

Baseline Survey Report

Name of the project

Community-based Conservation of Forest Resources and
Enhancing Rural Livelihood in Rangamati of the Chittagong Hill Tracts

Implementing entity

Hill Flower, Rangamati
Partner NGO of Arannayk Foundation

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Introduction:

This report describes the baseline survey result designed to establish the initial conditions of the project “**Community-based Conservation of Forest Resources and Enhancing Rural Livelihood in Rangamati of the Chittagong Hill Tracts**” implemented by **Hill Flower**, Rangamati, partner NGO of Arannayk Foundation. The survey was designed to observe the current status of the biodiversity resources especially timber, fuel, medicinal plants and agricultural crops and their uses in homestead and hilly areas of the project participants. The project initially assumed that due to different natural disasters and ignorance of the people many beneficial and useful natural resources, which have sufficient timber, fuel and medicinal values, are destroying and endangering, which are very much important for human lives, natural conservation, prevention of climate changes, bio-diversity, ecological balance and conserving eco-system etc. Bangladesh has a number of plant species which have high timber, fuel and medicinal value as well as great impact on ecology and biodiversity. The market for tree products has increased to a great extent. To encourage the use of environment friendly forest products and for creating greater opportunity of bio-safety priority attentions are required to be given for conservation, production, processing, marketing and awareness building for the use of these products. In this connection the proposed base line survey tried to gather information on the current status of the homesteads and owned or leased hilly lands to which the local people depend for their timber, fuel and medicinal products and income. The survey also tried to appraise the biodiversity of the homesteads and the hills.

Objectives of the baseline survey:

- To assess the current status of the homesteads and hilly areas.
- To identify the biodiversity available in the homesteads and hilly areas of the study area.
- To identify the lost/endangered biodiversity from homesteads and hilly areas.

Methodology of the baseline survey:

The baseline survey was conducted at the homestead and hilly areas of the project area at 5 No. Wagga Union of Kaptai Upazilla in Rangamati to assess the forest resources, households’ economic status, their dependence on forest resources and gender role in agro forestry practices.

Homestead survey:

Homestead survey was conducted with a pre-structured questionnaire in the study area. A total of 100 households were surveyed from five tribal villages, namely, **Sapchari (n=30)**, **Hatimara (n=12)**, **Sapchari Monpara (n=29)**, **Tripurachari (n=17)** and **Tambapara (n=12)** villages who are selected as project participants by the Hill Flower from the study area. The head of each selected household was interviewed to gather required information. In the absence of the head

of the family the female head or any adult member of the family were interviewed. The collected data were analyzed and presented in the result section.

Description of the study area:

The studied area includes five villages, namely, Sapchari Monpara, Sapchari, Tripurachari, Hatimara and Tambapara under 5 no. Wagga Union, Kaptai Upazilla, Rangamati Hill district. The study area is inhabited by indigenous people and all of them are from Tonchongya tribe in Sapchari Monpara, Sapchari, Tripurachari and Hatimara villages and from Marma tribe in Tambapara village. All of them are dependent on hills for their livelihood and grow both forest and agricultural crops in and around the hills and valleys. Usually they grow Paddy, Zinger, Pineapple, Kochu (Arum), Turmeric, Alu (Hilly Alu) on hilly slopes along with timber and fruit trees (Photo 1). They also cultivate valleys and plain lands available in and around their homesteads and hills. A brief note on five selected villages is given below:

Sapchari Monpara is situated on the top of the hill and there is no agricultural land. Most of the tree species are planted by the indigenous people along with agricultural crops on the slope of the hills. The community people are fully dependent on the forest and jhum cultivation along with mixed plantation. The major problem of this village is communication.

Sapchari lies on the valley of the hill and there is also no pure agricultural land. But they convert some valley of the hills in agricultural land. In this converted agri-land they can not grow paddy but other agri- products such as sugar cane, vegetables etc. can be grown easily. They are also dependent on the hills like Sapchari Monpara.

Tripurachari is situated on the mid slope of the hills and the villagers have some portion of converted agri-land on the valley of the hills. They cultivate vegetables, agri-crops along with paddy. They are also fully depended on forests, jhum cultivation, mixed plantation and agriculture.

Hatimara is situated on the valley of the hills. They have large portion of converted agri-land on the valley of the hills. They also cultivate vegetables, agri-crops along with paddy. The amount of forest land is less than other villages.

