

Baseline Survey Report

Name of the project

Promotion and Motivation of Herbal Plants Gardening, Medicine
Practice & Small Enterprises in the CHTs

Implementing entity

Juno Pawr, 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 “**Promotion and Motivation of Herbal Plants Gardening, Medicine Practice & Small Enterprises in the CHTs**” implemented by **Juno Pawr**, Rangamati, partner NGO of Arannayk Foundation. The survey was designed to observe the current status of the biodiversity resources especially medicinal or herbal plants and their uses in homesteads and hilly lands of the project participants. Since time immemorial, a traditional healing and ailment of diseases has been practiced by the most of the indigenous healers locally known as Boidya(s) in the CHTs. The project initially assumed that due to demography, different natural disasters and ignorance of the people many beneficial and useful natural resources, which have sufficient 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, especially CHTs, has a number of herb and other species which have high medicinal value as well as great impact on ecology and biodiversity. The market for herbal or medicinal products has increased to a great extent. To encourage the use of environment friendly herbal 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 hills to which indigenous people depend for their timber, fuel, medicinal or herbal products and income. The survey also tried to appraise the possibility of herbal plants gardening, medicine practice and the biodiversity of the homesteads and the hilly lands.

Objectives of the baseline survey:

- To assess the socio-economic status of the indigenous households of the study area.
- To identify the biodiversity currently available in the homesteads and hilly lands especially the herbal or medicinal species of the study area.
- To identify the lost/endangered biodiversity from homesteads especially the herbal or medicinal species of the study area.

Methodology of the baseline survey:

The baseline survey was conducted at the homestead level to assess the homestead forests, households’ economic status, their dependence on homestead forest resources and gender role in homestead agro forestry practices.

Homestead survey: Homestead survey was conducted with a pre-structured questionnaire in the study area. A total of 50 households were surveyed taking 25 each from both Hazachara village of Subalong Union of Barkol Upazilla and Mubachari village of 5 No. Bandukbhanga Union of Rangamati Sadar Upazilla, Rangamati randomly 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 village of Hazachara is located at Subalong union under Barkol Upzilla and the village of Mubachari is located at 5 No Bondukbhanga union under Sadar Upzilla in Rangamati district. The whole area of Hazachara and Mubachari are bounded by water. Generally there is no agricultural land in the study area as the valley and low lying land have gone under water after the establishment of Kaptai Dam. But in Mubachari the people have some agricultural land which goes under water during rainy season. In dry season farmers can cultivate these lands and grow mainly paddy. Peoples' livelihoods of Hazachara are fully depended on their Mon (Hill). They cultivate different types of agricultural crops on their Mon. The people of Mubachari are engaged in fishing and earn a lot of money. But the people of Hazachara are not engaged in fishing, whereas the rehabilitated plain land people are engaged in fishing. The people of Hazachara and Mubachari are deprived of education and medical services due to lack of educational institution and hospitals in the locality. People are not very much aware about education and highly educated people are rare in these locations. Women are more illiterate. In Hazachara and Mubachari, most of the plant species are planted. There are also some indigenous species occurring naturally. Various medicinal species were seen growing naturally in the locality but their number has decreased day by day due to the lack of awareness about the importance of medicinal plant.

Results:

Land resources and respondents' educational status

The result of the survey shows that land resources owned by each family in the study area is 467.21 decimals of which higher percentage of lands are hilly (59%) comprising tree areas followed by homestead land (23%) and crop land (17%). However, average land resources owned by each family are higher in Hazachara (486.82 decimals) compared to Mubachari (447.60 decimals) (Table 1). Homestead land is found comparatively higher in Mubachari (148.20 decimals) compared to Hazachara (69.94 decimals) village (Table 1). Educational status of the respondents shows that 70 percent of them are literate of which most of them have at least primary level education (52%) (Table 2).

Table 1: Distribution of respondent households by land resources in decimals (values in the parentheses denote percentages)

Village Name	Homestead					Crop land	Hilly land	Medicinal	Others	Total
	Dwelling unit	Trees	Animal shed	Yard	Sub total					
Hazachara (n= 25)	3.44 (0.71)	64.68 (13)	0.00	1.82 (0.37)	69.94 (14)	92 (18.90)	322.80 (66.31)	0.08 (0.02)	2.00 (0.41)	486.82 (100)
Mubachari (n= 25)	5.20 (1.16)	138.32 (31)	0.92 (0.21)	3.76 (0.84)	148.20 (33)	70 (15.64)	229.40 (51.25)	0.00	0.00	447.60 (100)
Total (n= 50)	4.32 (0.92)	101.50 (22)	0.46 (0.10)	2.79 (0.60)	109.07 (23)	81 (17.34)	276.10 (59.10)	0.04 (0.01)	1.00 (0.21)	467.21 (100)

Table 2: Distribution of respondent households by respondents' educational status.

