

Chapter - VIII

SOCIOECONOMIC CONDITION OF THE NEARBY VILLAGERS AND HUMAN PRESSURE ON THE SANCTUARY

8.1. Introduction

Forests are very important natural resource for rural livelihood and provide a wide range of products and services (Jaiswal and Bhattacharya, 2013). It supplies fuels, fodder, medicine, construction materials and other subsistence required to local communities, especially in developing countries (Bahuguna, 2000). Millions of people are living inside or in the periphery of forestland depending on the resources for their survival. It has been observed that there is no official census data for the forest dependent population in the country and the estimated figures vary from 275 million (World Bank, 2006) to 350-400 Million (MoEF, 2009).

In India, about 1,96,000 villages are in the forests or on the forests fringes and they depend on forest for their sustenance and livelihood (Senthilkumar, 2015). Initially, forest and forest products remained chief source of their livelihood, but at later stages of their development they switched over to settled agriculture and to other manual jobs. The decrease in the land-man ratio has brought pressure on forestland because of agricultural, industrial and settlement needs. Thus, because of these changes of land-cover and land-use are occurring across many protected forest areas (Gadgil and Guha, 1992 and Kothari *et al.*, 1995).

Different human activities such as livestock grazing, agriculture, hunting, fishing, collection of timber, fuel wood and non-timber forest products (NTFPs) have altered land cover and introduced new land uses in many Indian protected areas (Somanathan and Borges, 2000 and Rahmani, 2003). Human population growth and development in Northeast India have fragmented and reduced wildlife habitat causing habitat fragmentation which has resulted in human-wildlife conflicts (Choudhury, 2004). Karanth (2006) have also reported that human settlement and their related services have result in habitat fragmentation. Encroachment in the forest lands by local people has resulted in shrinkage of wildlife habitats. Collection of fuel wood, grazing of cattle, and fodder removal are also an important cause of forest degradation in some protected areas.

In the last few decades, rapid growth of population leads to depletion of forest resources which are overexploited or being cleared for resettlement and agriculture expansion (Kaimowitz & Angelsen, 2003 and Geist & Lambin, 2002). This type of exploitation and clearing of forest have contributed to climate change, loss of biodiversity, depletion of various forest resources, etc. and it adversely impacted the livelihood of the forest dependent communities (FAO, 2006). As per the reports of the Indian State of the Forest Report (ISFR) 2011, forest cover has declined by 367 sq. km compared to the forest cover in the preceding ISFR in 2009.

Socioeconomic condition of the people living inside and around the protected areas largely determines the human pressure on forests relating to or involving a combination of social and economic factors. The socioeconomic survey is assesses to know the prevailing socioeconomic conditions as well as local people's knowledge of biodiversity and its conservation (Hunter & Brehm, 2003 and Sahoo & Davidar, 2013).

The survey tools for socioeconomic are designed to collect information by households and villages. These results are very helpful in providing an over view of the socioeconomic status and the dependency of the people on the forest.

The objectives of this investigation are to generate baseline data on the socioeconomic and livelihood status of communities living adjacent to the Sonai-Rupai Wildlife Sanctuary and their impact on the habitat and biodiversity loss in the sanctuary. The study was carried out amongst different communities of Nineteen (19) villages using both quantitative and qualitative research approaches.

8.2. Need of Socioeconomic Study

The conservation of wildlife depends on an understanding of how human populations interact with wildlife and their habitat. The understanding and knowledge of local people's perceptions and attitudes towards a protected area and their associated wildlife is important for the implementation of conservation policies (Holmes, 2003). The socioeconomic study will help the policy-makers in the formulation and execution of conservation related development programmes (Mahanta and Das, 2013). The socioeconomics study also involves how people exploit the natural resources of a given area and the conflicts they can have with wildlife, and their attitudes towards wildlife and its conservation. The data collected will help to determine the dependence of villagers on the forests. In the study area, very little information is available regarding the socioeconomic status of the people of the area and its relation to forest loss, habitat fragmentation and human-wildlife (elephant) conflicts. The absence of such a valuable baseline data has created a knowledge gap in decision making for proper management of the sanctuary. The study will not only be helpful as a planning tool but would also

play a role as a guiding document for the decision makers who intend to contribute for uplifting the living standards of the inhabitants of target area and for assuring the sustainable use of natural resources.

8.3. Methodology

The socioeconomic survey in the villages in and around Sonai-Rupai Wildlife Sanctuary was carried out during April, 2014 to May 2016. Relevant data were collected through questionnaires, interactive participatory approach and general observation technique. The methodology of a mixed-method was employed for primary data collection from various key informants using questionnaires, interviews, discussion with focus groups and other participatory approaches. Secondary data were collected from the office records of Forest Beat office, Sonai-Rupai Wildlife Range Office, Gram Panchayat Offices as well as from the available literature.

Access to the sanctuary was obtained with due permission from the Sanctuary Authority under Forest Department, Govt. of Assam, and field visit and survey was carried out under specific conditions laid down by the concern authority (i.e., restricted timing or availability of guides of the forest department and permission from the concern authority). Another major problem which was faced during the survey was due to heavy rains. During the period of heavy rains, it was difficult to cross the flowing rivers and streams.