Tambapara lies beside the Rangamati- Boroichari road. They have small amount of converted agri- land. Most of them are poor and less educated in comparison to the above villages.

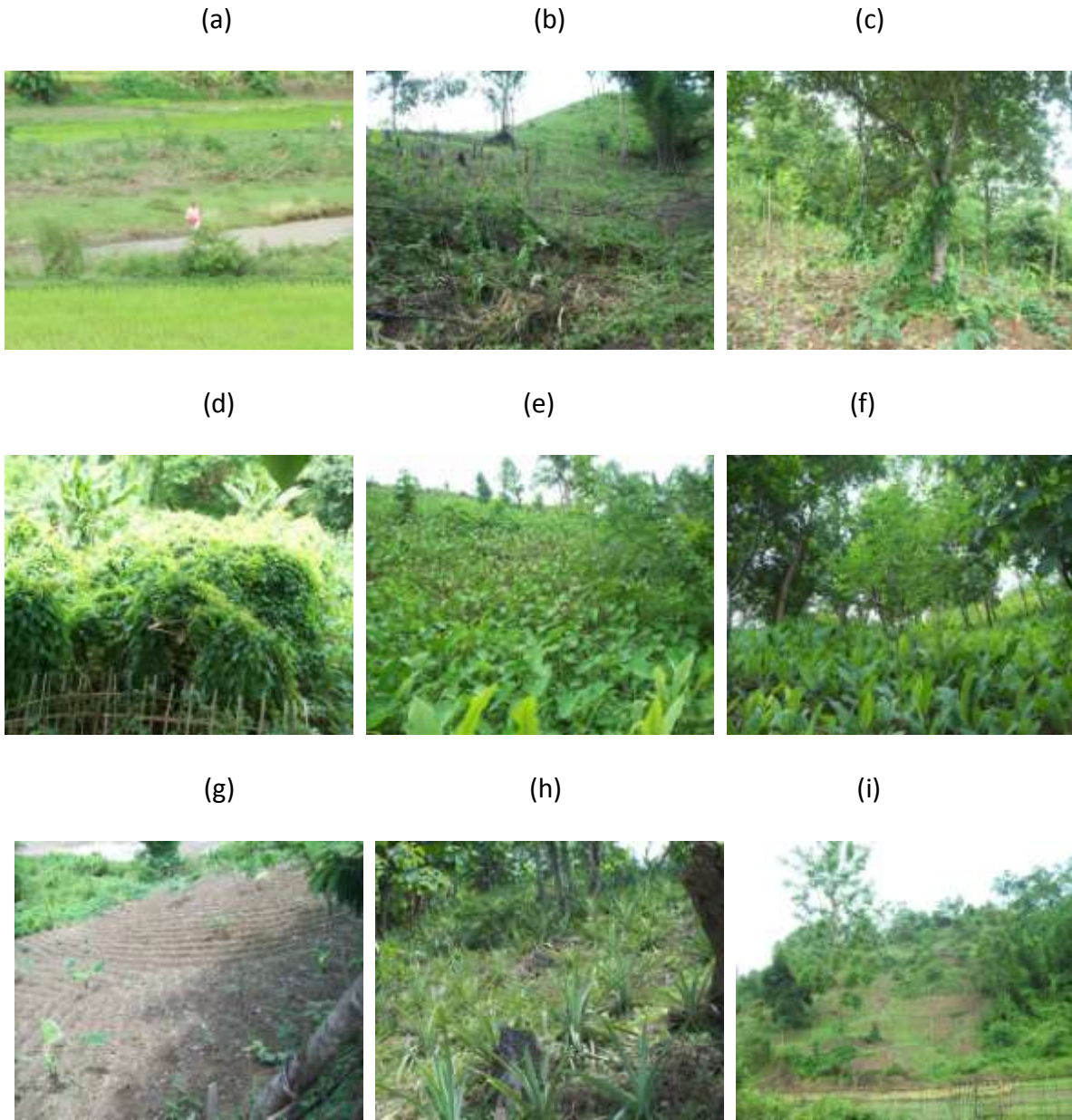


Photo 1: Cultivation of agri-crops in and around the hills ((a) Paddy in valleys, (b) Paddy on hill slopes, (c) Mixed cultivation on hill slopes (d) Hilly alu, (e) Kochu, (f) Turmeric, (g) Zinger, (h) Pineapple and (i) Mixed jhum cultivation)