Village Name	Illiterate	Literate					Sub Total	Total
		Primary	Secondary	S.S.C.	H.S.C.	Graduate		
Hazachara (n= 25)	9 (36)	10 (40)	4 (16)	1 (4)	1 (4)	0	16 (64)	25 (100)
Mubachari (n= 25)	6 (24)	16 (64)	1 (4)	2 (8)	0	0	19 (76)	25 (100)
Total (n= 50)	15 (30)	26 (52)	5 (10)	3 (6)	1 (2)	0	35 (70)	50 (100)

Family size, sex and earning members

Average family size in the study area is 4.90 of which 53 percent male and the rest 47 percent female members (Table 3). However family size is comparatively higher in Hazachara (5.04) than Mubachari (4.76). On average each family has 1.6 earning members of which 75 percent (1.2) is male and the rest 25 percent (0.40) is female (Table 4).

Table 3: Distribution of respondent households by sex and family size.

Age Category	Hazachara (n=25)			Mubachari (n=25)			Total (n=50)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	0.16 (3)	0.24 (5)	0.40 (8)	0.16 (3)	0.16 (3)	0.32 (7)	0.16 (3)	0.20 (4)	0.36 (7)
5-10	0.28 (6)	0.24 (5)	0.52 (10)	0.28 (6)	0.44 (9)	0.72 (15)	0.28 (6)	0.34 (7)	0.62 (13)
10-20	0.48 (10)	0.52 (10)	1.00 (20)	0.64 (13)	0.32 (7)	0.96 (20)	0.56 (11)	0.42 (9)	0.98 (20)
20-30	0.60 (12)	0.48 (10)	1.08 (21)	0.40 (8)	0.40 (8)	0.80 (17)	0.50 (10)	0.44 (9)	0.94 (19)
30-40	0.36 (7)	0.44 (9)	0.80 (16)	0.36 (8)	0.24 (5)	0.60 (13)	0.36 (7)	0.34 (7)	0.70 (14)
40-50	0.40 (8)	0.32 (6)	0.72 (14)	0.32 (7)	0.40 (8)	0.72 (15)	0.36 (7)	0.36 (7)	0.72 (15)
>50	0.32 (6)	0.20 (4)	0.52 (10)	0.40 (8)	0.24 (5)	0.64 (13)	0.36 (7)	0.22 (4)	0.58 (12)
Total	2.60 (52)	2.44 (48)	5.04 (100)	2.56 (54)	2.20 (46)	4.76 (100)	2.58 (53)	2.32 (47)	4.90 (100)

Table 4: Distribution of respondent households by earning members

Village name	Male	Femal	Total
Hazachara (n=25)	1.32 (73)	0.48 (27)	1.80 (100)
Mubachari (n=25)	1.08 (77)	0.32 (23)	1.40 (100)
Total (n= 50)	1.20 (75)	0.40 (25)	1.60 (100)

Occupation

Respondent households' were analyzed according to their family occupation. It is seen that agriculture and tree farming (100%) is the only primary occupation in the study area. Among the respondent households 34 % have got secondary occupation of which 22% depend on fishing as secondary source of income (Table 5).

Table 5: Distribution of respondent households by occupation.

Village Name	Primary Occupation	Secondary Occupation						Sub total
	Farming	Service	Business	Labor	Boat making	Net making	Fishing	
Hazachara (n=25)	25 (100)	1 (4)	1 (4)	1 (4)	-	-	-	3 (12)
Mubachari (n=25)	25 (100)	-	1 (4)	-	1 (4)	1 (4)	11 (44)	14 (56)
Total (n=50)	50 (100)	1 (2)	2 (4)	1 (2)	1 (2)	1 (2)	11 (22)	17 (34)

Family income

Analysis of the family income by the respondent households' show that average family income in the study area is 82514 Taka/year of which higher amount of the income (58%) comes from tree products followed by agricultural products (20%), others mainly consisting of daily labour (10%), service (6%) and fish (3%). However average family income was found higher in Hazachara village (100916 Taka/year) compared to Mubachari village (64112 Taka/year). It is interesting to see that people of both the villages is earning some income (only 0.25%) from medicinal products (Tables 6).