8.3.1. Sampling Design and Data Collection

The method of random sampling was used for the collection of primary data through questionnaire survey. The questionnaire survey has been broadly accepted for generating data on collection and consumption of fuel-wood and other non-timber forest products. The questionnaire contained a set of questions organized in a systematic way for the purpose of eliciting information from the respondents. In preparing the questionnaire, it was ensure that each question is simple and phrased in a manner that would imply the same meaning to all that are to be interviewed. Personal interviews were conducted with the knowledgeable persons. The importance of qualitative approaches in understanding social realities has been recognized by many social scientists (Odimegwu, 2000) and focus Group Discussions (FGD) are commonly used qualitative approach of data collection

(a) Collection of the secondary data

For the collection of secondary data various reports, booklets, district profiles and web pages were reviewed to understand the background of the issues of socioeconomic condition of the people in and around the sanctuary. These materials were analyzed to draw national and regional context of the socioeconomic conditions. Knowledge gathered from literature review where used in developing questionnaire for primary data collections. Secondary data were collected from Forest Department, Circle Office and Panchayat Office.

(b) Primary data collection

Nineteen (19) villages were selected from the study area for the socioeconomic survey of which eleven (11) villages are from encroached villages in the Sonai-Rupai

Wildlife Sanctuary and eight (08) villages are from fringe villages (encroached villages in Charduwar Reserve Forest) surrounding the Sonai-Rupai Wildlife Sanctuary. Households from each village were selected randomly for the purpose of the questionnaire based survey. Head of each household was interviewed for filling up the questionnaire (Appendix-III). The questionnaires were designed to obtain profiles of the household and family members indicating number of family members, age, sex, occupation, income, education, living standard and family land holding. A questionnaire was also developed covering the information of main components such as social services, facilities situation, existence of infrastructure, and potentials of natural resources. General information about the villages like village name, number of household, total population, male and female, status of migration in the village were included in Questionnaire. *Plate 8.1* shows some of the photographs taken during the field survey.



(a) Milanpur



(b) Golai



(c) Dayalpur



(d) Gujunpuri

Plate 8.1: Photograph of field Survey

8.4. Results and Discussion

Forests play an important role in the livelihoods of the local people residing near the sanctuary. Local people depend on forests resources for various products such as fuel wood, construction materials, medicine, and food. In the study area different human practices have emerged as an important factor for the destruction of natural habitat of the sanctuary. The survey results of socioeconomic parameters such as respondents profile, household size, occupation, annual income, fuel-wood, illegal logging and use of forest resources are discussed below.

8.4.1. Respondents Profile

Data relating to the respondents of different villages are presented in *Table 8.1*. The pattern of age group is an important attributes of population composition and age statistics form an important component of population analysis. The respondents which are generally head of the family are grouped into three different age-groups - 25-35 years, 36-45 years and above 46 years. It has been observed that the age-group of the head of the family vary from village to village. Most of the head of the families in these seven villages – Amlaiguri, Simuluguri, Gujunpuri, Bengnaguri, Bwigribari, Oubari and Rupanjali are comparatively young (age-group of 25-35 years). Percentage of head of the family belonging to age-group of 36-45 years are observed to be comparatively more compared to other two age-groups in villages – Dayalpur, Jiabari, Deepanjali-6, Khirsiguri, Milanpur, Alubari and Ramthpur. However, more elderly head of the families were observed in Golai village. Male-female classification of the head of the families indicates male dominance over the social structure of the communities and over the household and most of the households in all the villages are managed by men.

Table 8.1: Respondents age groups

Sl No.	Village	Age Group (%)		
		25-35(Years)	36-45(Years)	>46(Years)
1	Golai	16.66	38.88	44.44
2	Dayalpur	25	50	25
3	Nagaon	38.09	40.48	21.43
4	Jiabari	21.05	52.63	26.32
5	Amlaiguri	53.12	25	21.88
6	Simuluguri	50	33.33	16.67
7	Gujunpuri	44.45	33.33	22.22
8	Deepanjali-6	25	58.33	16.67
9	Khirsiguri	20	53.33	26.67
10	Bengnaguri	50	33.33	16.67
11	Bwigribari	57.14	42.86	-
12	Milanpur	16	52	32
13	Azarbari	20	40	35
14	Oubari	48	35	35
15	Rupanjali	40	34.29	37.14
16	Ramnathpur No.1	32	40	33.33
17	Sonapur	24	40	30
18	Alubari	28	46.67	30
19	Ramnathpur	12	62.5	25

8.4.2. Demographic Structure

a) Population

During field visit it was observed that the household in the villages were very scattered. The number of households, family size and population belonging to different villages are presented in **Table 8.2**. From the survey it was found that the highest number of households in encroached village was recorded in Jiabari village having a total population of 850 individuals while the lowest population of 27 individuals was recorded in Bwigribari villages. In fringe village highest number of population is observed in Oubari with a total population of 1200 individuals. The people mainly belong to Bodo, Adibasi Tribes, Nepali and Assamese communities. However, Bodo and Adibasi are the dominant communities in all the encroached villages.