Results:

Land resources, education, sex, family size and earning members

The result of the survey shows that land resources owned by each family in the study area is 453.13 decimals of which higher percentage of lands are hilly (85%) followed by crop land (10%) and homestead land (5%). However, average land resources owned by each family are higher in Sapchari Monpara (506.52 decimals) and lower in Tambapara (366.83 decimals) (Table 1). Homestead land is found comparatively higher in Sapchari Monpara (30.62 decimals) and Sapchari (25.87 decimals) village. On the otherhand in Hatimara (7.5 decimals) and Tambapara (4.67 decimals) the homestead land is very small (Table 1). Educational status of the respondents shows that 67 percent of them are literate of which most of them have at least primary level education (35%) (Table 2). Average family size in the study area is 5.38 of which 51 percent male and the rest 49 percent female members (Table 3). On average each family has 1.67 earning members of which 84 percent (1.41) is male and the rest 16 percent (0.26) is female (Table 3).

Table 1: Distribution of respondent households by land resources (in decimals).

Village Name	Homestead land					Crop land	Hilly land	Total land
	Dwelling	Trees	Animal shed	Yard	Sub total			
Sapchari	4.13	17.60	0.27	3.87	25.87 (5.21)	44.33 (8.92)	426.67 (85.87)	496.87 (100)
Hatimara	3.58	2.50	0.00	1.42	7.50 (1.90)	36.67 (9.27)	351.50 (88.84)	395.67 (100)
Sapchari Monpara	3.03	25.21	0.17	2.21	30.62 (6.05)	37.93 (7.49)	437.97 (86.47)	506.52 (100)
Tripurachari	3.00	7.76	0.94	2.35	14.06 (3.64)	74.12 (19.18)	298.24 (77.18)	386.41 (100)
Tambapara	2.83	0.75	0.25	0.83	4.67 (1.27)	36.67 (10.00)	325.50 (88.73)	366.83 (100)
Total	3.40	14.30	0.32	2.47	20.49 (4.52)	45.70 (10.09)	386.95 (85.39)	453.14 (100)

Table 2: Distribution of respondents by educational level.

Village Name	Illetrate (%)	Literate (%)					Sub total	Total
		Primary	Secondary	S.S.C.	H.S.C.	Graduate		
Sapchari (n=30)	33	10	20	30	3	3	67	100
Hatimara (n=12)	42	25	33	0	0	0	58	100
Sapchari Monpara (n=29)	28	48	21	3	0	0	72	100
Tripurachari (n=17)	29	53	12	6	0	0	71	100
Tambapara (n=12)	42	50	0	8	0	0	58	100
Total (n=100)	33	35	18	12	1	1	67	100

Table 3: Distribution of respondent households by sex, family size and earning member (values in the parentheses denote percentages).

Village Name	Family size			Earning member		
	Male	Female	Total	Male	Female	Total
Sapchari (n=30)	2.70 (53)	2.43 (47)	5.13 (100)	1.33 (70)	0.57 (30)	1.90 (100)
Hatimara (n=12)	3.58 (51)	3.42 (49)	7.00 (100)	1.75 (95)	0.08 (5)	1.83 (100)
Sapchari Monpara (n=29)	2.45 (49)	2.55 (51)	5.00 (100)	1.31 (90)	0.14 (10)	1.45 (100)
Tripurachari (n=17)	2.94 (52)	2.71 (48)	5.65 (100)	1.47 (96)	0.06 (4)	1.53 (100)
Tambapara (n=12)	2.58 (53)	2.33 (47)	4.92 (100)	1.42 (85)	0.25 (15)	1.67 (100)
Total (n=100)	2.76 (51)	2.62 (49)	5.38 (100)	1.41 (84)	0.26 (16)	1.67 (100)

Occupation

Respondent households' were analyzed according to their family occupation. It is seen that agriculture and tree farming (93%) is the major primary occupation in the study area followed by service (3%), business (2%) and daily labour (2%). All the families in the Sapchari Monpara village (100%) are involved in farming as primary occupation. Few families (24%) were found to have secondary occupation of which most of them are involved in daily labour (11%) and farming (7%) (Table 4).

Table 4: Distribution of respondent households by occupation (in percentage) in the study area.