Table 6: Distribution of households' family income (Taka/year) in the study area (values in the parentheses denote percentage of total income)

Village name	Agri Product	Tree product	Medicinal	Fish	Poultry	Dairy	Business	Service	Others	Total
Hazachara (n= 25)	29504 (29.24)	63480 (62.90)	240 (0.24)	80 (0.08)	104 (0.10)	20 (0.02)	0	5760 (5.71)	1728 (1.71)	100916 (100)
Mubachari (n= 25)	3920 (6.11)	32780 (51.13)	176 (0.27)	4072 (6.35)	692 (1.08)	1712 (2.67)	2600 (4.06)	4000 (6.24)	14160 (22.09)	64112 (100)
Total (n= 50)	16712 (20.25)	48130 (58.33)	208 (0.25)	2076 (2.52)	398 (0.48)	866 (1.05)	1300 (1.58)	4880 (5.91)	7944 (9.63)	82514 (100)

Plant diversity

Table 7 shows the plant diversity present in the homesteads of Hazachara and Mubachari villages. It is evident that Kanthal (100%) was found dominating in the homesteads of Hazachara followed by Segun (96%), Gamar (96%), Am (96%), Litchi (88%), Narikel (70%), Banana (84%) (Table 7). Species density was found highest for Segun (672) followed by Gamar (509), Banana (446), Kanthal (79) Supari (72) and Litchi (52) in Hazachara village. In case relative density highest percentage observed for Segun (32%) followed by Gamar (24%) and Banana (21%). On the other hand, Segun (100%) was found most dominating species in Mubachari village followed by Gamar (96%), Am (96%), Kanthal (96%), Medha (80%), Banana (72%) and Litchi (72%). Species density was found highest for Segun (201) followed by Banana (124), Gamar (77.6), Kanthal (60.1) and Basok (54). In case relative density highest percentage observed for Segun (26%) followed by Banana (16%), Gamar (10%) and Kanthal (8%) in Mubachari village (Table 7). From biodiversity point of view a total of 90 different plant species were found growing in the study area of which 75 different plant species were found growing in Mubachari village and 71 different plant species were found growing in Hazachara village. However species density was found much higher in Hazachara village (2130.20) compared to Mubachari village (766.04) (Table 7).

Table 7: Comparative analysis of plant diversity present in the study area (HH= Households responded, SD= Species density, RD= Relative density)

Sl. No.	Species Name		Hazachara (n=25)				Mubachari (n=25)			
			No. of trees	HH (%)	SD	RD (%)	No. of trees	HH (%)	SD	RD (%)
1	Achar gula	<i>Grewia microcos</i>	47	16	1.88	0.09	199	32	7.96	1.04
2	Agar	<i>Aquilaria agalocha</i>	5	8	0.2	0.01	15	12	0.6	0.08
3	Akondo	<i>Calotropis gigantean</i>	57	32	2.28	0.11	14	24	0.56	0.07
4	Am	<i>Mangifera indica</i>	631	96	25.24	1.18	464	96	18.56	2.42
5	Amloki	<i>Embelica officinalis</i>	124	60	4.96	0.23	66	32	2.64	0.34
6	Amra	<i>Annona squamosa</i>	22	8	0.88	0.04	6	12	0.24	0.03
7	Asam lata	<i>Eupatorius odoratum</i>	4	16	0.16	0.01	14	56	0.56	0.07
8	Ata	<i>Spondias pinnata</i>	-	-	-	-	16	20	0.64	0.08
9	Babar sukh	Not found	1	4	0.04	0.00	-	-	-	-
10	Bamboo	<i>Bambusa spp.</i>	450	8	18	0.84	990	40	39.6	5.17
11	Banana	<i>Musa sapientum</i>	11150	84	446	20.94	3100	72	124	16.2
12	Basok	<i>Adhatoda vasica</i>	720	72	28.8	1.35	1343	60	53.72	7.01
13	Bel	<i>Aegle marmelos</i>	27	24	1.08	0.05	28	40	1.12	0.15
14	Bel beli	Not found	1	4	0.04	0.00	16	8	0.64	0.08
15	Beli	<i>Jasminum duplexss</i>	-	-	-	-	2	4	0.08	0.01
16	Bhadi	<i>Lannea coromandelica</i>	4	4	0.16	0.01	197	36	7.88	1.03
17	Bhat	<i>Clerodendrum viscosum</i>	45	8	1.8	0.08	300	28	12	1.57
18	Bohera	<i>Terminilia belerica</i>	163	36	6.52	0.31	84	40	3.36	0.44

