

Baseline Survey Report

Name of the project

Restoration and Conservation of Biodiversity in the Denuded
Hills of Banskali, Chittagong

Implementing entity

Dhaka Ahsania Mission
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 **“RESTORATION AND CONSERVATION OF BIODIVERSITY IN THE DENUDED HILLS OF BANSKHALI, CHITTAGONG”** implemented by **Dhaka Ahsania Mission**, partner NGO of Arannayk Foundation. The survey was designed to observe the current status of the biodiversity resources in homesteads of the project participants and as well as in the neighbouring reserve forests. The denuded hills of Bashkhali are a part of the Arakan Range that spreads from Cox’s Bazar in the south to Sylhet in the North. Once covered with thick Garjon and other native tree species like Amloki, Bohera, Chapalish, Dharmara, Dewe, as well as medicinal plants like Ulot Kombal and Tokma the hills are now totally denuded due to severe human intervention. Presently, the hills are covered by bush of mitinga bamboos and other bushy undergrowth and within the undergrowth many of the above tree species regenerate profusely but can hardly mature since poor people from surrounding villages and coastal areas while collecting minor forest products such as fuel wood, bamboos, sun grass, broom grass and medicinal plants destroy those. The present project covers only 190 ha of Shadhanpur Beat under Kalikapur Range of Chittagong South Forest Division. The total efforts will be directed towards making people understand the positive consequences of regeneration of the forest cover, and the impacts such eco-balance will have on their lives and livelihoods. What is required is to get the green cover back in the denuded hills through people’s participation, creation of alternative livelihood opportunities for the forest dependent people, prevention of forest fire and making people proactive in forest protection. The project initially assumed that homesteads are getting divided due to vast population growth. At the same time people are setting up new habitations by destroying natural forests and local kinds of trees. Most of the inhabitants live beside the forest areas and a good number of people are directly and indirectly dependent on the forest resources. They use forest fuel woods, cultivate forest land and use other forest resources in many ways. The main problem was the destruction of the naturally regenerated woody plants at young stage by trespassers (fuel wood collectors) and forest fire. Fire is normally set by people for clearing land for raising sun grass and other short-term benefits. As a result biodiversity of the forests are decreasing day by day. In this connection the proposed base line survey tried to gather information on the current status of the homestead and neighbouring forests to which rural people depend for their timber, fuel and income. The survey also tried to appraise the biodiversity of both the forests. Current stock of the forests and peoples’ dependence on forests was also assessed.

Objectives of the baseline survey:

- To assess the socioeconomic conditions of the people living in the study area.
- To identify the biodiversity available in the homesteads and forests of the study area.
- To identify the lost/endangered biodiversity from homesteads and forests.

Methodology of the baseline survey:

The baseline survey was conducted at the homesteads and neighbouring hill forest areas of the proposed project area of Dhaka Ahsania Mission at Shadhanpur Beat under Kalikapur Range of Chittagong South Forest Division to assess the forest resources, households' economic status, their dependence on forest resources & agricultural products and gender role in agro-forestry practices. The present project covers only 190 ha of Shadhanpur Beat. The baseline survey was conducted in two phases. First, a homestead survey was conducted with a pre-structured questionnaire in the study area (Photo 1). A total of 50 households were surveyed from three villages neighbouring Shadhanpur beat namely, **Boilgao** (n=26), **Banigram** (n=10) and **Shadhanpur** (n=14) from where project participants will be selected by Ahsania Mission, Dhaka. The head of each selected household was interviewed to gather required information. Then a forest survey was conducted by passing through the neighbouring forest areas of Shadhanpur Beat with a group of experts to identify and list the plant species present in the forests. A total of 10 sample plots of 10mX10m were also taken randomly in the forests to measure the growing stock of the forest and in each sample plot 4 subplots of 2mX2m were taken to identify the regeneration status of the forests. The collected data were analyzed and presented in the result section.



Photo 1: Homestead surveys in the study area [(a) Questionnaire survey and (b) Typical homestead with trees and house].

Results:

Part I: Homesteads survey

Respondents' age, sex and education level

The result of the household survey (Photo 1) shows that the average age of the respondent is 41 years and they are most responsible person of the community. Among the respondents most of them are male (92%) (Table 1). Educational status of the respondents' show that more than half of the respondents are literate (52%) having mainly primary (28%) and secondary (16%) level education and the rest (48%) are illiterate. Only one respondent (2%) in Shadhanpur village was found having graduate level education. It shows the poor level of education in the study area. However, literacy rate was found higher in Shadhanpur village (57%) and lower in Banigram (40%) (Table 1). Analysis of the respondents' occupation shows that most of the families are engaged in labour (40%) and other category (28%) of occupation including carpenter, fishermen, village doctor and housewife (54%) followed by service (16%), business (10%) and agriculture (6%) as primary occupation. Few respondents (10%) are also found involved in secondary occupation that includes agriculture (8%) followed by labour (2%) (Table 2). However, all of the respondent households mainly by the female members of the family are found to collect fallen leaves, twigs, fire wood, broom sticks and sungrass (thatching material) from the nearby forest (Photo 2) to use as fuel or other purposes and/or sell in the market. This really shows the severity of dependency of the local people on the forests.

