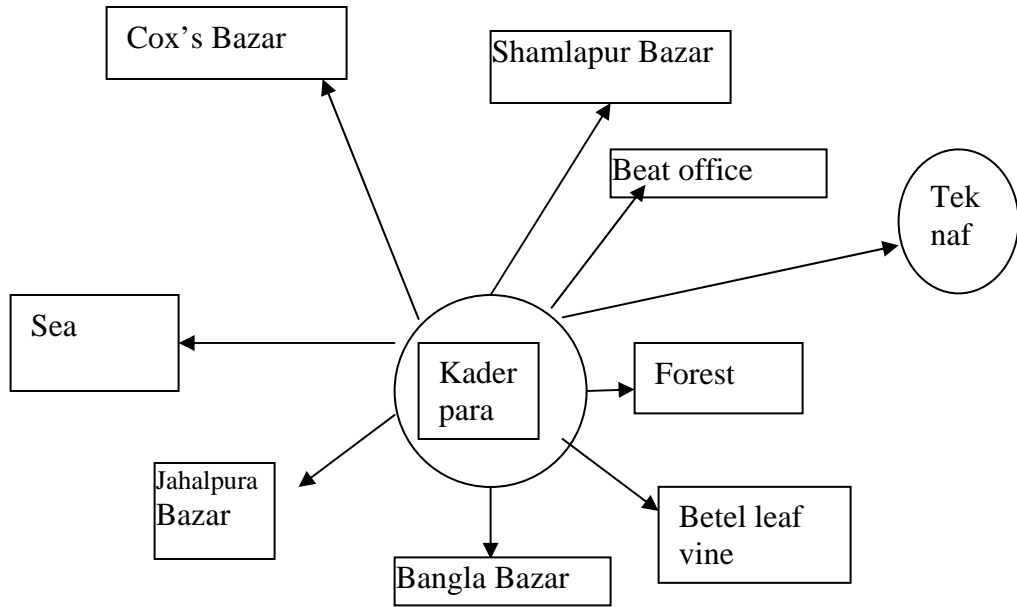
|        | Outdoor mobility | Participation in social events | Access to credit | Access to IGA | Education | Employment |
|--------|------------------|--------------------------------|------------------|---------------|-----------|------------|
| Male   | 00000            | 00000                   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

**Table. 50. Mobility and participation in social events and access to credit and IGA by male and female in Teknaf GR (east)**

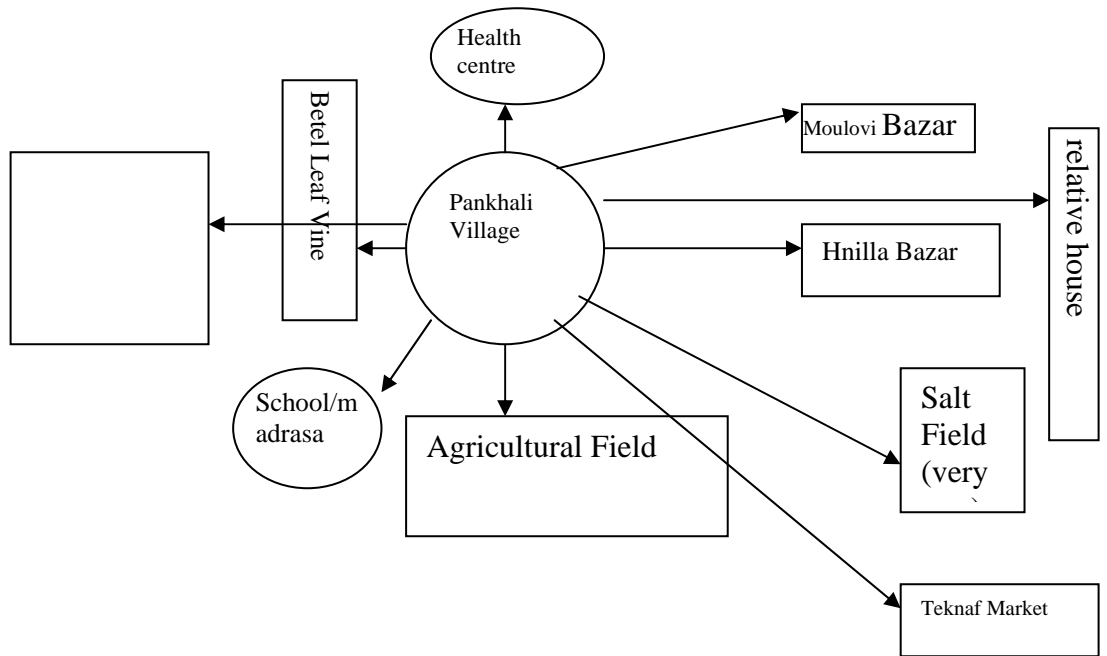
|        | Participation in social events | Outdoor mobility | Access to credit | Access to IGA | Education | Employment |
|--------|--------------------------------|------------------|------------------|---------------|-----------|------------|
| Male   | 00000                          | 00000     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

#### 4.8.6.3 Mobility map

Fig 37 shows the mobility map of man and Fig 38 shows the mobility map of women of a PRA exercised village. The figures show that in Pankhali village the women have access to education, forest or even to agricultural field.



**Fig. 36. Mobility map of men at the village of Kaderpara**



**Fig. 37. Mobility map of women of a village called Pankhali village**

#### 4.8.6.4 Workload of Local Male and Female

Generally, the in the Bangalees family, men have more work during Jaistha to Bhadra and again during the winter months. The females have more work during the dry months and these periods correspond to the local agricultural activities. However, in the tribal community, in all months the women have more work than men except the month of agrahayan. In general, women in the locality have a lower workload than the men. Table 51 and Table 52 show the seasonal workload of male and female of the two side of the GR. there exist quite difference in this two side that in west side women work load is highest at ashar, agrahayan and poush where as the women load are highest in the east is in baishakh and sraon month repectively.