19	Bondhona	<i>Scoparia dulcis</i>	5	20	0.2	0.01	15	60	0.6	0.08
20	Boroi	<i>Zizyphus mauritiana</i>	162	48	6.48	0.30	143	44	5.72	0.75
21	Chalta	<i>Dillenia indica</i>	1	4	0.04	0.00	4	16	0.16	0.02
22	Champa	<i>Michelia chappaca</i>	-	-	-	-	6	12	0.24	0.03
23	Chickrassi	<i>Chickrasia tabularis</i>	-	-	-	-	3	4	0.12	0.02
24	Dadmordon	<i>Cursia alata</i>	-	-	-	-	2	4	0.08	0.01
25	Dhakijam	<i>Syzygium grandis</i>	5	4	0.2	0.01	-	-	-	-
26	Dhan saprong	Not found	8	4	0.32	0.02	1	4	0.04	0.01
27	Dharmara	<i>Stereospermum personatum</i>	22	20	0.88	0.04	115	56	4.6	0.6
28	Dumur	<i>Ficus spp</i>	-	-	-	-	212	32	8.48	1.11
29	Fuljhumari/Itchri	<i>Anogeiss acuminata</i>	64	28	2.56	0.12	145	24	5.8	0.76
30	Gab	<i>Diospyros peregrina</i>	-	-	-	-	4	8	0.16	0.02
31	Gamar	<i>Gmelina arborea</i>	12724	96	508.96	23.89	1940	96	77.6	10.1
32	Garjon	<i>Dipterocarpus turbinatus</i>	7	4	0.28	0.01	71	8	2.84	0.37
33	Goda	<i>Vitex glabrata</i>	19	8	0.76	0.04	41	12	1.64	0.21
34	Gondhoraj	<i>Gardenia jasminodiess</i>	9	12	0.36	0.02	6	16	0.24	0.03
35	Guava	<i>Psidium guajava</i>	165	52	6.6	0.31	102	52	4.08	0.53
36	Gutgutia	<i>Protium serratum</i>	-	-	-	-	19	16	0.76	0.1
37	Horitoki	<i>Terminilia chebula</i>	3	8	0.12	0.01	-	-	-	-
38	Ipil-Ipil	<i>Leucaena leucocephala</i>	-	-	-	-	8	8	0.32	0.04
39	Jalpi	<i>Elaeocarpus robusta</i>	1	4	0.04	0.00	39	56	1.56	0.2
40	Jam	<i>Syzygium spp</i>	121	52	4.84	0.23	211	64	8.44	1.1
41	Jambura	<i>Citrus grandis</i>	320	64	12.8	0.60	56	52	2.24	0.29
42	Jarul	<i>Lagerstroemia speciosa</i>	1	4	0.04	0.00	1	4	0.04	0.01
43	Joba	<i>Hibiscus rosa-sinensis</i>	9	16	0.36	0.02	3	8	0.12	0.02
44	Kadom	<i>Anthocephalus chinensis</i>	-	-	-	-	2	4	0.08	0.01
45	Kalo basok	Not found	152	16	6.08	0.29	316	36	12.64	1.65
46	Kalomeg	<i>Andrographis paniculata</i>	730	44	29.2	1.37	1	4	0.04	0.01
47	Kamranga	<i>Averrhoa carambola</i>	1	4	0.04	0.00	-	-	-	-
48	Kanthal	<i>Artocarpus heterophyllus</i>	1969	100	78.76	3.70	1503	96	60.12	7.85
49	Karomcha	<i>Carssia carandus</i>	2	4	0.08	0.00	-	-	-	-
50	Katoki	Not found	-	-	-	-	33	20	1.32	0.17
51	Kear kata	<i>Pandanus kaida</i>	-	-	-	-	1	4	0.04	0.01
52	Khejur	<i>Phoenix sylvestris</i>	-	-	-	-	4	12	0.16	0.02
53	Koroi	<i>Albizia spp</i>	663	76	26.52	1.24	148	44	5.92	0.77
54	Kritolong	Not found	5	4	0.2	0.01	-	-	-	-