Village Name	Primary Occupation					Secondary Occupation				
	Far.	Ser.	Busi.	Lab.	Total	Far.	Ser.	Busi.	Lab.	Total
Sapchari (n=30)	90	7	3	0	100	10	0	0	3	13
Hatimara (n=12)	92	8	0	0	100	8	8	0	8	25
Sapchari Monpara (n=29)	100	0	0	0	100	0	0	3	14	17
Tripurachari (n=17)	94	0	0	6	100	6	12	12	18	47
Tambapara (n=12)	83	0	8	8	100	17	0	0	17	33
Total	93	3	2	2	100	7	3	3	11	24

Note: Far. = Agriculture and tree farming, Ser. = Service, Busi. = Business, Lab. = Daily labour

Family income

Analysis of the family income by the respondent households' show that average family income in the study area is 65673 Taka/year of which maximum amount of the income (79%) including 53% income from crops and 26% income from tree products comes from farming followed by service (14%). However average family income was found highest in Sapchari village (79975 Taka/year) and lowest in Hatimara village (58125 Taka/year). It is interesting to see that people of the Hatimara and Sapchari village also earning some income (only 0.49% and 0.17% respectively) from medicinal products (Tables 5).

Table 5: Distribution of households' family income (Taka/year) in the study area (values in the parentheses denote percentage of total income)

Village Name	Framing				Service	Labour	Other	Total
	Crop	Tree	Medicinal	Total				
Sapchari (n=30)	36442 (45.57)	25546 (31.94)	133 (0.17)	62122 (77.68)	17853 (22.32)	0 (0.00)	0 (0.00)	79975 (100)
Hatimara (n=12)	36733 (63.20)	10125 (17.42)	283 (0.49)	47142 (81.10)	6000 (10.32)	3000 (5.16)	1983 (3.41)	58125 (100)
Sapchari Monpara (n=29)	37111 (62.47)	14157 (23.83)	69 (0.12)	51337 (86.42)	4966 (8.36)	2000 (3.37)	1103 (1.86)	59406 (100)
Tripurachari (n=17)	24024 (40.23)	13860 (23.21)	0 (0.00)	37884 (63.44)	8894 (14.89)	5059 (8.47)	7882 (13.20)	59719 (100)

Tambapara (n=12)	37108 (60.78)	13558 (22.21)	0 (0.00)	50667 (82.99)	0 (0.00)	4300 (7.04)	6083 (9.96)	61050 (100)
Total (n=100)	34640 (52.75)	16968 (25.84)	94 (0.14)	51701 (78.73)	9028 (13.75)	2316 (3.53)	2628 (4.00)	65673 (100)

Plant diversity

Table 6 shows the plant diversity present in the homesteads of the study area. A total of 38 different species were found in the homesteads and hills of the study area. Usually the community people are more dependent on crops and tree products that are grown in and around the homesteads and hilly areas occupied or owned by them. Among plant diversity different timber, fruit and medicinal species are found growing. It is evident that **Gamar** (95%), **Am** (94%) and **Segun** (88%) were found dominating in the homesteads and hills of the study area (Table 6). Species density was found highest for **Gamar** (710.24) followed by **Segun** (520.37), **Banana** (45.16%), **Bamboo** (37.30) and **Am** (32.63). In total species density was found 1510.84 in the study area which seems very good from bio-diversity point of view. This is due to the fact that the community people are planting some of the important species in greater numbers. In case relative density highest percentage was also observed for **Gamar** (47%) followed by **Segun** (34%), **Banana** (2.99), **Bamboo** (2.47) and **Am** (2%) (Table 6).

Table 6: Analysis of the plant diversity present in the study area

Sl. No.	Species Name	Scientific Name	Species Frequency		Species Density (%)	Relative density (%)
			No. of trees	Household (%)		
1	Achar gula	<i>Grewia microcos</i>	102	12	1.02	0.07
2	Akashmoni	<i>Acacia auriculiformis</i>	33	2	0.33	0.02
3	Am	<i>Mengifera indica</i>	3263	94	32.63	2.16
4	Amloki	<i>Phyllanthus embelica</i>	249	34	2.49	0.16
5	Amra	<i>Spondius dulcis</i>	45	13	0.45	0.03
6	Ata	<i>Annona squamosa</i>	35	11	0.35	0.02
7	Bamboo	<i>Bambusa vulgaris</i>	3730	39	37.30	2.47
8	Banana	<i>Musa sapientum</i>	4516	35	45.16	2.99
9	Bel	<i>Aegle marmelos</i>	19	13	0.19	0.01
10	Bhadi	<i>Gariga pinnata</i>	36	9	0.36	0.02
11	Bohera	<i>Terminalia belerica</i>	222	24	2.22	0.15
12	Chalta	<i>Dillenia indica</i>	19	7	0.19	0.01
13	Coconut	<i>Cocos nucifera</i>	505	87	5.05	0.33
14	Itchri	<i>Anogeissus acuminata</i>	111	12	1.11	0.07
15	Gamar	<i>Gmelina arborea</i>	71024	95	710.24	47.01
16	Garjon	<i>Dipterocarpus turbinatus</i>	70	7	0.7	0.05
17	Gutgutia	<i>Bursera serrata</i>	74	12	0.74	0.05