Table 8.2: Village wise Households, Family Size and Population

Sl. No	Village Name	Village Type	No of Household	Family size			Total Population	Dominant Community
				Average	Maximum	Minimum		
1	Golai	Encroached	30	5	7	2	220	Assamese, Bodo
2	Dayalpur	Encroached	27	6	10	2	135	Adibasi, Bodo
3	Nagaon	Encroached	70	6	8	3	400	Adibasi
4	Jiabari	Encroached	95	6	8	3	850	Adibasi, Bodo
5	Amlaiguri	Encroached	52	5	8	2	350	Bodo
6	Simuluguri	Encroached	20	5	7	2	125	Bodo
7	Gujunpuri	Encroached	14	4	7	3	65	Bodo
8	Deepanjali-6	Encroached	19	5	8	3	120	Adibasi, Bodo
9	Khirsiguri	Encroached	25	5	6	3	165	Bodo
10	Bengnaguri	Encroached	10	7	9	4	60	Bodo
11	Bwigribari	Encroached	7	4	5	3	27	Bodo
12	Milanpur	Fringe	75	5	7	3	400	Adibasi, Nepali, Assamese
13	Azarbari	Fringe	52	4	6	2	320	bodo
14	Oubari	Fringe	151	6	8	3	1200	Bodo
15	Rupanjali	Fringe	122	5	7	4	750	Bodo
16	Ramnathpur No.1	Fringe	100	7	9	3	650	Adibasi, Nepali, Assamese
17	Sonapur	Fringe	60	5	7	2	320	Bodo
18	Alubari	Fringe	92	6	8	3	600	Bodo
19	Ramnathpur	Fringe	20	6	8	4	135	Adibasi

The maximum number of family member has been found in the village Dayalpur with 10 family members, whereas the minimum family member consists two people, which has been seen in Golai, Dayalpur, Amlaiguri, Simuluguri, Azarbari and Sonapur respectively. It was found that people who stayed longer were highly dependent on forests compared to their counterpart. Since forest activities are labour intensive, larger families have adequate manpower to allocate across gathering activities. Similar findings were observed by Pattanayak *et al.*, (2003) in Siberut Forests, Nepal.

Household size is positively associated with forest dependency. In the surveyed villages, an average of 5 people makes a family. Gunatilake, 1998 and Mamo *et al.*, 2007 have also reported that larger families have higher subsistence needs which necessitate them to depend more on forest resources.

From the survey it has been found that that the majority of the population were migrants from different part of the state and have encroached the forest land. Most of the migrants came to the area for livelihood and other source of employment opportunities, and many continue to do so. The residing time of people living in the village is presented in **Table 8.3**. It has been found that people have mainly migrated during 1990's for the search of new land for their settlement. The survey data reveals that 51.01% of the total population are residing for more than 15 years with 37.21 % residing for last 35 years. People residing in Gujunpuri and Ramnathpur are residing for more than 35 years are mainly from Adibasi tribes.

Table 8.3: Residing period of People

Sl. No	Village Name	Residing Time(%)		
		5-15 yrs	15-25yrs	>35 yrs
1	Golai	22.22	33.33	44.44
2	Dayalpur	6.25	31.25	62.50
3	Nagaon	0.00	23.81	76.19
4	Jiabari	17.54	31.58	50.88
5	Amlaiguri	9.38	34.38	56.25
6	Simuluguri	16.67	25.00	58.33
7	Gujunpuri	0.00	0.00	100.00
8	Deepanjali-6	0.00	33.33	66.67
9	Khirsiguri	13.33	60.00	26.67
10	Bengnaguri	0.00	100.00	0.00
11	Bwigribari	0.00	100.00	0.00
12	Milanpur	20.00	80.00	0.00
13	Azarbari	15.00	60.00	25.00
14	Oubari	20.00	67.50	12.50
15	Rupanjali	0.00	71.43	28.57
16	Ramnathpur No.1	16.67	46.67	36.67
17	Sonapur	25.00	50.00	0.00
18	Alubari	16.67	46.67	36.67
19	Ramnathpur	0.00	0.00	100.00

The migration in the study area is mainly because of more employment opportunity, availability of vast fertile lands along the riverine tracts in Assam, the state has seen a heavy influx of immigrants, who have increasingly turned to the remnant natural habitats for their cultivation purposes as well as to meet their other daily resource needs (Sharma *et al.*, 2012). Increased population in the adjoining area of a forest is also a serious threat to the integrity of that forest which is occurring due to mass immigration. Population explosion is known to be one of the important causes of forest degradation and deforestation (Flint, 1994; Ali, 2003 and Rasul *et al.*, 2004).

The study and monitoring of deforestation in using ground based methods has become a difficult task due to high insurgency in Assam, especially in Sonitpur district (Srivastava *et al.*, 2002). Khuswaha (2004) has also reported that the consequences of this insurgency in state has resulted in a large-scale deforestation and encroachment in forested tracts encompassing reserve forests of Sonai–Rupai and its nearby forest reserves (Charduwar Reserve Forest). In the present study because of this many unauthorized villages started to grow inside the protected area which have been described as ‘encroached villages’. The people living in these villages are not native to this area. Large population is migrated from different part of the state and cleared up the jungle in order to reclaim land for cultivation. Most of the respondent mentioned a land dealer who has arranged land for them. The land dealer told them that Sonitpur was a proposed part of the tribal belt and as a result tribal have a right to this land. Many respondents mentioned that they have purchased 1.5-3.0 hectores of forestland for Rs. 1600-3500 from the land dealer. Many settlers also told that the land dealer have prevented their eviction from the forest land and have also safeguarded them.

Encroachment of forestland by the immigrant is a serious threat to forests which has resulted in habitat loss in the study area. This has not only caused loss of forest area but has also created a tool for perpetual degradation of forest resources. Srivastava *et al.*, (2002) have also reported that the decline of forest cover in Sonitpur district was more between the years 1999-2001 and the overall rate of forest decline between 1994-2001 was estimated to be 28.05%.