55	Lebu	<i>Citrus spp</i>	39	24	1.56	0.07	60	28	2.4	0.31
56	Lemon grass	<i>Cymbopogon citratus</i>	-	-	-	-	6	12	0.24	0.03
57	Litchi	<i>Litchi chinensis</i>	1312	88	52.48	2.46	327	72	13.08	1.71
58	Lotkan	<i>Baccaura ramiflora</i>	43	20	1.72	0.08	-	-	-	-
59	Maloti	<i>Aganosma dichotoma</i>	-	-	-	-	19	16	0.76	0.1
60	Medha	<i>Trewia polycarpa</i>	26	28	1.04	0.05	445	80	17.8	2.32
61	Mita bagun	<i>Solanum spp.</i>	-	-	-	-	14	16	0.56	0.07
62	Mogmah	Not found	1	4	0.04	0.00	-	-	-	-
63	Nagesshor	<i>Mesua nagesarium</i>	1	4	0.04	0.00	-	-	-	-
64	Narikel	<i>Cocos nucifera</i>	130	88	5.2	0.24	69	64	2.76	0.36
65	Nim	<i>Azadirachta indica</i>	75	80	3	0.14	50	56	2	0.26
66	Nisindha	<i>Vitex negundo</i>	10	12	0.4	0.02	-	-	-	-
67	Noli gash	Not found	8	8	0.32	0.02	-	-	-	-
68	Orange	<i>Citrus aurantium</i>	1073	36	42.92	2.01	4	12	0.16	0.02
69	Painna gula	<i>Ficus religiosa</i>	57	28	2.28	0.11	77	48	3.08	0.4
70	Papaya	<i>Carica papaya</i>	396	52	15.84	0.74	170	32	6.8	0.89
71	Pitha mul	<i>Trewia polycarpa</i>	-	-	-	-	4	8	0.16	0.02
72	Pobak gula	<i>Passiflora foetida</i>	2	8	0.08	0.00	-	-	-	-
73	Rangamila	Not found	31	16	1.24	0.06	25	16	1	0.13
74	Samalong gach	Not found	-	-	-	-	58	40	2.32	0.3
75	Saora	<i>Streblus asper</i>	39	12	1.56	0.07	45	8	1.8	0.23
76	Sarpo gondha	<i>Rouwolfia serpentina</i>	75	20	3	0.14	-	-	-	-
77	Shatomuli	<i>Asparagus racimosus</i>	105	8	4.2	0.20	6	8	0.24	0.03
78	Segun	<i>Tectona grandis</i>	16791	96	671.64	31.53	5016	100	200.64	26.2
79	Sofeda	<i>Manilkara sapotas</i>	2	4	0.08	0.00	-	-	-	-
80	Supari	<i>Areca catechu</i>	1789	80	71.56	3.36	69	44	2.76	0.36
81	Suruz	Not found	76	16	3.04	0.14	35	4	1.4	0.18
82	Tetua koro	<i>Albizia odoratissima</i>	377	48	15.08	0.71	205	24	8.2	1.07
83	Tetul	<i>Tamarindus indica</i>	15	24	0.6	0.03	9	12	0.36	0.05
84	Thankoni	<i>Centella asitica</i>	10	40	0.4	0.02	14	56	0.56	0.07
85	Tita bagun	<i>Solanum indicumss</i>	-	-	-	-	2	8	0.08	0.01
86	Toon	<i>Toona ciliata</i>	11	4	0.44	0.02	86	48	3.44	0.45
87	Treatlong	Not found	5	4	0.2	0.01	-	-	-	-
88	Tula	<i>Bombax ceiba</i>	11	4	0.44	0.02	36	12	1.44	0.19
89	Tulsi	<i>Ocimum sanctum</i>	47	28	1.88	0.09	223	32	8.92	1.16
90	Ulotkomble	<i>Abroma augusta</i>	79	36	3.16	0.15	68	24	2.72	0.36
Total			53255	-	2130.2	100	19151	-	766.04	100

Medicinal/Herbal plants

The survey result shows that people in the study area traditionally use different plants or herbs to get remedy from different diseases and as source of vitamins and energy. Table 8 lists the species that are most frequently used for different medicinal purposes available in their homesteads. Most commonly used plant species are Neem (80%), Basok (72%) and Amloki (60%) in Hazachara and Medha (80%), Basok (60%), Bondhona (60%), Asam lata (56%), Neem (56%) and Thunkoni (56%) in Mubachari village (Table 8). Photographs of some of the important medicinal plants are shown in Plate 1.

Table 8: List of medicinal plants and their uses in the study area.

Sl. No.	Species Name	Hazachara (% Homesteads)	Mubachari (% Homesteads)	Uses
1	Akondo	32	24	Rheumaticism
2	Amloki	60	32	Gastric, increase taste, Loose motion
3	Anaros	12	40	Kills worm
4	Asam lata	16	56	Stop bleeding
5	Babar sukh	4	-	Neck pain
6	Basok	72	60	Cough
7	Bel	24	40	Dyspepsia
8	Belbali	4	8	Abscess
9	Bhat	8	28	Stomach pain
10	Bohera	36	40	Trifola, Reduce blood pressure
11	Bondhona	20	60	Diabetes
12	Dadmordon	-	4	Dental disease
13	Dhan saprong	4	4	Cold/Cough
14	Dharmara	20	56	Jaundice
15	Goda	8	12	Jaundice
16	Horitoki	8	-	Trifola
17	Kalo basok	16	36	-
18	Kalomeg	44	4	Malaria
19	Karmocha	4	-	-
20	Katoki	-	20	-
21	Kear kata	-	4	Energetic
22	Kritolong	4	-	Herpes
23	Lemon grass	-	12	Cold/Cough
24	Medha	28	80	Energetic
25	Mitha bagun	-	16	Increase taste
26	Mogmah	4	-	Carbuncle
27	Neem	80	56	Skin disease
28	Nisindha	12	-	Jaundice
29	Noli gash	8	-	Hopping cough