**Table. 51. Seasonal workload of male and female for west side**

| Months<br>Sex | Baishakh | Jaistha | Ashar | Shrabon | Bhadra | Ashwin | Kartic | Agrahayan | Poush | Magh | Falgun | Chaitra |
|---------------|----------|---------|-------|---------|--------|--------|--------|-----------|-------|------|--------|---------|
| Male          | 0000     | 0000    | 0000  | 0000    | 0000   | 0000   | 0000   | 0000      | 0000  | 0000 | 0000   | 0000    |
| Female        | 0000     | 0000    | 0000  | 0000    | 0000   | 0000   | 0000   | 0000      | 0000  | 0000 | 0000   | 0000    |

**Table. 52. Seasonal workload of male and female of Teknaf (East)**

| Months across the column<br>Sex | Baishakh | Jaistha | Ashar | Shrabon | Bhadra | Ashwin | Kartic | Agrahayan | Poush | Magh  | Falgun | Chaitra |
|---------------------------------|----------|---------|-------|---------|--------|--------|--------|-----------|-------|-------|--------|---------|
| Male                            | 0000     | 0000    | 0000  | 0000    | 0000   | 0000   | 0000   | 00000     | 00000 | 00000 | 00000  | 00000   |
| Female                          | 0000     | 0000    | 0000  | 0000    | 0000   | 0000   | 0000   | 00000     | 00000 | 00000 | 00000  | 00000   |

#### 4.8.6.5 Daily Activities

During PRA the men did an activity profile for women, which are presented in the Table 52.

**Table. 53. Daily activity profile of women and men**

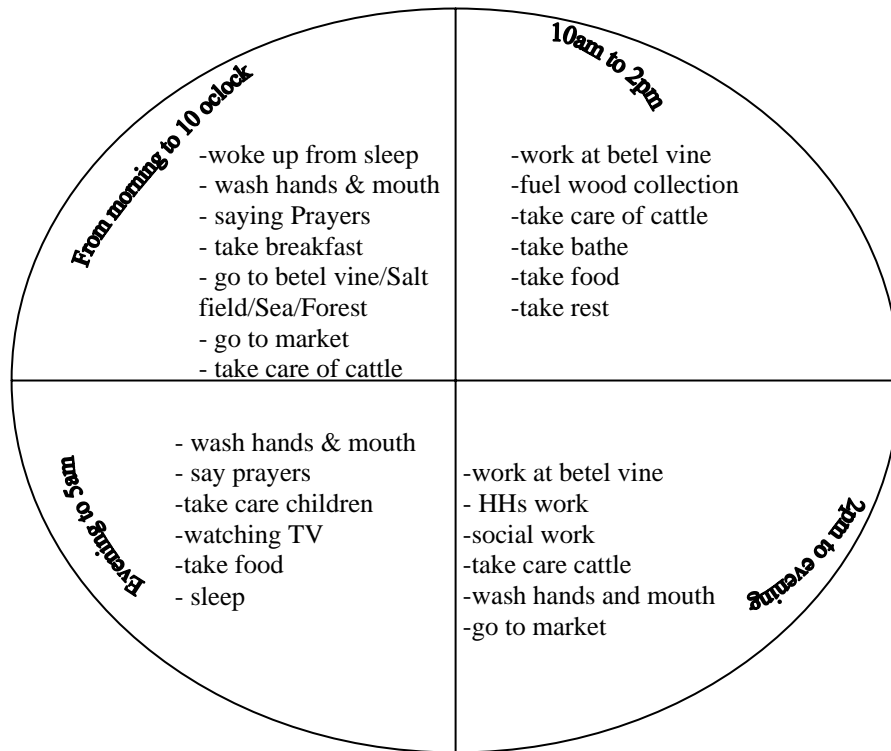
| Activity                                      | Time                   | Done by whom | Where done                  |
|---|------------------------|--------------|-----------------------------|
| Waking up - prayer                            | 5.00 am.               | W            | Home                        |
| Break fast - children                         | 5.30 am.               | W & g        | Home                        |
| Fetching water                                | 6.00 am.               | W & g        | River, Sea,<br>Chara        |
| Milking                                       | 7.00 am.               | W            | Home                        |
| Breakfast (babies/adults)                     | 7.30 a.m               | W & M        | Home                        |
| Cleaning houses                               | 8.00 a.m               | W            | Home                        |
| Washing clothes                               | 8.30 a.m               | W & g        | Home                        |
| Washing utensils                              | 9.00 a.m               | W & g        | Home                        |
| Tethering livestock                           | 9.30 a.m               | W & M        | Home                        |
| Shamba/ farm                                  | 9.00 a.m- 12.00<br>p.m | W & M        | Shamba                      |
| Preparing lunch                               | 12.00 p.m-<br>1.00p.m  | W & g        | Home                        |
| Eating dinner                                 | 1.00 p.m.              | W, M &       | Home                        |
| Grazing & watering<br>animals                 | 1.00 p.m- 2.00<br>p.m. | M& b         | Shamba/ River               |
| Washing utensils                              | 1.00 p.m- 2.00<br>p.m. | W& g         | Home                        |
| Resting (breast feeding,<br>Tending children) | 2.00p.m -2.30<br>p.m.  | W            | Home                        |
| Fellowship/market                             | 2.30 p.m- 4.00<br>p.m  | W & M        | Home<br>(Kimondo<br>market) |
| Fetching firewood,<br>vegetables, flour       | 4.00 p.m -4.30<br>p.m  | W & g        | Shamba<br>(Kimondo)         |
| Prepare evening meal                          | 6.00 p.m- 7.00<br>p.m  | W & g        | Home                        |

| <b>Activity</b>  | <b>Time</b>           | <b>Done by whom</b> | <b>Where done</b> |
|--|-----------------------|---------------------|-------------------|
| Eating dinner  | 7.00 p.m - 8.00 p.m   | W, M, b & g         | Home              |
| Time with children   | 8.00 p.m- 9.00 p.m    | W & M               | Home              |
| Bed time tea (husb and wife)<br>- Reason; planning for tomorrow<br>- Days briefing | 9.30 p.m              | W & M               | Home              |
| Sleep  | 10.00 p.m - 10.30 p.m | W & M               | Home              |