8.4.3. Housing Pattern/Living Condition

(a) Housing Conditions

The people living in the study area are economically very weak. The living conditions of the people are very low and it has been found that most of the people are living in *Kachha* houses made of mud, bamboo & wood and *Semi-Pakka* houses made of half concrete wall. The type of houses in different villages is presented in **Table 8.4**. The study shows that about 83.8 % of the people are living in *Kachha* houses. In villages Amlaiguri, Khirsiguri, Benganaguri, Bwigribari and Ramnathpur 100% of population are living in *Kachha* houses; where as in Jiabari, Golai, Azarbari, Oubari, Sonapur and Alubari an average of 30% population are living in Semi-pakka houses. The Villagers are mainly dependent on natural resources for construction of their houses and fences. The houses are mainly made up of wood and “*khair*” which are mainly collected from the forest. Various wood species are available in the forests, which are used as house building materials.

Table 8.4: Type of houses in different villages

Sl. No	Village Name	Type of house(%)	
		kacha	Semi-pakka
1	Golai	66.67	33.33
2	Dayalpur	87.50	12.50
3	Nagaon	90.48	9.52
4	Jiabari	64.91	35.09
5	Amlaiguri	100.00	0.00
6	Simuluguri	83.33	16.67
7	Gujunpuri	100.00	0.00
8	Deepanjali-6	83.33	16.67
9	Khirsiguri	100.00	0.00
10	Bengnaguri	100.00	0.00
11	Bwigribari	100.00	0.00
12	Milanpur	80.00	20.00
13	Azarbari	60.00	40.00
14	Oubari	60.00	40.00
15	Rupanjali	74.29	25.71
16	Ramnathpur No.1	93.33	6.67
17	Sonapur	65.00	35.00
18	Alubari	83.33	33.33
19	Ramnathpur	100.00	0.00

b) Sanitation Facilities

The study surveyed about the type and use of toilet facilities in the study area and has been shown in **Table 8.5**. The information of sanitation facilities is very important to gain knowledge about the living condition and hygienic condition of the villagers. The result shows that the majority of respondent have Temporary toilet even with temporary pit. The conditions of the toilet in most of the villages were not good. During the survey it was found that only 53% of people have temporary toilet while only 37 % are having semi-pakka toilet facilities. About 10 % of total surveyed villagers either have open pit toilet or they even go for open defecation. The survey also found

that 71% of the total household surveyed in encroached villages are using temporary toilet.

Table 8.5: Type of Toilet Facilities (%)

Sl No	Village Name	Semi Pakka	Temporally
1	Golai	44	56
2	Dayalpur	25	75
3	Nagaon	29	71
4	Jiabari	14	65
5	Amlaiguri	19	81
6	Simuluguri	25	58
7	Gujunpuri	22	56
8	Deepanjali-6	0	83
9	Khirsiguri	0	100
10	Bengnaguri	0	67
11	Bwigribari	14	71
12	Milanpur	72	28
13	Azarbari	70	30
14	Oubari	63	23
15	Rupanjali	49	31
16	Ramnathpur No.1	40	33
17	Sonapur	65	35
18	Alubari	73	20
19	Ramnathpur	75	25

8.4.4. Education, Employment and Income Level

a) Existing schools in the Village

Education is one of the important key factors that play an important role in assessing the socioeconomic condition of any area and is more contributing factor than income for uplifting the living standards in society. *Table 8.6* shows School in the Villages. In the study area it has been seen that most of the villages do not have a proper school. Some of the villages have nursery schools (Lower Primary) and schools till 8th grade, while some with lower population (e.g. less than 15 households) do not have any

schools. It has been found that children from these villages have the option of walking to schools in nearby villages, which is far distance away. The level of education in surveyed villages around the sanctuary is reputedly low. The schools are poorly equipped with few teachers. Children hardly attain the level of secondary education which is one of the prime reasons which makes it difficult to bring about changes in people's attitudes and behaviour towards sustainable use of natural resources.

Table 8.6: School in different village

Sl. No.	Village Name	School	
		LP School	ME School
1	Golai	LP School(Bodo Medium)	ME School (Bodo Medium)
2	Dayalpur	-	-
3	Nagaon	LP School()	-
4	Jiabari	-	-
5	Amlaiguri	Primary School (Bodo Medium)	-
6	Simuluguri	-	-
7	Gujunpuri	-	-
8	Deepanjali-6	Non Govt School, LP School	ME School (Bodo Medium)
9	Khirsiguri	-	-
10	Bengnaguri	-	-
11	Bwigribari	-	-
12	Milanpur	LP School(Bodo Medium)	-
13	Azarbari	-	-
14	Oubari	LP School(Bodo Medium)	ME School (Bodo Medium)
15	Rupanjali	LP School(Bodo Medium)	-
16	Ramnathpur No.1	-	-
17	Sonapur	-	-
18	Alubari	-	ME School (Bodo Medium)
19	Ramnathpur	-	-

b)Literacy

The literacy rate in the study area is very low. It has been seen that 42.5 % respondent are illiterate and about 34.2 % of the respondent have attendant primary education and only 7.0 % has higher secondary and above education. The highest 75% of illiterate population were found in Dayalpur and Ramnathpur followed by 70% in Azarbari, and Ramnathpur No. 1. The education qualification of the respondent is shown in *Table 8.7*.