30	Pobak gula	8	-	Body cool down
31	Rangamila	16	16	Jaundice
32	Samalong gach	-	40	Gangrene in throat
33	Sarpogondha	20	-	High pressure
34	Satomuli	8	8	Blister of tongue
35	Tetul	24	12	Reduce cholesterol, piles
36	Thunkoni	40	56	Dysentery
37	Tita bagun	-	8	Increase taste
38	Treatlong	4	-	Daud/ Skin disease
39	Tulsi	28	32	Cold/Cough
40	Ulotkomble	36	24	Energetic



Basok



Ulotkomble



Pobak gula



Bhat



Kalomeg



Sarpogandha

Plate 1: Important medicinal plants in the study area.

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 102.88 maund of fuel wood per year travelling 1.16 km distance from their homesteads (Table 9).

Table 9: Collection of forest resources from the hills owned or occupied by them.

Village Name	Fuel wood (Maund per year)	Distance (Km)
Hazachara (n= 25)	119.96	1.12
Mubachari (n=25)	85.80	1.20
Total (n= 50)	102.88	1.16

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 10 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 72 percent of the total activity followed by female member (s) (23%) and hired labour (male 4% and female 1%) in Hazachara village and 66 percent of activities are performed by the male followed by female (31%) and hired labour (male 3%) in Mubachari village. It is interesting to see that percentage of hired labor working in different agroforestry activities is very low in both the villages. It is also seen that women are particularly taking part at higher percentage in fruit harvesting (37%), nursing (36%) and product processing (34%) in Hazachara village and in nursing (44%), harvesting (37%), planning (36%) and choice of species (36%) in Mubachari village (Table 10). Overall, women in Mubachari (31%) are taking part in agro-forestry activities at greater percentage than Hazachara (23%)

Table 10: Distribution of labour (%) in homestead agro-forestry activities.

Agro-forestry activities	Hazachara (n = 25)				Mubachari (n = 25)			
	Male		Female		Male		Female	
	Own	Hired	Own	Hired	Own	Hired	Own	Hired
Planning	75	2	23	0	64	0	36	0
Choice of species	76	0	24	0	64	0	36	0
Seedling collection	74	6	19	2	66	3	30	1
Propagation	66	11	21	3	64	1	34	1
Planting	61	11	25	2	67	3	30	0
Nursing	59	4	36	1	53	3	44	0
Fertilizer application	67	0	33	0	57	0	43	0
Weeding	51	7	40	2	49	6	45	0

Harvesting	74	3	22	1	49	14	37	0
Trees	95	0	5	0	19	62	19	0
Fruits	60	2	37	1	50	4	45	1
Vegetables	68	2	30	0	47	4	49	0
Spices	54	11	33	2	50	0	50	0
Medicinal plants	96	0	4	0	80	0	20	0
Processing	61	4	34	1	65	2	33	0
Selling	100	0	0	0	100	0	0	0
Total (n = 50)	72	4	23	1	66	3	31	0

Lost Species

The homestead and hilly land survey tried to find out the species that are lost from the study area. The respondent households were asked to tell the names (s) of the lost species from their homesteads and hilly lands. It is found that respondents from Mubachari mentioned 19 and from Hazachara 17 timber, fruit, medicinal and herbal species that have already lost from their homesteads. Households in Hazachara responded that Garjan (64%), Civit (48%), Cogula (36%), Achargula (32%) and Telsur (20%) are the main species that are lost and in Mubachari Civit (52%), Garjan (52%), Telsur (32%), Cogula (20%) and Jaganna gula (20%) are the main species lost from their homesteads and hills (Table 11).

Table 11: List of lost species with their frequencies in the study area.

Sl. No.	Species Name	Hazachara (n= 25)	Mubachari (n= 25)	Total (n= 50)
1	Amloki	4	8	6
2	Arjun	8	12	10
3	Achargula	32	12	22
4	Bohera	12	16	14
5	Boilam	8	12	10
6	Caltha	4	4	4
7	Chorai gula	16	12	14
8	Civit	48	52	50
9	Cogula	36	20	28
10	Dup tree	20	16	18
11	Fuljhumari	12	8	10
12	Garjan	64	52	58
13	Goda	24	12	18
14	Gutgutia	-	12	6
15	Horitoki	8	4	6
16	Joganna gula	16	20	18
17	Kusum	12	16	14
18	Neem	-	16	8
19	Telsur	20	32	26

Causes of loss of species

The respondents were also asked to identify the causes of loss of plant species from their homesteads and hills. It is found that lack of awareness (62%), Jhum cultivation (50%) and less economic value (44%) are the major causes of species loss identified by the households of the study area (Table 12).