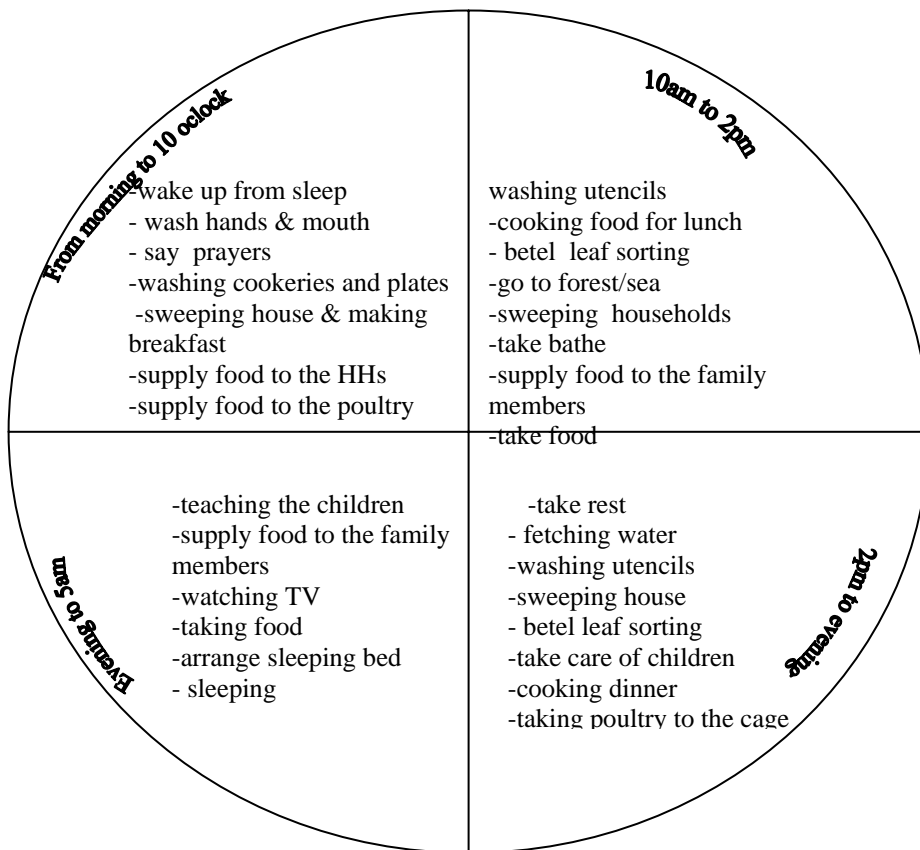
It was interesting to note that the men preferred to do an activity profile for the women and not for themselves. The information they gave was quite similar to what the women themselves gave.

#### 4.8.6.6 Daily work load

Fig. 39 and Fig. 40 show the daily work chart of male and female in the area. The females are typically involved with the household work and also help in the weaving and outside works. The males mainly do the outdoor works related to income generation.



**Fig. 38. Daily work chart of men of Teknaf GR**



**Fig. 39. Daily work chart of a woman of Teknaf GR**

#### 4.8.6.7 Forest resource collection by Male and female: a comparison

The women were asked to list the products they get from the forest and their use (whether for income or home consumption). The table 54 represents their responses:

**Table. 54. Resource collected by Different gender Groups from the GR**

| User<br>(Resource)                         | Men   | Women | Boys  | Girls |
|--|-------|-------|-------|-------|
| Trees                                      | 00000 | 00    | 000   |       |
| Water                                      |       | 0000  | 0     | 0000  |
| Stones                                     | 00000 | 0     | 00    | 0     |
| Livestock rearing and collection of fodder | 0000  | 00000 | 0000  | 0     |
| Land                                       | 00000 | 0     | 0     |       |
| Fuel wood                                  | 00000 | 0000  | 00000 | 000   |
| Honey                                      | 000   |       | 0     |       |
| Vegetables                                 |       | 00000 | 0     | 000   |
| Fruits                                     | 00000 | 00    | 0000  | 000   |
| Dry leaf                                   |       | 0     | 000   | 00000 |
| Sungrass                                   | 00000 | 00    | 0000  | 0     |

#### 4.8.6.8 Education

Overall literacy rate is higher in case of males than females. In the recent years the number of school going girls are higher than the boys. However, in case of higher studies girls are much more behind the boys (Table 55).

**Table. 55. Comparison of educational status of male and female in Teknaf area**

| Overall literacy<br>(based on adult) |     | Educational level (based on students) |           |          |       |          |
|--------------------------------------|-----|---------------------------------------|-----------|----------|-------|----------|
|                                      |     | Primary                               | Secondary | Colleges | Above | Informal |
| Male                                 | 20% | 70%                                   | 20%       | 11%      | 5%    | 5%       |
| Female                               | 15% | 85%                                   | 30%       | 8%       | 2%    | 3%       |

#### *4.8.7 Local Level Awareness and Behavior*

##### 4.8.7.1 Local level awareness

The perception of the local people about resource degradation and its impact is very good. In GR area, people are aware of forest resource and forest cover degradation and about its adverse impacts. They have a positive attitude towards conservation. However, few of them know about the rules, regulations of the game reserve. As revealed from HHs interview, 100% people think that the forest resources should be preserved / conserved so that they can procure resources in future. Perception of the local people about the resource degradation and its impact on their life and livelihood is moderate.

Most local people are against the protection of elephant. They are only in favour of plantation. It is interesting to note that the field level forest personnel (such as forester and beat officer) also have no clear idea on the game reserve. Even, they do not know about the boundary of the game reserve. Local community expressed their willingness to be involved in the process of forest conservation.