Table 8.7: Education Qualification of the Respondent (%)

Sl No.	Village Name	Illiterate	I-V	V-IX	X-XII
1	Golai	16.67	16.67	38.88	27.78
2	Dayalpur	75	25	-	-
3	Nagaon	16.67	30.95	33.33	19.05
4	Jiabari	64.91	21.05	10.53	3.51
5	Amlaiguri	37.5	28.12	15.63	18.75
6	Simuluguri	25	16.67	25	33.33
7	Gujunpuri	22.22	77.78	-	-
8	Deepanjali-6	16.67	58.33	25	-
9	Khirsiguri	53.33	26.67	20	-
10	Bengnaguri	33.33	66.67	-	-
11	Bwigribari	42.86	28.57	28.57	-
12	Milanpur	40	44	16	-
13	Azarbari	70	20	10	-
14	Oubari	35	50	15	-
15	Rupanjali	34.29	17.14	37.14	11.43
16	Ramnathpur No.1	70	30	-	-
17	Sonapur	40	40	20	-
18	Alubari	40	26.67	13.33	50
19	Ramnathpur	75	25	-	-

It is well established that higher education attainment is associated with less dependency on forest resources because education offers other alternative livelihood opportunities which may generate significant returns compared to forest extraction

activities. Similar findings were observed by Panta *et al.*, (2009) while studying human pressure in Terai of Nepal as well as by Fonta and Ayuk (2013) who have studied human pressure in Forests of South eastern Nigeria.

c) Source of Income and Average Monthly income

The average annual income varies among the villages, depending on the main and supplementary occupation and land holding. **Table 8.8** shows the sources of income in the villages.

Table 8.8: Source of Income (%)

Sl No.	Village Name	SOURCE OF INCOME		
		Agriculture	Labour	Buisness
1	Golai	55.56	16.67	27.78
2	Dayalpur	62.50	25.00	12.50
3	Nagaon	69.05	14.29	16.67
4	Jiabari	80.70	12.28	7.02
5	Amlaiguri	71.88	21.88	6.25
6	Simuluguri	66.67	8.33	25.00
7	Gujunpuri	77.78	22.22	0.00
8	Deepanjali-6	50.00	33.33	16.67
9	Khirsiguri	93.33	6.67	-
10	Bengnaguri	100.00	-	-
11	Bwigribari	85.71	14.29	-
12	Milanpur	48.00	20.00	32.00
13	Azarbari	75.00	10.00	15.00
14	Oubari	70.00	12.50	17.50
15	Rupanjali	65.71	14.29	20.00
16	Ramnathpur No.1	83.33	16.67	-
17	Sonapur	65.00	15.00	20.00
18	Alubari	73.33	6.67	20.00
19	Ramnathpur	62.50	37.50	-

According to the field survey, the work force in the village areas is distributed into Agriculture, Cattle rearing, Business and Labour. Business in the study area includes small shops of grocery and cloth. The main occupation in the study area has been identified as rain-fed agriculture. In the study area it has been found that no cash crops are present. The crops cultivated are mainly paddy and seasonal vegetables. Because of this the income from agriculture has continued to be at subsistence levels or below it. An average of 71.37 % of the total surveyed household is earning their livelihood through agriculture. In Bengnaguri 100% of population is dependent on agriculture followed by Khirsibari and Ramnathpur No. 1 were 93% and 83.33% of population is dependent on agriculture. Only a small population is earning their livelihood through business. The survey data revealed that the respondents who are employed showed less dependency on forest products because employment opportunity may offer better income generating options compared to services derived from the forest.

The average monthly income in all the surveyed villages is shown in **Table 8.9**. The surveyed data shows that people are living in a poor condition of life. An average 46 % of total population surveyed are earning their income less than Rs 3000 per month and 40 % are earning an average of Rs. 6000 per month. Only 14 % of population are earning more than Rs.6000 to Rs 10,000 per month.

Table 8.9: Monthly Average Income

Sl No.	Village Name	Monthly Income (in %)		
		Less than Rs. 3000	Rs. 3000-6000	More than Rs. 6000
1	Golai	16.67	55.56	27.78
2	Dayalpur	68.75	18.75	12.50
3	Nagaon	69.05	14.29	16.67
4	Jiabari	33.33	50.88	15.79
5	Amlaiguri	50.00	43.75	6.25
6	Simuluguri	33.33	58.33	8.33
7	Gujunpuri	33.33	66.67	0.00
8	Deepanjali-6	50.00	33.33	16.67
9	Khirsiguri	40.00	46.67	13.33
10	Bengnaguri	66.67	33.33	0.00
11	Bwigribari	71.43	28.57	0.00
12	Milanpur	28.00	48.00	24.00
13	Azarbari	30.00	60.00	10.00
14	Oubari	17.50	60.00	22.50
15	Rupanjali	17.14	42.86	40.00
16	Ramnathpur No.1	60.00	26.67	13.33
17	Sonapur	60.00	20.00	10.00
18	Alubari	36.67	40.00	23.33
19	Ramnathpur	87.50	12.50	0.00

d) Livestock

Livestock is an integral part of the socioeconomic activities for the people of the rural area. Livestock play a key role in mitigating the effects of poverty by providing meat and milk for daily use. These livestock also act as source of income in the rural area. Table 8.10 shows the livestock in the villages. An average of total household surveyed, 63 % household has hen and duck and 65% and 46 % of household have cow and goat population respectively. And about 45% of populations are having pig. Since the livestock are an important factor that impact the forest and reduce the carrying capacity, the numbers of livestock owned by households were noted and whether stall fed or free ranging were also recorded.