18	Haritaki	<i>Terminalis chebula</i>	61	9	0.61	0.04
19	Jalpai	<i>Elaeocarpus robustus</i>	88	15	0.88	0.06
20	Jam	<i>Syzygium cumini</i>	343	33	3.43	0.23
21	Jambura	<i>Citrus grandis</i>	394	46	3.94	0.26
22	Kanthal	<i>Artocarpus heterophyllus</i>	2421	94	24.21	1.60
23	Khejur	<i>Phoenix sylvestris</i>	7	3	0.07	0.00
24	Koroi	<i>Albizia procera</i>	1952	62	19.52	1.29
25	Kul	<i>Zizyphus mauritiana</i>	84	19	0.84	0.06
26	Lebu	<i>Citrus aurantifolia</i>	97	7	0.97	0.06
27	Litchi	<i>Litchi chinensis</i>	1471	72	14.71	0.97
28	Mahagony	<i>Swietenia mahagoni</i>	191	12	1.91	0.13
29	Neem	<i>Azadirachta indica</i>	223	36	2.23	0.15
30	Painna gula	<i>Flacourtia jangomas</i>	37	11	0.37	0.02
31	Papaya	<i>Carica papaya</i>	1468	31	14.68	0.97
32	Peara	<i>Psidium guajava</i>	2410	37	24.1	1.60
33	Sajne	<i>Moringa oleifera</i>	1486	42	14.86	0.98
34	Segun	<i>Tectona grandis</i>	52037	88	520.37	34.44
35	Sofeda	<i>Manilkara zapota</i>	53	6	0.53	0.04
36	Supari	<i>Areca catechu</i>	1062	61	10.62	0.70
37	Tentul	<i>Tamarindus indica</i>	136	29	1.36	0.09
38	Tetua Koroi	<i>Albizia odoratissima</i>	1010	39	10.1	0.67
Total				151084	1510.84	100

It is interesting to see that the species density and relative density is excessively higher for Gamar (710.24% & 47.01%) and Segun (520.37% & 34.44%) (Table 6). This is because the community people at present are planting only these two species at greater numbers in the hills to get economic benefits. Most of the households (86%) responded that the plant species are planted by themselves and only 14% responded that they are naturally occurring (Table 7). The households collect the planting materials (seedlings) from private nursery (59%) followed by own sources (36%) (Table 7). Among the agricultural crops most of the households responded that they grow **Zinger** (93%), **Turmeric** (88%) and **Vegetables** (88%) (Table 8). Among the vegetables **Pamkins**, **Beans**, **Brinjal** are the common crops grown by the respondents in the study area.

Table 7: Distribution of respondent households (%) by mode of occurrence and source of seedlings.

Village Name	Mode of occurrence			Source of seedlings			
	Planted	Natural	Total	Nursery	Own	Others	Total
Sapchari	89.60	10.40	100.00	56.00	30.83	13.17	100.00
Hatimara	92.08	7.92	100.00	62.50	37.50	0.00	100.00

Sapchari Monpara	79.86	20.14	100.00	65.31	33.66	1.03	100.00
Tripurachari	89.41	10.59	100.00	51.76	42.35	5.88	100.00
Tambapara	82.50	17.50	100.00	58.33	41.67	0.00	100.00
Total	86.19	13.81	100.00	59.04	35.71	5.25	100.00

Table 8: Distribution of respondent households (%) by agricultural crops and other products grown in the hills.