It revealed from HH interview that 90% of people of the area support the Government's plans for conservation of forest biodiversity and timprovement of the socio-economic conditions of the local people. Most of the inhabitants have land inside the GR and therefore apprehend that if the forest is preserved than their livelihood may be hampered.

As revealed from FGD and HH interview that almost all people know that the forest is a reserve, but only 45% of them have heard a little about the game reserve but not aware about the restrictions. However, only 10% people know about some restrictions in the GR.



#### 4.8.7.2 Behavioral aspect

Initial response of local people towards the project is positive, particularly in Whykong, Jahajpura and Shamlapur areas. However, some people including some FD staff, appeared to be hostile against the project. In particular, Range Officer, Teknaf, expressed that there was no need of project of such nature.

There are two ethnic communities, Tongchoinga live inside and Rakhain live adjacent to the GR. These ethnic communities are well behaved and cooperative. Perception about the resource degradation and its impact is good.

Most of the local Bangalees are also good people. However, some of them appeared rude. Reaction to NSP is mixed. Some people expressed their concern that if the program affects the livelihood of local people they will not cooperate and may oppose the program. Initial response of the local people and most of the FD staff towards the project is very positive and villagers are willing to cooperate.

### **4.9 Legal aspects and access to the forest**

#### *4.9.1 Law enforcing mechanism*

Overall, law and order situation in the area is deteriorating. Manpower of FD for managing the GR is inadequate, as a result forest patrol is inadequate and FD staff are not capable of facing the armed gangs of illegal timber extractor and land encroacher. Revealed from FGD, according to the villagers, FD staffs are corrupt and help in illegal felling and land encroaching by the villagers and outside influential persons. Huge numbers of forest cases are existed in the area. In Jahazpura, almost there have forest case against every households accepts few. Sometimes forest cases are filed against innocent villagers and this activity fell them in the cycle.

Presence of several groups of bandits in the eastern part such as Whykong, Hnilla and Teknaf of the GR restricts not only the movement of the FD staff, but also of the local people. However, bandits have negotiating relation with the tree poacher, particularly in the eastern part of the GR (Mouchuni, Maddhy Hnilla, Hnilla and Teknaf). So, the control of the FD has become much loosened. Sometimes, local FD staff makes negotiation with local

people, particularly with the land encroacher as they have no other option. The FD staff in Hnilla and Moddahhnilla feels insecure. Thus Hnilla beat office has been transferred to Teknaf. Sometimes armed gangs attack the forest office. Few days ago of the survey, the Beat Officers of Moddahhnilla was murdered in broad daylight in presence of hundred of people in his office by local terror syndicate.

In short local Police provide little or no protection to the GR. However, they have lot of interest in it. As per local people, their enthusiasm in forest protection goes against the forest conservation. As revealed from FGD that police patrols around the forest and make negotiating arrangement with extractor of forest resources. Sometimes, local police takes money when trucks with illegal timber are caught red handed by them.

BDR has a positive role in forest conservation. Though the GR has boundary with the neighboring country Myanmar, so in the border side BDR patrols along Naf River and their check post help in forest protection to some extent. In recent months, on the request of FD, BDR raided the local sawmills and seized 6 of them. They also help in the prevention of extraction of stones and gravels. BDR has some camps along the Naf river adjacent to the GR. BDR usually patrol and cease illegally transported timber or sometimes visit the local sawmills to recover the illegal timber. According to the FD and local community that BDR are helpful and cooperative with regard to forest protection.

#### *4.9.2 Legal aspect and access*

A large number of settlements are located inside or adjacent to the GR, so it is difficult to restrict the human access into the GR. Besides, there are large number of forest trails and few roads that facilitate the movement of local people inside of the GR. For example, in Hnilla beat, there is about 3 hundred trails and roads that traverse the forest area. As a result local people can easily enter into the forest.

During RRA sessions, respondents were asked whether they have easy access to GR. In response 96% replied that they have easy access to forest.. Similarly, 98% people informed that anyone could go to forest to collect resources and can collect any types of resources except big trees. There is virtually no restriction for collection of resources except timber

trees. The major routes used by people for collection of resources from the GR are shown in Fig. 20.

As reflected in HH interview that 100% people are aware about tree poaching from the forest. They mentioned the names from where the tree poacher come (villages). Most of the people (90%) feel that the Forest Department people are not protecting the forest resources according to the rules.

Although access is not legally permitted but usually villagers enter the GR forest by paying a levy between taka 5 to 10 to FD staff for one head or shoulder load of fuelwood. However, the local FD staff denied this.

#### *4.9.3 Peoples view towards FD*

The overall attitude of people towards FD is negative. As per local people, local FD staff know the names of major tree poachers, but often they do not take action against them. The local people including the illegal tree poacher and forest villagers also blamed the FD for destructing the forest. They local people raised questions that in the Pakistan period no one could enter into the forest without the prior permission of FD. But now a days how can the people enter into the forest and collect resources? They also informed that the FD has negotiation with the tree poacher. But this was not verified by the PRA team.

### **4.10 FD's forest management regimes: current status and situation**

#### *4.10.1 Forest managements*

The Teknaf GR is managed under Cox'sbazar south Forest Divisions, consisting 3 Range (from FGD at DFO office, Cox's Bazar). Table 56 shows the range wise beat office names.

**Table. 56. Range and Beat of Teknaf GR**

| Sl | Range Name | No. of Beat | Beat name                                | Remarks   |
|----|------------|-------------|--|---|
| 1  | Teknaf     | 4           | Teknaf, Muchany, Hnilla, Moddah Hnilla   | informal Forest check post by the RO and another with informally Damdomia BDR check post. |
| 2  | Shilkhali  | 3           | Shilkhali, Mathabhanga, Rajarchara       |   |
| 3  | Whykong    | 4           | Whykong, Raikheong, Shamlapur, Monkhali, | Karuntoli patrol camp & also an informal Forest check post by the RO                      |

#### 4.10.2 Land area and manpower

The table 57 and table58 represent the beatwise land area and manpower for managing the forest. It is interesting to note that in Hnilla beat, total land area is 860.06 Ha and is managed by only a forester.