Table 1: Distribution of respondent households by respondents' age, sex and educational level (Note: M= Male; F= Female; Illit.= Illiterate; Pri.= Primary; Sec.= Secondary; S.S.C.= Secondary School Certificate; H.S. C.= Higher Secondary Certificate; Grad.= Graduate) (values in the parentheses denote percentages).

Village	Age	Sex			Education						
		M	F	Total	Illit.	Pri.	Sec.	S.S.C.	H.S.C.	Grad.	Total
Boilgao (n=26)	40	23 (46)	3 (6)	26 (52)	12 (46)	10 (38)	4 (15)	-	-	-	26 (100)
Banigram (n=10)	39	9 (18)	1 (2)	10 (20)	6 (60)	1 (10)	2 (20)	1 (10)	-	-	10 (100)
Shadhanpur (n=14)	46	14 (28)	-	14 (28)	6 (43)	3 (21)	2 (14)	2 (14)	-	1 (7)	14 (100)
Total (n=50)	41	46 (92)	4 (8)	50 (100)	24 (48)	14 (28)	8 (16)	3 (6)	-	1 (2)	50 (100)

Table 2: Distribution of respondent households by occupation (Note: Agri.= Agriculture; Ser.= Service; Busi.= Business; Lab.= Labour; Oth.= Other) (values in the parentheses denote percentages).

Village	Primary Occupation						Secondary Occupation					
	Agri.	Ser.	Busi.	Lab.	Oth.	Total	Agri.	Ser.	Busi.	Lab.	Oth.	Total
Boilgao (n=26)	-	2 (8)	2 (8)	14 (54)	8 (31)	26 (100)	1 (4)	-	-	-	-	1 (4)
Banigram (n=10)	1 (10)	2 (20)	2 (20)	1 (10)	4 (40)	10 (100)	-	-	-	-	-	-
Shadhanpur (n=14)	2 (14)	4 (29)	1 (7)	5 (36)	2 (14)	14 (100)	3 (21)	-	-	1 (7)	-	4 (29)
Total (n=50)	3 (6)	8 (16)	5 (10)	20 (40)	14 (28)	50 (100)	4 (8)	-	-	1 (2)	-	5 (10)

(a)



(b)



(c)



(d)



Photo 2: Collection of forest resources by women in the study area (a) two women carrying fire wood and broom sticks on their head load (b) a woman carrying broom sticks (c) stock of

sungrass and fire wood collected from forest and (d) a sac of fallen leaves and twigs collected from the forest floor.

Family size, sex and earning member

Average family size in the study area is 5.28 of which majority of them are male (51%) and the rest (49%) are female (Table 3). Among the family members most of them were found in the younger age category of 0-30 years (72%). On average each family has 1.38 (26% of the total family size) earning members of which 1.24 are male (23% of the total family size) and 0.14 are female (3% of the total family size) (Table 3). This result shows that male members of the family are mostly the earning members. However, women and children are found to engage themselves in the collection of leaves, fuel wood, broom sticks, sungrass and other resources from the neighbouring forests (Photo 2).

Table 3: Distribution of respondent households by family size, sex and total earning members (Note: M= Male; F= Female; T= Total) (values in the parentheses denote percentages).

Village	<10		10-20		20-30		30-40		40-50		>50		Total			Earning members		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	T	M	F	T
Boilgao (n=26)	0.73 (13)	1.35 (24)	0.62 (11)	0.62 (11)	0.46 (8)	0.54 (10)	0.50 (9)	0.23 (4)	0.19 (3)	0.15 (3)	0.23 (4)	-	2.73 (49)	2.88 (51)	5.62 (100)	1.15 (21)	0.15 (3)	1.31 (23)
Banigram (n=10)	0.60 (13)	0.70 (15)	0.40 (8)	0.50 (10)	0.40 (8)	0.70 (15)	0.60 (13)	0.30 (6)	0.30 (6)	0.10 (2)	0.10 (2)	0.10 (2)	2.40 (50)	2.40 (50)	4.80 (100)	1.30 (27)	0.10 (2)	1.40 (29)
Shadhanpur (n=14)	0.57 (11)	0.86 (17)	0.93 (19)	0.29 (6)	0.43 (9)	0.29 (6)	0.14 (3)	0.36 (7)	0.36 (7)	0.36 (7)	0.43 (9)	-	2.86 (57)	2.14 (43)	5.00 (100)	1.36 (27)	0.14 (3)	1.50 (30)
Total (n=50)	0.66 (13)	1.08 (20)	0.66 (13)	0.50 (9)	0.44 (8)	0.50 (9)	0.42 (8)	0.28 (5)	0.26 (5)	0.20 (4)	0.26 (5)	0.02 (0.4)	2.70 (51)	2.58 (49)	5.28 (100)	1.24 (23)	0.14 (3)	1.38 (26)

Land resources

Land resources occupied by each family in the study area is only 20.62 decimals of which most of the lands are homestead land (65%) followed by agricultural land (34%) and bamboo or tree areas (1%) (Table 4). Each household in Shadhanpur vilage was found to have comparatively more land resources (37.71 decimals) of which most of the land are used for agricultural purposes (59%). On the other hand each household in Banigram village was found to have less land resources (5.80 decimals) of which the total land is used for homestead purposes (100%) without having any agricultural land (Table 4).