Agricultural Crops	Households (%)
Anaras	3
Paddy	49
Sungrass	16
Zinger	93
Turmeric	88
Olkochu	29
Vegetables (pamkins, beans, brinjal, etc.)	85

Income from tree and agricultural products

The respondents in the study area were asked to know the cost and benefit from tree products grown by them annually. It is found that on average each family earns a net benefit of 5371 (Taka/year) from fruits and 9391 (Taka/year) from timbers that give them a total net benefit of 14762 Taka/year (Table 9). On the other hand, each family earns a net benefit of 7651 (Taka/year) from vegetables and 37461 (Taka/year) from spices (zinger, turmeric etc.) grown by them (Table 10). It is interesting to see that the respondent households sell almost all the spices (97%) in the market to get economic benefit and only 3% of the spices grown are used by themselves. On the contrary they sell 54% vegetables they produce in the market and use the rest 46% for their own consumption (Table 10).

Table 9: Distribution of respondent households by income from fruits and timber (Taka/year/per household) grown by them.

Village name	Income from fruits			Income from timber			Total income		
	Cost	Benefit	Net Benefit	Cost	Benefit	Net Benefit	Cost	Benefit	Net benefit
Sapchari	3072	8525	5453	4350	15283	10933	7422	23808	16386
Hatimara	583	6525	5942	350	6542	6192	933	13067	12133
Sapchari Monpara	1296	8817	7522	1093	7628	6534	2389	16445	14056
Tripurachari	903	4531	3628	882	10865	9982	1785	15396	13611
Tambapara	567	2433	1867	3650	18450	14800	4217	20883	16667
Total	1589	6960	5371	2252	11643	9391	3841	18603	14762

Table 10: Distribution of respondent households by use (% per households) and income (Taka/year/households) from vegetables and spices.

Village Name	Vegetables					Spices				
	Own use (%)	Sale (%)	Benefit	Cost	Net benefit	Own use (%)	Sale (%)	Benefit	Cost	Net benefit
Sapchari	36	64	14369	4350	10019	2	98	74620	13005	61615
Hatimara	46	54	13122	3478	9644	2	98	45455	20182	25273
Sapchari Monpara	53	47	4700	1067	3633	3	97	51176	17731	33445
Tripurachari	42	58	8169	1869	6300	5	95	29750	9906	19844
Tambapara	57	43	12417	1558	10858	4	96	34417	11500	22917
Total	46	54	10169	2519	7651	3	97	52160	14519	37641

Lost Species

The homestead survey tried to find out the species that are lost from the homesteads and hilly regions of the study area. The respondent households were asked to identify the names (s) of the lost species from their homesteads and hilly lands. It is found that a total of 21 species were identified by the respondents that were lost from the locality. Among the lost species Chorai tree (61%), Jaganna Gula (61%), Civit (59%), Barta (47%), Dup tree (47%) and Garjan (46%) are the mostly answered plant species that are lost from the study area (Table 11).

Causes of and problems faced due to loss of species

The respondents were also asked to identify the causes of and problems faced due to loss of plant species from the study area. It is found that jhum cultivation (88%) is identified as the major cause of biodiversity loss followed by lack of market demand (77%), establishment of sawmills (43%) near the locality that encourages them to cut and sell timber for extra income, lack of replanting (42%), brickfields (34%) and population pressure and lack of food and shelter (11%) in the study area (Table 12). The respondent households were also identified a lot of problems they are facing due to biodiversity loss from the study area (Table 13). Some of the mentionable problems identified by majority of the respondents are lower production (81%) for both crops and trees, drying up of creeks and small river or chara (69%), less rainfall (55%) and higher temperature (41%) (Table 13). It is very interesting to note that some of the community people specially the aged people believe that loss of biodiversity is the major cause for drying up of creeks or chara which is causing problem of water shortage and **Chorai tree** is an important species lost from the locality that is responsible for water shortage in the creeks or chara. They still believe that if chorai tree can be planted along the creeks or chara there will be no water shortage in the streams or chara.

Table 11: Respondents' perception (% households) about lost species in the study area.