**Table. 57. Beatwise landarea of tekna GR**

| Range     | Beat                  | Area (Ha) |        |         |
|-----------|-----------------------|-----------|--------|---------|
|           |                       | RF        | PF     | Total   |
| Teknaf    | Teknaf                | 1334.05   | -      | 1334.05 |
|           | Muchani               | 2157.04   | 45.02  | 2202.06 |
|           | Hnilla                | 836.44    | 23.62  | 860.06  |
|           | Moddah Hnilla         | 1720.64   | 507.52 | 2278.16 |
| Shilkhali | Shilkhali             | 749.80    | -      | 749.80  |
|           | Rajarchara            | 1352.23   | 6.79   | 1359.20 |
|           | Mathabhanga           | 854.25    | 52.28  | 9.6.53  |
| Whykeong  | Whykong               |           |        | N/a     |
|           | Karuntoli petrol post |           |        | N/A     |
|           | Raikheong             | 1772      |        | 1772    |
|           | Samlapur              | 838       |        | 838     |
|           | Monkhali              |           |        | N/A     |

**Table. 58. Manpower involved in management of Teknaf range**

| Range        | Beat                     | Manpower |     |           |    |                 |      |          |    |       |
|--------------|--------------------------|----------|-----|-----------|----|-----------------|------|----------|----|-------|
|              |                          | R        | DRo | BO/<br>F  | FG | bnaglo<br>Guard | Mali | MLS<br>S | BM | Total |
| Teknaf       | RO                       | 1        |     |           |    |                 |      |          |    | 01    |
|              | Teknaf                   |          | 01  |           | 02 |                 | 2    |          | 01 | 05    |
|              | Muchani                  |          |     | 01        | 01 |                 |      |          |    | 02    |
|              | Hnilla                   |          |     | 01        |    |                 |      |          |    | 01    |
|              | Moddah<br>Hnilla         |          |     | 1         | 01 |                 | 02   |          |    | 04    |
| Shilkhali    | RO                       | 0        |     |           |    |                 |      |          |    | 0     |
|              | Shilkhali                |          | 01  |           | 02 |                 | 02   |          |    | 05    |
|              | Rajarchara               |          |     | 01        | 01 |                 | 01   |          |    | 03    |
|              | Mathabhang<br>a          |          |     | 01        | 02 |                 | 01   |          |    | 04    |
| Whykeon<br>g | RO                       | 01       |     |           |    |                 |      |          |    | 01    |
|              | Whykong                  |          | 01  |           | 02 |                 |      | 01       |    | 04    |
|              | Karuntoli<br>petrol post |          |     | 1<br>(OC) |    |                 | 1    |          |    | 02    |
|              | Raikheong                |          |     | 01        | 04 |                 | 01   |          |    | 06    |
|              | Samlapur                 |          |     | 01        | 01 |                 | 01   |          |    | 03    |
|              | Monkhali                 |          |     | 01        | 02 | 01              |      |          |    | 04    |

The table 58 expresses the lack of manpower in GR management. It was calculated by the team that at present, 258.11 ha of land is managed by only one staff of the GR.

## 5. PRESENT THREATS, ISSUES AND CHALLENGES FOR NSP

### 5.1 Major Threats to the GR

- Continued unsustainable harvesting of most forest resources, including timber, fuel wood and bamboo which has led to disappearance and decline in many forest natural resources. Extraction is being carried out by local communities, organized illegal loggers and Rohingya refugees. Continued pressures (e.g. fuel wood collection) on secondary scrub are preventing regeneration of natural forests.
- Clearing of scrub vegetation for claiming land for plantation by FD and its subsequent weeding and repeated burning for Jhum cultivation by ethnic community are contributing towards reduced biodiversity and changes in the landscapes.
- Heavy and illegal use of fuel wood and timbers by adjacent brickfields.
- Hunting of wildlife, especially wild boar and barking deer, and other wildlife by the ethnic community resulting in the depletion, even in the extinction of these wildlife species.
- Encroachment of forest land and its subsequent conversion to settlement and agricultural land and betel leaf cultivation etc. leads to habitat loss resulting in the decline in forest biodiversity.
- Grazing by cattle, buffalo, goat and sheep which eliminates seedlings and prevents forest regeneration.
- FD's plantation strategies and practice include clearing and burning of forest, plantation only valued timber tree, exotic tree and monoculture probably caused most harm by removing the indigenous species, wilderness, creation of alien environment for the wildlife resulting in the serious depletion in forest biodiversity.
- Increasing development of infrastructures, including road network inside and around the GR and other resulting in increased access to and removal of forest resources.
- Settlement of Rohingya and around the GR and their activities has a detrimental impact on the forest and still remains as an important threat
- Operation of brickfield around the GR has a great indirect role in forest degradation as they use huge quantity of fuelwood

## **5.2 Issues of Concern**

### *5.2.1 Poor Forest regeneration*

Forest regeneration is severely impacted in the Teknaf GR, primarily due to fuelwood collection, clearing and burning of forest for plantations, betel leaf cultivation, shifting cultivation and claiming of land for agriculture, and grazing by livestock. This poses a threat to attaining wilderness resulting in the loss of forest biodiversity. In order to bring back wilderness forest regeneration aspect should be given a priority.

### *5.2.2 Land encroachment and expansion of settlements in the forest*

Land encroachment and its conversion into settlements, agricultural land and betel vine yards has been identified as the major cause for degradation to Teknaf GR. The process is still continuing and remains as an important threat to forest and its biodiversity. Future success of GR management will depend largely on the stopping and recovery of the encroached land.