Difficulty faced due to loss of species

The respondents identified four difficulties they are facing due to loss of biodiversity from the locality. These are shortage of rainfall (42%), shortage of rural treatment (24%), more soil erosion (24%) and higher temperature (22%) (Table 12).

Consideration in planting tree species

The respondents also identified planting all types of species (76%) as the most important factor they will consider in planting trees followed by species which have more economic value (52%) and species which are needed for family use (20%) in and around their homesteads and hills (Table 12).

Table 12: Respondents' perception about loss of species, difficulty faced due to loss of species and consideration in planting trees.

Causes/Reasons for loss of species	Households responded	
	Frequency	Percentage
Jhum Cultivation	25	50
Less economic value	22	44
Lack of awareness	31	62
No replanting	2	4
Shortage of area	1	2
Natural calamity	2	4
More time required	3	6
Lack of rules and regulations	1	2
Lack of knowledge about use	2	4
Clear felling	11	22
Difficulty faced due to loss of species	Households responded	
	Frequency	Percentage
Shortage of rural treatment	12	24
Shortage of rainfall	21	42
Higher temperature	11	22

More soil erosion	12	24
Consideration in planting trees	Households responded	
	Frequency	Percentage
All type of species	38	76
All indigenous species	3	6
Species which are needed for family uses	10	20
Species which have more economic value	26	52

Uses of medicinal plants for family purposes

People in the study area are found to use medicinal or herbal plants for different purposes. It is seen that a total of 18 species were used in the study area. Table 13 lists those species with their purposes usually presently used by the households in the study area for different diseases or health problems from their homesteads. It is seen that Basok (72%) is the most commonly used medicinal species to get relief from cold or cough followed by Neem (48%) from skin diseases, Tulshi (36%) from cold or cough, Akonda (24%) from gastric, Kalomeg (20%) from malaria and Medha (20%) for energetic purposes (Table 13). Table 14 lists those species with their purposes the households usually used in the past but do not use now. Most common diseases for which they use or previously have used those plants are backbone or rheumatic pain, common cold or cough, stop bleeding, skin disease, dysentery, Jaundice, gastric, blood pressure, abscess, energetic purposes, etc. The respondent households were also asked to know whether they sell any medicinal plants or part of medicinal plants from their homesteads. It is seen that the responses for selling medicinal plants is very low (only 2-12%) and they earn on average 600 Taka/ year selling leaves of Basok, 500 Taka/year selling fruits of Amloki, 483 Taka/year selling bark of Medha and 20 Taka/year selling leaves of Neem (Table 15). The responded households were also asked to know the mode of marketing of medicinal plants from their homesteads. It is found that rural businessmen directly collect medicinal plants from their homes (58%) followed by rural medicinal practitioners (26%), middlemen collect from home (6%) and neighbours collecting from the homesteads for their own uses (2%) (Table 16)

Table 13: Common uses of medicinal plants by the respondent households for family treatment from their homesteads.

Sl. No.	Species	Households Responded (n= 50)		Used for
		Frequency	Percentage	
1	Akonda	12	24	Backbone pain/Rheumaticism
2	Amloki	2	4	Gastric
3	Asamlata	1	2	Stop bleeding
4	Basok	36	72	Cold/Cough
5	Belbali	1	2	Abscess
6	Bohera	2	4	Trifala

7	Bondhona	2	4	Diabetis
8	Dharmara	9	18	Jaundice
9	Goda	1	2	Jaundice
10	Kalomeg	10	20	Malaria
11	Lemaon grass	1	2	Cold/Cough
12	Medha	10	20	Energetic
13	Mitha Begun	2	4	Increase taste
14	Neem	24	48	Skin disease
15	Nishindha	5	10	Jaundice
16	Thankoni	10	20	Dysemtry
17	Tulshi	18	36	Cold/Cough
18	Ulotkamble	7	14	Energetic

Table 14: List of medicinal plants previously used for family purposes in the study area.