Species Name	Scientific Name	Village Name					Total
		Sapchari	Hatimara	Sapchari Monpara	Tripurachari	Tambapara	
Achar Gula	<i>Grewia microcos</i>	50.00	8.33	34.48	47.06	0.00	34
Bohera	<i>Terminalia belerica</i>	30.00	16.67	10.34	5.88	0.00	15
Barta	<i>Artocarpus lacucha</i>	50.00	33.33	55.17	23.53	66.67	47
Cane Tree	-	30.00	25.00	13.79	0.00	0.00	16
Chalta	<i>Dillenia indica</i>	6.67	0.00	0.00	0.00	0.00	2
Chorai Tree	<i>Piper chaba</i>	83.33	33.33	58.62	41.18	66.67	61
Chundul	<i>Tetramelis nudiflora</i>	23.33	0.00	20.69	23.53	16.67	19
Civit	<i>Swintonia floribunda</i>	90.00	50.00	44.83	58.82	25.00	59
Dumur	<i>Ficus semicordata</i>	30.00	8.33	10.34	17.65	0.00	16
Dup tree	<i>Canarium resinifeium</i>	43.33	25.00	68.97	47.06	25.00	47
Garjan	<i>Dipterocarpus turbinatus</i>	50.00	50.00	48.28	35.29	41.67	46
Gila Lata	<i>Derris trifoliata</i>	10.00	25.00	6.90	17.65	0.00	11
Goda	<i>Vitex peduncularia</i>	26.67	0.00	3.45	5.88	0.00	10
Gutguttiya	<i>Bursera serrata</i>	26.67	0.00	10.34	29.41	0.00	16
Jaganna Gula	<i>Ficus racemosa</i>	60.00	58.33	65.52	35.29	91.67	61
Kau Gula	<i>Garcinia cowa</i>	33.33	50.00	10.34	17.65	41.67	27
Ko Ful	-	6.67	8.33	3.45	5.88	0.00	5
Kusum	<i>Schleichera olosa</i>	13.33	8.33	17.24	29.41	25.00	18
Medha	<i>Trewia polioarpa</i>	23.33	0.00	6.90	5.88	0.00	10
Tali Tree	<i>Dichopis polyantha</i>	33.33	33.33	13.79	0.00	8.33	19
Tulshi	<i>Ocimum sanctum</i>	10.00	0.00	10.34	35.29	16.67	14

Table 12: Distribution of respondent households (%) by the causes for bio-diversity loss in the study area.

Reasons identified by the households	Name of villages					
	Sapchari (% HH)	Hatimara (% HH)	Sapchari Monpara (% HH)	Tripurachari (% HH)	Tambapara (% HH)	Total (% HH)
Jhum cultivation	80	100	97	71	100	88
Brickfields	40	33	24	41	33	34
Sawmills	57	58	28	29	50	43
Lack of market demand	77	33	83	88	92	77
Lack of replanting	50	67	41	24	25	42
Population pressure and Lack of food and shelter	17	8	17	0	0	11

Note: % HH = Percentage households responded.

Table 13: Distribution of respondent households (%) by the problems faced due to bio-diversity loss in the study area.

Problems due to biodiversity loss	Name of villages					
	Sapchari (% HH)	Hatimara (% HH)	Sapchari Monpara (% HH)	Tripurachari (% HH)	Tambapara (% HH)	Total (% HH)
Drying up of creeks and small river or chara	73	58	66	53	100	69
Lower production	80	92	79	82	75	81
Less rainfall	60	33	41	65	83	55
More diseases	20	33	24	6	17	20
Higher temperature	13	8	48	129	0	41
Higher attack by wild animal	33	8	7	59	25	26
Water table go down	10	0	17	6	0	9
Soil erosion	3	0	10	6	17	7
Hill slide	0	0	14	12	17	8

Note: % HH = Percentage households responded.

Recommendation for biodiversity conservation

The respondent households were asked to know their perception about how to overcome the loss of biodiversity from the study area. It is evident that most of the households responded to plant indigenous species (79%) followed by planting medicinal species (55%), planting trees along with agricultural crops or jhum and applying modern technology to conserve lost species (30%) (Table 14).

Table 14: Distribution of respondent households by their recommendation for biodiversity conservation.

Recommendation	Percentage Households (%)
Planting indigenous tree	79
Planting medicinal species	55
Planting trees along with agricultural crops or Jhum	46
Apply modern technology to conserve lost species	30
Fertilizer application for more production	5
Training on how to plant and manage biodiversity	18
Mixed plantation	27
Financial support	16

Collection of forest resources

The study also tried to collect information regarding collection of forest resources other than timber from the hills owned or occupied by them in the study area. It is found that the respondent on average collect 100 maund of fuel and 4 bundle of sungrass travelling 1.31 km distance from their homesteads (Table 15).

Table 15: Collection of forest resources from the hills owned or occupied by them.