Table 8.10: Livestock in the Villages (in %)

Sl No.	Village Name	Farm Animal			
		Cow	Goat	Hen/Duck	Pig
1	Golai	55.56	50.00	72.22	33.33
2	Dayalpur	68.75	18.75	68.75	31.25
3	Nagaon	64.29	73.81	66.67	40.48
4	Jiabari	56.14	61.40	75.44	59.65
5	Amlaiguri	75.00	81.25	56.25	68.75
6	Simuluguri	75.00	50.00	66.67	66.67
7	Gujunpuri	66.67	33.33	77.78	44.44
8	Deepanjali-6	66.67	41.67	75.00	16.67
9	Khirsiguri	86.67	73.33	60.00	20.00
10	Bengnaguri	100.00	66.67	100.00	83.33
11	Bwigribari	57.14	28.57	100.00	28.57
12	Milanpur	48.00	24.00	20.00	76.00
13	Azarbari	70.00	30.00	35.00	70.00
14	Oubari	62.50	37.50	62.50	65.00
15	Rupanjali	60.00	51.43	57.14	31.43
16	Ramnathpur No.1	73.33	36.67	53.33	16.67
17	Sonapur	70.00	50.00	65.00	55.00
18	Alubari	33.33	43.33	40.00	43.33
19	Ramnathpur	37.50	25.00	50.00	12.50

8.4.5 Health and Sanitation

a) Drinking water facility

In the surveyed villages there is no problem of drinking water in majority of villages. Most of the villagers in the study area uses well and hand Pump as a source of drinking water. The other options like natural source such as river are also available in the surveyed villages which are also used by some of the household. The source of drinking water is shown in *Table 8.11*. During the survey it was found that 45.02 % of total population uses hand pump and 41.08 % of the population is using well water for drinking purpose. During winter season there is scarcity of water in villages such as

Khirsiguri, Bwigribari, Simuluguri, Azarbari, Rupanjali and Alubari because these villages are highly dependent on the river water.

Table 8.11: Source of Drinking Water

Sl. No	Village Name	Water		
		Well	Hand Pump	River
1	Golai	16.67	83.33	-
2	Dayalpur	31.25	68.75	-
3	Nagaon	30.95	57.14	11.90
4	Jiabari	14.04	85.96	0.00
5	Amlaiguri	31.25	68.75	0.00
6	Simuluguri	25.00	58.33	16.67
7	Gujunpuri	22.22	77.78	0.00
8	Deepanjali-6	66.67	33.33	0.00
9	Khirsiguri	13.33	0.00	86.67
10	Bengnaguri	33.33	66.67	0.00
11	Bwigribari	42.86	0.00	57.14
12	Milanpur	60.00	40.00	0.00
13	Azarbari	50.00	30.00	20.00
14	Oubari	45.00	40.00	15.00
15	Rupanjali	57.14	22.86	20.00
16	Ramnathpur No.1	60.00	26.67	13.33
17	Sonapur	65.00	35.00	-
18	Alubari	53.33	26.67	20.00
19	Ramnathpur	62.50	37.50	-

b) Health care Centre

From the present field survey it was found that there are no Primary Health Care Centres or any hospital in all these villages. In case of health emergencies, the patients have to be taken to the nearby revenue villages i.e either they have to go to Rangapara or Garubandha (Missamari).

8.4.6. Transport Facilities

The field survey found that there is lack of proper infrastructure in the villages. The transport facilities in these villages are very poor. The conditions of roads are also not good. During monsoon some villages are completely cut off from each other. Most of the road is kacha road.

8.4.7. Dependence/Extraction of Forest Resources

To understand and estimate the dependence of the local people on forest resources and their requirement of fuel-wood and fodder, each of the household were questioned about the source of domestic energy, and if fuel-wood collected from the forest. Some population even collect fruits, edible products and medicinal plant from the sanctuary. People are using mainly natural resources such as timber (wood) from the forest for the construction of their houses and fences. Though there is availability of brick and cement and other materials in the nearby market they can't afford it because of their low income status.

a) Source of Fuel wood

The dependency on forest products for energy needs is very important in the forest villages. Table 8.12 shows source of fuel used in cooking. In Gujunpuri, Khirsiguri, Bengnaguri and Ramnathpur 100 % of population are using wood as fuel for cooking. The survey result shows that the villagers depend highly on wood for the fuel wood requirement. It has been observed that 78.9 % of total population surveyed uses wood as source of energy for cooking. It has also seen about 80% encroached villages are dependent on wood for their cooking purposes. The high percentage clearly

indicates their dependency on the forest resources. This is because the rural households are resource constrained and non-availability of other cheaper alternatives. This situation creates an additional pressure on the forest of the sanctuary. The villagers are allowed to collect twigs and branches from the forest floor and also some extent to extract dry branches of fuel wood and carry on head loads for domestic consumption by permission of the Forest Department. But as they collect in excess in a destructive way and also cut the green and major branches of the trees is causing negative impact on the sanctuary. Almost all the villagers of the study area have to pay daily visits to the forest in order to collect firewood. Some part of the population depends on collection of firewood as an occupation. They collect and sell the collected wood at the local markets and earn money for their survival.