Sl. No.	Species	Households Responded (n= 50)		Uses
		Frequency	Percentage	
1	Akondo	14	28	Rheumatic pain
2	Amloki	4	8	Trifala/ Reduce blood pressure/ Gastric
3	Arjun	2	4	Reduce blood pressure
4	Arshogondha	2	4	Tetanus
5	Basok	14	28	Cold/Cough
6	Belbali	1	2	Abscess
7	Bohera	9	18	Trifala/ Reduce blood pressure
8	Horitaki	7	14	Trifala
9	Kalomegh	5	10	Malaria
10	Medha	2	4	Energetic
11	Neem	12	24	Skin disease
12	Nishinda	13	26	Jaundice
13	Rangamila	7	14	Jaundice
14	Shatomuli	1	2	Tongue disease
15	Thankuni	2	4	Dysentery
16	Tulshi	20	40	Cold/Cough

Table 15: List of medicinal species usually sold from homesteads in the study area.

Species	Households Responded		Taka/Year	Plant part sold
	Frequency	Percentage		
Amloki	1	2	500	Fruit
Bashok	2	4	600	Leaves
Neem	1	2	20	Leaves
Medha	6	12	483	Bark

Table 16: Distribution of respondent households by mode of marketing of medicinal plants.

Where do you sell your medicinal plants?	Households Responded	
	Frequency	Percentage
Rural medicinal practitioner	13	26
Rural business men collect from home	29	58
Middle men collect from home for supplying to herbal medicinal company	3	6
Neighbors collect for their own uses	1	2

Technical problems to plant medicinal species

The respondents of the study area were also asked whether they face any technical problems to plant medicinal species in their homesteads. The survey result shows that most of the respondents (60% in Hazachara and 84% in Mubachari) opined that they do not face any technical problem. Among the respondents who opined about facing problems mentioned that lack of proper knowledge (56%), does not know how to cultivate (36%) and does not know how to nurse (4%) medicinal plants are the problems they usually face in Hazachara village. On the other hand, does not know how to cultivate (16%) and lack of proper knowledge (4%) are the problems faced by the respondents in Mubachari village (Table 17).

Table 17: Technical problem(s) faced by households to plant medicinal species.

Problem		Hazachara (n=25)		Mubachari (n=25)	
		Households Responded	(%)	Households Responded	(%)
Face any problem	Yes	10	40	4	16
	No	15	60	21	84
	Total	25	100	25	100
Types of problem	Does not know how to cultivate	9	36	4	16
	Lack of proper knowledge	14	56	1	4
	Does not know how to nurse	1	4	0	0

Willingness to plant medicinal species for business purposes

The respondents of the study area were asked to know their willingness to plant medicinal species in their homesteads for business purposes if they are provided with technical and other support. It is found that all the households (100%) in both Hazachara and Mubachari are interested to plant medicinal species if they are provided with proper training and seedlings of medicinal species (Table 18). Households in Hazachara are found willing to assign more land (17

decimals) on average to plant medicinal species compared to Mubachari (9 decimals) (Table 18).

Table 18: Households’ interest to plant medicinal species for business purposes and available land area (values in the parentheses indicate percentages).

Items	Hazachara (n= 25)	Mubachari (n=25)	Total (n=50)
Interested to plant medicinal species if they are provided with training and seedlings			
Yes	25 (100)	25 (100)	50 (100)
No	0	0	0
Land area available (Decimals)	17	9	13

Social/Development organizations working in the study area

The study also tried to find out the organisations working in both Hazachara and Mubachari for social and/or other development. It is found that there are only 4 government approved nongovernmental organizations (NGOs) working in the study area for different kinds of activities (Table 19). The organizations working in the study area are BRAC, Krishi Bank, UNDP, SUS. The activities by these NGOs include mainly loan and social development.

Table 19: NGOs’ involvement in community development.

NGOs	Hazachara		Mubachari		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
BRAC	1	4	1	4	2	4
Krishi Bank	2	8	14	56	16	32
UNDP	-	-	2	8	2	4
SUS	1	4	-	-	1	2

Conclusion:

Finally, it can be said that the people of the study area are mainly dependent on agro-forestry products earning 78% of their total family income (Table 6) from their homesteads. They have rich biodiversity in their homesteads and hills (Tables 7 & 8). They are also using some plant species as remedy for different diseases or health problems (Table 13). The community people have got enough hilly lands and homestead lands (Table 1) to plant trees and produce agricultural crops or spices and medicinal plants. But they are not that much aware to replant or restore the species they are destroying through jhum or other planting methods to meet their daily necessities. In doing so they are destroying the biodiversity of the homesteads and hilly areas (Tables 11 & 14). 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 especially for medicinal species as they are facing problems like shortage of fruit and medicines and they need more money to buy medicines, and other plant products etc. So they are now interested to plant and restore their homestead biodiversity with those species which will be useful for their family purposes and earn extra income for the family. 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 medicinal or herbal plant resources.