Village name	Fuel (Maund)	Sungrass (Bundle)	Distance (Km)
Sapchari	108.20	0.33	1.31
Hatimara	108.33	0.00	1.50
Sapchari Monpara	100.34	3.93	1.33
Tripurachari	84.47	14.53	1.16
Tambapara	91.67	1.25	1.25
Total	99.92	3.86	1.31

Distribution of labour in homestead agro-forestry activities

The household survey also tried to identify the labour involvement in homestead agro-forestry activities especially on women involvement. Table 16 shows the different agro-forestry activities in the homesteads with the labour involvement based on sex and hired labour. It is found that male member (s) of the household perform more than 75 percent of the total activity followed by female member (s) (16%) in the study area (Table 16). It is interesting to see that percentage of hired labour (8%) working in different agroforestry activities of the homesteads are very low. It is also seen that women are particularly taking part at comparatively higher percentage in planting (17%), nursing (19%), harvesting (23%) and fruit/product processing (21%) in the study area (Table 16).

Table 16: Distribution of labour (%) in homestead agroforestry activities.

Agro-forestry activities	Male		Female		Total
	Own	Hired	Own	Hired	
Planning	90.95	0.00	9.05	0.00	100
Choice of species	94.60	0.00	5.40	0.00	100
Seedling collection	94.20	0.40	5.40	0.00	100
Propagation	70.80	14.30	14.50	0.40	100
Planting	64.05	18.55	17.00	0.40	100
Nursing	64.86	15.10	19.24	0.80	100
Fertilizer	80.72	3.09	16.19	0.00	100
Weeding	49.00	27.10	22.30	1.60	100
Harvesting	68.14	8.65	22.78	0.43	100
Trees	80.21	6.25	13.54	0.00	100
Fruits	67.28	9.78	22.93	0.00	100
Vegetable	61.04	9.48	29.06	0.42	100
Spices	57.14	17.76	23.37	1.73	100
Medicinal	75.00	0.00	25.00	0.00	100
Processing	72.70	6.50	20.70	0.10	100
Selling	98.30	0.00	1.70	0.00	100
Total	75.43	8.09	16.15	0.33	100

Social/Development organizations working in the study area

The study also tried to find out the organisations working in the study area for social and/or other development. It is found that there are at least 8 government approved nongovernmental organizations (NGOs) working in the study area for different kinds of activities (Table 17). Major organizations working in the study area and percentage households involved are Grameen Bank (33%), IDF (15%), BRAC (10%), BRDB (6%), Khushi Bank (5%), etc. The activities by these NGOs include mainly loan, social development, etc.

Table 17: Distribution of NGOs activity in the study area.

NGO Name	Household responded (%)	Total members
ASA	1	20
BRAC	10	19
BRDB	6	18
Grameen Bank	33	43
IDF	15	25
Islami Insurance	1	8
Khrishi Bank	5	22
Unicef	1	-

Conclusion:

Finally, it can be said that the people of the study area are mainly dependent on agro-forestry products they get from their homesteads and hilly areas (Tables 5, 9 & 10). The community people have got enough hilly lands (Table 1) to plant trees and produce agricultural crops or spices. Currently they are interested to plant some economically important plant species like, Gamar, Segun, Am, Banana, Khantal, Zinger, Turmeric, Pineapple, Beans, Pamkins, brinjals and other vegetables (Tables 6 & 8). But they are not that much aware to replant or restore the species they are destroying through jhum or other planting methods (Photo 1) to meet their daily necessities. In doing so they are destroying the biodiversity of the homesteads and hilly areas (Table 11). The community people identified that jhum is the major cause of biodiversity loss (Table 12). It is a matter of great hope that the people of the study area have realised the adverse effect of the biodiversity loss from their homesteads and hilly regions especially for some important species as they are facing problems like lower production, drying up of creeks and small river or chara, less rainfall, higher temperature, increased and frequent attack by wild animals, shortage of water, etc (Table 13). So they are now interested to plant and restore their homestead biodiversity with those species specially the indigenous one which will enrich biodiversity and be useful for their family purposes and can earn extra income for the family (Table 14). If this project can successfully implement their activities in the study area it will bring a positive impact on the biodiversity of the region and help people earn extra money from commercially producing and marketing timber, fuel, and medicinal or herbal plant resources that will enrich the biodiversity of the region and certainly improve the environmental quality of the locality.