### *5.2.3 Over and unsustainable resource exploitation*

Over exploitation of various resources of the forest, including timber, building materials, fuelwood, wildlife etc. in the past mainly contributed to the depletion in the resources and the fauna they supported. Still these remain as threats equally to the sustainable management of the GR.

### *5.2.4 Local dependence on the forest resources*

Traditionally, almost all inside HHs and many HHs of the adjacent villages are dependent directly or indirectly for their needs of fuelwood, building materials and some other forest products of the forest. Apparently, it seems that there is little alternative for these resources. Besides, many poor HHs are entirely or partially dependent on the forest for their livelihood. Thus this issue remains as a concern for the project

### *5.2.5 Deteriorating local law and order situation*

The law and order situation in the region as whole has deteriorated greatly and this has an influence on the people living in and around the GR. Therefore, some people particularly those who are bit powerful show disregard to law and the the local FD staff has loose control in many areas of the GR. Similarly, the other law enforcing agencies, except BDR, can do little in this regard. This is a particular concern to be considered.

### *5.2.6 Poor forest management by the FD and lack of specific GR management action plan*

As became apparent from the appraisals that the forest is 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 has been identified as a major cause for illegal use of forest. Most importantly, there is no management action plans for the management of the GR and therefore are important issue for consideration

### *5.2.7 Local poverty and unemployment*

Local poverty and unemployment have been identified as the driving force 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 the particular attention.

### *5.2.8 Presence of Rohingya refugees in and around the GR*

The role Rohingya refugee has been shown detrimental to the forest and its biodiversity. Still now, they are involved with illegal extraction of forest resources. The project needs to address this issue.

### *5.2.9 Traditional use of forest by the ethnic community*

The local ethnic community are traditionally dependent on many resources and their food habit and resource use pattern are in many cases are different from the other local people. In particular, the Tonchoinga tribe hunts on almost all type wildlife. This foos habit has probably caused to the decline to the wildlife of the area. Although, wildlife is very less available still they look for these. The project should do something in this regard.



#### *5.2.10 Involvement of local influential people in forest use*

Many local people those who are influential help in illegal tree felling in the way of negotiating with FD or other law enforcing agencies and sometimes they impose their influence to cover up the offences. They are main SH in grabbing land its conversion. The project should takes into account this issue while plan for thre management of the forest.

#### *5.2.11 Presence of sawmills and brickfield around the GR*

Brickfield use huge quantity of fuelwood that come from the GR and other adjoining forests and thus contribute to the forest degradation. Similarly, local sawmills are also involved with use of illegally felled timber and they encourage this activity. The operation of sawmills and brickfield is the violation of the forest laws. Project should address this issue.

#### *5.2.12 Role of forest villagers*

In Teknaf GR forest villagers are involved with forest land encroachment and expansion of settlements and also some of them are involved with illegal timber felling. The project should also look at the matter and the agreement with them.

#### *5.2.13 Lack of awareness among local people about biodiversity conservation*

TTThere is 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 the project.

#### *5.2.14 Extensiveness of the project site*

The Teknaf GR is extensive in its area coverage and thus has a huge population. It will be difficult establish co-management system bringing huge number of SH on board. Therefore, the project should give on this issue.

### 5.3 Challenges for the Project

The possible challenges for the project could be:

- **Stopping fuelwood, 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 stopped. However, probably, it will be a difficult job for the project to address this issue.
- **Reversing FD's production forestry policy in favour of biodiversity conservation:** FD's production forestry is century old and therefore they are used to it. This still remain lucrative as it generate huge revenue for the government. The issue of biodiversity conservation is still to override the issue of demand for timber in the country. In the back drop of this scenario it will be difficult for the project to introduce practice for the conservation of biodiversity.
- **Establishing co-management regimes for biodiversity conservation in a huge area:** Approach for resource management involving the various stakeholders is new in the country. It will be a 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.
- **Recovery of encroached land:** Past efforts in the Lawachara for recovery of encroached land were not fully successful as the encroacher managed to prepare some document which give them the right to hold the land.

## 5.4. Opportunities

- **Positive responsiveness of the local people:** The general people show interest in the project. This aptitude of local people could be utilized to ensure their participation in the project and thus will help in establishing co-management.
- **Ecotourism development:** A large number of people visit the park. If infrastructures are developed this will attract more visitors and ecotourism could be planned accordingly.
- **Buffer zone plantations:** There are huge denuded forest areas surrounding the park. This land could be brought under social afforestation schemes and could be used for sustainable resource exploitation zones. This scheme may reduce the dependency on the park's resources.
- **Scope for alternate income generation activities:** There are 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.
- **Habitat restoration and rehabilitation:** Still there are denuded areas within the park, these could be brought under plantations with indigenous and eco-friendly plant species. Besides, natural regeneration could be allowed to bring back the wilderness in the park.

## 6. SUGGESTIONS AND RECOMMENDATIONS

6.1 Teknaf Game Reserve is extensive in its area coverage, having a large population and many parts of it are not easily accessible. It seems that it will be very difficult, even may be impossible, to implement a co-management system for the management of the GR involving the local people. Therefore, for the successful implementation of co-management model, it is strongly suggested that a suitable smaller area of the GR should be considered for bringing under the pilot site. As identified, FD has loose control in the southeastern part of the forest, primarily due to prevailing poor law and order situation. Furthermore, another project is working the area with an effort to establish an Eco-park. This area could be excluded from the pilot site. It is recommended that the project should work in the Whykong Range and Shilkhali beat of the GR. A map for the suggested area for inclusion in the project is attached herewith (Fig 44).

### **Administrative**

6.2 The GR is being administered as any other non-protected forests. It is suggested that as soon as possible the GR should be handed over to the newly created Wildlife and Nature Conservation Division of the FD.