Table 8.12: Source of fuel for cooking

SI No.	Village Name	Source of Fuel (in %)	
		wood	kerosene/LPG
1	Golai	88.89	11.11
2	Dayalpur	81.25	18.75
3	Nagaon	85.71	14.29
4	Jiabari	84.21	15.79
5	Amlaiguri	87.50	12.50
6	Simuluguri	83.33	16.67
7	Gujunpuri	100.00	0.00
8	Deepanjali-6	75.00	25.00
9	Khirsiguri	100.00	0.00
10	Bengnaguri	83.33	16.67
11	Bwigribari	100.00	-
12	Milanpur	60.00	40.00
13	Azarbari	65.00	35.00
14	Oubari	57.50	42.50
15	Rupanjali	57.14	42.86
16	Ramnathpur No.1	60.00	40.00
17	Sonapur	60.00	40.00
18	Alubari	70.00	30.00
19	Ramnathpur	100.00	-

Because of degradation of forests in the fringes, it is observed that the people have to go deeper and deeper, year by year for fetching firewood and other forest produce for their daily use. Various study assessing the pattern of collection of forest products and its impact on forest found that local livelihood dependence results in degradation (Davidar *et al.*, 2010).

b) Source of Light

Most of the villages do not have access to electricity. It has been found that most of the villagers are using solar power to light their house whereas as some villagers use kerosene to light their houses. The solar powers are purchased by themselves. The **Table 8.13** shows the source of Energy used to light their houses.

Table 8.13: Showing source of energy

Sl. No	Village Name	Source of Energy(%)	
		Solar	Kerosene
1	Golai	72.22	27.78
2	Dayalpur	37.50	62.50
3	Nagaon	80.95	19.05
4	Jiabari	64.91	35.09
5	Amlaiguri	90.63	9.38
6	Simuluguri	75.00	25.00
7	Gujunpuri	0.00	100.00
8	Deepanjali-6	58.33	41.67
9	Khirsiguri	80.00	20.00
10	Bengnaguri	66.67	33.33
11	Bwigribari	100.00	0.00
12	Milanpur	72.00	28.00
13	Azarbari	60.00	40.00
14	Oubari	62.50	37.50
15	Rupanjali	71.43	28.57
16	Ramnathpur No.1	80.00	20.00
17	Sonapur	60.00	40.00
18	Alubari	60.00	40.00
19	Ramnathpur	62.50	37.50

The study reveals that at an average of 66.03 % of population uses solar power to light their houses and rest of the population uses kerosene. About 70 % of the household in the villages of Golai, Dayalpur, Nagaon, Simuluguri, Khirsiguri, Milanpur, Rupanjali and Ramnathpur No.1 uses solar lamp to light their houses and 90.63 % of household in Amlaiguri and 100% of household in Bwigribari uses solar lamp respectively. In Gujunpuri the entire household reportedly uses kerosene to light their houses.

c) Source of Grazing Pasture

Grazing is known to be a cheapest way of feeding the livestock (Jodha, 2008). Grazing can be defined as a process by which domestic animals are being fed either on natural or cultural vegetation. The quality of palatable forage for wild herbivores is expected to be affected by the extensive grazing. Grazing can also cause soil compaction and damage to the forest plantations and even effect the regeneration of natural green cover. Almost all the villagers are using sanctuary as a free grazing ground. 71.1% of the total surveyed populations are allowing grazing in the sanctuary and in nearby forests. The highest percentage of grazing is found in Jiabari, Golai, Gujunpuri, Simuluguri, Bengaguri and Sonapur where the percentage is above 80% as shown in **Table 8.14**.

The surrounding villagers mostly used to graze their cattle inside the sanctuary leading a competition for fodder with wild herbivores and which finally result in the degradation of natural habitat. The villagers also entered illegally into the sanctuary for collection of thatch, fire wood, wild vegetables, fishes etc. and accelerated the process of habitat degradation. It is an established fact that overexploitation of forests and

grasslands leads to soil erosion, which in turn is responsible for floods, rising of river beds and loss of plant nutrients and even climatic change.

Table 8.14: Showing the % of Grazing in the Villages

Sl. No	Village Name	Grazing (in %)
1	Golai	88.89
2	Dayalpur	62.5
3	Nagaon	73.81
4	Jiabari	89.47
5	Amlaiguri	78.13
6	Simuluguri	83.33
7	Gujunpuri	88.89
8	Deepanjali-6	50
9	Khirsiguri	73.33
10	Bengnaguri	83.33
11	Bwigribari	57.14
12	Milanpur	52
13	Azarbari	70
14	Oubari	62.5
15	Rupanjali	65.71
16	Ramnathpur No.1	70
17	Sonapur	80
18	Alubari	60
19	Ramnathpur	62.5

Grazing by livestock is known to be an important issue for the management of the national park and protected area. Increase grazing and free roaming of livestock in the sanctuary has cause infestation of wildlife habitat by the invasive exotic weeds which have also resulted in decreased availability of edible grasses for the wild herbivores. Increasing domestic animal population is causing enormous grazing pressure on lands which has also lead to grassland deterioration and desertification (GOI, 2007 and Kala, 2009). In the present scenario of land and livestock management there is an urgent need to control and make policies on livestock grazing that are less

restrictive, rational and based on scientific principles. Karanth *et al.*, (2006) while studying in Bhadra Wildlife Sanctuary, Western Ghats have also found that human activities such as grazing of livestock in the park had serious affects on survival, regeneration and recruitment of some plant species.

8.4.8. Threats identified in the Sanctuary

The survey has also identified several key issues which are responsible for the ecological instability and environmental degradation in the wildlife sanctuary. Some major threats identified in the sanctuary were Poaching, hunting, and deforestation resulting from cutting down of forest for farm land and illegal logging. The data on illegal logging cannot be obtained quantitatively because of unwillingness of the villagers to answer this question. They were questioned on the occurrences of poaching and illegal logging activities going in the sanctuary. According to them some outsiders came to the sanctuary and they are doing this. The field survey results are shown in *Table 8.15* and *Table 8.16*.