6.3 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 GR 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
- 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 for local FD
- Provision for providing incentives to local FD staff to make the job lucrative

# Suggested Pilot Area Land Use Cover Map (not to scale)

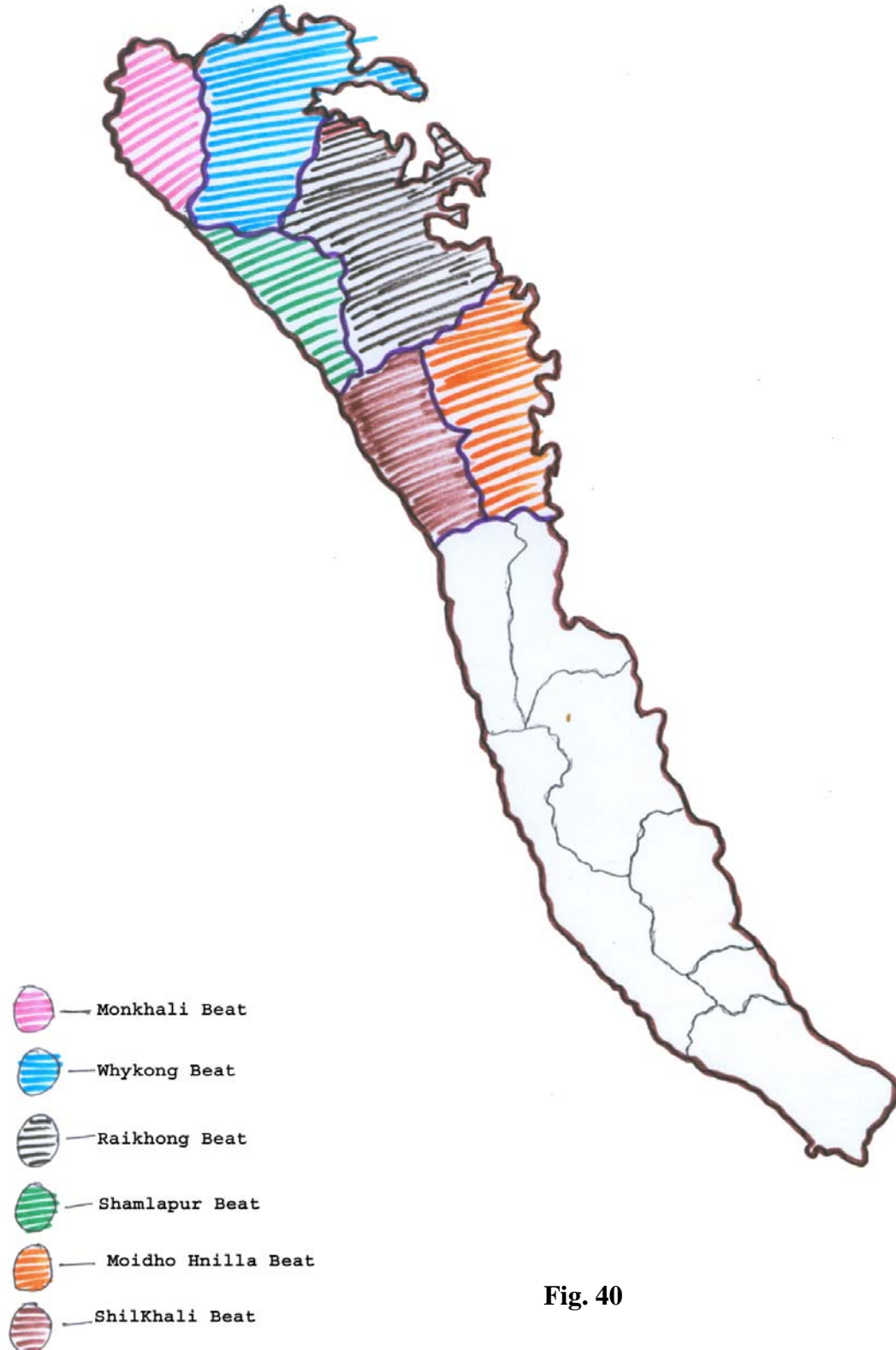


Fig. 40

- 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.

### **Scientific and Technical Management of the park**

6.4 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 habitat restoration and rehabilitation
- a plan of actions for protection and sustainable uses of forest resources and biodiversity

### **Some specific suggestions:**

6.4.1 Plantations with exotic trees must be stopped and no long term strategies should be taken for plantation of the forest, rather principle of bringing wilderness by natural regeneration process should be followed.

6.4.2 Short-rotational plantations with exotic trees should gradually be replaced with indigenous species. To this end, the plantations which have reached near maturity (around 15-20 years) may be clear felled and be planted with indigenous species with focus on fruit bearing species.

6.4.3 A rehabilitation scheme should separately be considered for the elephants, the most important component of the Teknaf GR ecosystem, To this end the following could be considered:

- re-establishment of habitat continuity between the fragmented habitats of the primates
- plantation scheme with banana, bamboo and other fodder vegetation should be taken
- Human-elephant conflict has been a issue in the area and should be addressed.

6.4.4 Considering the dependence of local poor people on the forest resources, sustainable use of some resources, like vegetables, honey, medicinal plants and other non-timber forest products may be allowed.

6.4.5 Fuelwood, 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 be allowed for exploitation on the basis of principle of sustainable use. Therefore, project should strongly consider the following:

- establishment of a buffer sustainable resource use zone around the PA with provision for fuelwood plot, woodlot and other plantations required for house building purposes
- providing resource substitution (for example, commercialization of fuel made of rice husk and others)
- promotion of fuel efficient stoves in the locality
- promotion of homestead plantations

6.5 The present rate of land encroachment is alarming and must be stopped. Strong monitoring and legal action should be taken. Effort should be taken to build community consensus on this issue.