During the survey respondent stated that there is a decline in the variety of plant and wild animal. The main reasons for the decline as stated by the villagers are due to decline in forest size because illegal cutting of trees that are a food source for animals; and poaching (killing of animals). *Plate 8.2* shows the incidence of poaching going in the Sanctuary. The respondent even stated poaching and hunting of the wild animals is still continuing. This may be due to the fact that the belt of foothills has become a shelter place for certain anti-social elements, criminals and extremist who take the advantage of almost non vigilance with regard to law and order as the area lies in the margins of both the state administrations.

Table 8.15: Perception towards Poaching

Sl. No.	Village Name	Any Poaching Incidence			Trend of Poaching		
		Yes	No	Don't know	Increased	Decreased	Don't know
1	Golai	89		11	78		22
2	Dayalpur	25	25	50	13	13	75
3	Nagaon	62	10	29	57	10	33
4	Jiabari	67	7	26	63	7	30
5	Amlaiguri	88	0	13	81	6	13
6	Simuluguri	67	17	17	67	0	33
7	Gujunpuri	22	78	0	22	78	0
8	Deepanjali-6	67	33	0	58	33	8
9	Khirsiguri	53	13	33	47	20	33
10	Bengnaguri	33	67	0	17	67	17
11	Bwigribari	71	14	14	57	14	29
12	Milanpur	52	32	16	60	28	12
13	Azarbari	70	0	30	65	5	30
14	Oubari	63	18	20	58	25	18
15	Rupanjali	69	11	20	60	6	34
16	Ramnathpur No.1	73	7	20	73	0	27
17	Sonapur	75	0	20	70	0	30
18	Alubari	70	7	23	67	0	33
19	Ramnathpur	88	0	13	75	0	25



Plate 8.2 : Incidence of Poaching Activities

Table 8.16: Perception of Illegal logging

Sl No	Village Name	Incident of Illegal Logging		
		Yes	No	Don't know
1	Golai	78	6	17
2	Dayalpur	50	13	38
3	Nagaon	76	5	19
4	Jiabari	74	11	16
5	Amlaiguri	88	3	9
6	Simuluguri	67	25	8
7	Gujunpuri	33	67	0
8	Deepanjali-6	67	8	25
9	Khirsiguri	80	13	7
10	Begnaguri	83	17	0
11	Bwigribari	71	0	29
12	Milanpur	56	28	16
13	Azarbari	60	30	10
14	Oubari	55	30	25
15	Rupanjali	63	23	14
16	Ramnathpur No.1	80	20	0
17	Sonapur	60	30	10
18	Alubari	70	20	10
19	Ramnathpur	75	13	13

Majority of the respondent have reported the incident of illegal logging going inside the sanctuary. The root causes identified in the survey were poverty, low agricultural practices, illiteracy and perception of lack of immediate benefits from conservation. Chan and Sasaki (2015) have also observed in that the main source of deforestation in Phnom Tbeng Forest is illegal logging because of its demand for commercial timber, timber for construction of houses and fences and firewood. Deforestation, encroachment, agricultural and other economic activities as well as associated activities in the study area have changed the land cover of the area.

The land cover change in the sanctuary has brought about changes in the ecosystem putting the flora and fauna of the area under considerable stress and strain. Deforestation and degradation of natural habitat has also increased the incident of human elephant conflicts in the surveyed villages. As a result, the elephants come out of forest area and cause depredation of agricultural crops on the fringes. The associated conflicts with the wildlife were identified as crop destruction, property loss to loss of lives and injuries. Crop raiding by elephants is a invasion of farms in search of food either as a result of farm locations within the animals range state or as a result of increase in animal population with a corresponding shortage of food supply from the wild. Annual flooding is also one of the important threats identified in the study area which is causing severe damage to sanctuary and even to the livelihood of the people. The effectiveness of these activities was found to have related to fragmented forest/ habitats and these has also resulted into the decline of elephant populations in the study area. The other threats identified in the sanctuary are posed by land use change by expansion of agriculture and habitation, livestock overgrazing and illicit wood cutting.

8.4.9. Awareness of Forest and Wildlife Conservation

In the study area most of the respondents were well aware of the fact that they are living near a protected area. But for their survival they have to depend on forest products as they are financially and economically very poor. During the survey most of the respondent has shown positive response for the conservation of the sanctuary. While answering the issues regarding the protection of the sanctuary 56.99% of the villagers wanted the sanctuary to be protected by modern amenities like putting guard wall, establishing observatory towers, etc, to restrict migration of wild animals and to protect the sanctuary from intruders. The villagers mainly wanted protection from the elephant as they causes huge loss of life, crop and property.

8.5. Conclusion

The present study reveals that the social status of the surveyed villages is very low and because of this people are highly dependent on the natural resources. Due to human intervention a larger part of the forests cover of the sanctuary has been wiped out. In all surveyed villages, forests are being used by the local communities to fulfil their daily requirements of fuel wood, livestock grazing, fencing around houses/farms and timber for construction of houses. Activities such as agriculture bring deforestation converting forests to farm lands and settlement ground which has reduced potential elephant habitats. Growth of settlements in the forest areas and associated reclamation of land for agricultural purpose have been identified as the major factor for the land cover change in the study area.

Habitat fragmentation and shrinking of habitat due to encroachment give rise to shrinking of space, food etc. in the forest which is required for the wild animals which

result in man-animal conflict. The major threats identified in the sanctuary were poaching, hunting, deforestation, illegal logging and annual flood. A proper management and planning program is needed for the conservation of the sanctuary. Participation of local people in management of the sanctuary should be promoted.

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