6.6 The encroached land should be recovered and/or a trade off for social forestry may be made with a provision for biodiversity conservation

6.7 Betel leaf cultivation should be stopped within the sanctuary area. As it has emerged as a alternate source of income generation to the local people, this may be rehabilitated to

some buffer zone areas with provision for resource substitution for materials for support, shade and fencing of the betel vine yard

- 6.8 Poor resource users, particularly those who are dependent on the forest for their livelihood, should be identified and brought under AIG program with a trade off for 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.
- 6.9 Approach should be taken to bring the local elites on board with the concept of forest protection. Local public representative should be consulted in undertaking various activities.
- 6.10 The project should initiate a strong dialogue sawmill and furniture shop owners to comply with forest laws, in case of failure tougher actions should be taken against them with strong support from FD's higher authority
- 6.11 Awareness activity should be done on a priority basis in the area to make the people understand about value of biodiversity conservation and how the people could be benefited out of this project
- 6.12 As there is a lot allegation about the local police that they help the illegal resource users, illegal tree feller in particular, strong dialogue should be initiated with them involving the higher authority. Similar, approach may be taken in case of other law enforcement authority, particularly with BDR, to ensure the effective involvement of law enforcement agencies at the local level.
- 6.13 Project should also make provisions for generating scientific and social knowledgebase on the GR. On an immediate basis a comprehensive faunal and floral inventories should be made. Investigations in to the threatened categories of plants should be made on an priority basis and a management scheme for their protection and rehabilitation should be developed.
- 6.14 Project should make effort to negotiate with local development partners for extending social welfare services to the area.



- 6.15 Forest villager's agreement should be reviewed and renegotiated with valid forest villagers. The encroachers should be rehabilitated outside of the sanctuary area with proper support for AIG
- 6.16 Rohingya refugees have been shown to cause harm to the GR, in the way of resource exploitation, establishing settlements etc. A strong dialogue with appropriate authority should be made so that they could be transferred to the other areas away from the GR.
- 6.17 Traditionally, the tribal community, Choncha (Chakma) in particular, hunts on various types of wild animals and contributed to the decline in the resources in the GR. Strong awareness program should be developed targeting the tribal community. Simultaneously, resource substitution for the wildlife should be done by promoting livestock and poultry rearing activities.

## Annexure .1 Pictorial Description: Teknaf GR



A tribal women is carrying fuelwood from Teknaf GR : Samlapur Beat



Stacked fuelwood for the coming rainy season in a HH in Jahajpura



Transect walk by the field team inside the deep forest of Samlapur



Building cattle shed: Initial step in land encroachment process.



FGD with forest villagers in Samlapur beat office



An illegally felled tree in Samlapur beat



A family engaged in fuelwood extraction



Fuelwood marketing channel: a middleman carrying fuelwood to a trader



Monkhali canal: a route for transportation of illegally felled trees



Loading of fuelwood on truck: destination urban areas



A denuded hill: once existed deep forest here



Stacking of fuelwood for bulk sale.



A betel leaf *boros* inside Teknaf GR



A local centre for betel leaf trading at Jahazpura



A view of jhum cultivation inside the Teknaf GR



Hill forest is cleared for Jhum cultivation



Stamp has been felled by the shifting cultivator: impact of Jhum cultivation.



Clearing of land for FD's plantation site



Fuelwood is carried to the local market as headload



A usual view of carrying fuelwood to local market



A group of illegal logger with their harvest at Mathabanga.



A local people carrying a log on his shoulder to his home



A monitor lizard in Teknaf GR



A bed prepared for paddy cultivation inside Teknaf GR



A group of fuelwood collector waiting for a vehicle to come to carry their collection



An illegal logger with his harvest from the forest



An illegally felled tree waiting to be collected sometime next day



A very old garjan tree illegally felled by loggers employed by an influential person



An entire family engaged in illegal timber felling

## **Annexure-2 Checklist of questions of RRA for FGD, KI and HHs interview**

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

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

1. What are the settlements/villages from where the people come to the forest and collect resources? Please indicate its location on the map.
2. What are the different categories of people who collect different resources from the forest?
3. At what extent the local people depend on the resources they collect from the forest for their livelihood, please specify for each category of resource users group?
4. What are the local organizations/institutions which are involved with the development /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-3 PRA issues

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

### Understanding the forest make up and dynamics

**Transect map :** Necessary for understanding the present forest 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 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
- 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

**Rohinga issue (Teknaf):**

- Distribution of Rohingya settlement/camps in and around the forest
- Settlementalization or process of establishing settlement (past and present)
- Present economic activities
- dependence on the forest resources and its impact on the forest
- relationship with the local people or agencies
- internal governance system
- conflict with Fd or other agencies or other people with use of the forest
- needs and expectation

**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 thre use 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

**Betel leaf cultivation**

- distribution of betel vine yards within and around the forest and approximation of its number
- historical perspective of flourishing the activity in the area
- who cultivate (local people, poor/rich people, influential etc.)
- ownership of land (FD/private/khas etc./own)
- dependence on the activity ( necessary for livelihood, supplement income, entrepreneurship etc.)



- ❑ Impact on the forest resources and its sustainability
- ❑ Development of
- ❑ Conflict with FD
- ❑ Marketing chains and mechanism

### **Jhum (shifting) cultivation**

- ❑ Identify the areas where the activity dominate within and around the forest and indicate its extent
- ❑ historical perspective and trend of the activity
- ❑ who do practice and where do they come from (tribe of ethnic people, poor or rich, on whom land (FD/khas/privately owned
- ❑ dependence on the activity ( necessary for livelihood, supplement income, entrepreneurship etc.)
- ❑ Impact on the forest resources and its sustainability
- ❑ Conflict with FD
- ❑ Trend in changes in the activity

### **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 (Chunati/Teknaf)**

- ❑ 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 (Chunati/Teknaf)**

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

**Livestock grazing (Teknaf)**

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

**Information on clear felling (Satchari):**

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

**FGD with Tea Garden people (Lawachara (3), Satchari (2) and Rema (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