Table 4: Distribution of respondent households by land resources (in decimals) (Note: DU= Dwelling unit; AS= Animal shed; Agri.= Agricultural land; Bam.= Bamboo areas) (values in the parentheses denote percentages).

Village	Homestead							Agri.	Bam.	Tree/ bush	Total land
	DU	Trees	AS	Yard	Pond	Others	Total				
Boilgao (n=26)	4.23 (25)	8.12 (47)	0.54 (3)	1.81 (11)	-	0.88 (5)	15.58 (91)	1.54 (9)	-	-	17.12 (100)
Banigram (n=10)	3.2 (55)	1.3 (22)	0.2 (3)	0.9 (16)	0.2 (3)	-	5.80 (100)	-	-	-	5.80 (100)
Shadhanpur (n=14)	3.6 (9)	6.0 (16)	0.6 (2)	2.6 (7)	0.1 (0.4)	1.9 (5)	14.79 (39)	22.3 (59)	0.3 (1)	0.4 (1)	37.71 (100)
Total (n=50)	3.84 (19)	6.16 (30)	0.48 (2)	1.84 (9)	0.08 (0.4)	1 (5)	13.40 (65)	7.04 (34)	0.08 (0.4)	0.1 (0.5)	20.62 (100)

Family income

Analysis of the family income of the respondent households' shows that average family income in the study area is 61373 Taka/year of which higher amount of income (50%) comes from daily labour followed by service (18%) and other category (13%) (Table 5). However, average family income was found much higher in Shadhanpur (75843 Taka/year) which is mainly due to their involvement in service (31%) and agriculture (10%) along with daily labour (42%) compared to other villages. However, the respondent households were found to earn most of their income from daily labour (Table 5).

Table 5: Distribution of households' family income (Taka/year) in the study area (Note: AP= Agricultural products; TP= Tree products) (values in the parentheses denote percentage of total income)

Village	AP	TP	Labour	Service	Business	Others	Total
Boilgao (n=26)	1042 (2)	2327 (4)	32577 (63)	2769 (5)	3692 (7)	9637 (19)	52045 (100)
Banigram (n=10)	4070 (6)	4500 (7)	25000 (38)	15600 (24)	8400 (13)	7800 (12)	65370 (100)
Shadhanpur (n=14)	7771 (10)	3000 (4)	32143 (42)	23143 (31)	5143 (7)	4643 (6)	75843 (100)
Total (n=50)	3532 (6)	2950 (5)	30940 (50)	11040 (18)	5040 (8)	7871 (13)	61373 (100)

Plant diversity

Table 6 list the plant species and the plant diversity measures present in the homesteads of the study area. A total of 26 different plant species were found in the homesteads of the study area (Tables 6). Among plant diversity different timber, fruit and medicinal species are found growing. It is evident that **Am** (70%), **Kantal** (70%), **Akashmoni** (60%), **Narikel** (28%) and **Supari** (28%) were found dominating in the homesteads of the study area (Table 6). Total species density was found 243.67 in the study area which is a matter of great concern from biodiversity conservation point of view. In case relative density highest percentage was also observed for **Akashmoni** (22.22) followed by **Patipata** (13.68), **Mahogoni** (11.08) and **Mangium** (8.54) in the study area (Table 6).

Table 6: Analysis of the plant diversity present in the study area (Note: Nos.= Number of trees/culms; HH%= Percentage households)

Sl. No.	Species name	Scientific name	Frequency		Species density	Relative density (%)
			Nos.	HH%		
1	Akasmoni	<i>Accacia auriculiformis</i>	1624	60	54.13	22.22
2	Am	<i>Mangifera indica</i>	163	70	4.66	1.91
3	Amloki	<i>Phyllanthus emblica</i>	1	2	1.00	0.41
4	Banana	<i>Musa sapientum</i>	69	12	11.50	4.72
5	Bhadi	<i>Gariga pinnata</i>	2	2	2.00	0.82
6	Boroi	<i>Zizyphus mauritiana</i>	22	20	2.20	0.90
7	Chapalish	<i>Artocarpus chaplasha</i>	3	6	1.00	0.41
8	Eucalyptus	<i>Eucalyptus camaldulensis</i>	157	26	12.08	4.96
9	Gamar	<i>Gmelina arborea</i>	1	2	1.00	0.41
10	Guava	<i>Psidium guajava</i>	93	16	11.63	4.77
11	Jam	<i>Syzygium cumini</i>	15	12	2.50	1.03
12	Jolpai	<i>Elaeocarpus floribundus</i>	4	4	2.00	0.82
13	Kamranga	<i>Averrhoa carambola</i>	1	2	1.00	0.41
14	Kanthal	<i>Artocarpus heterophyllus</i>	494	70	14.11	5.79
15	Lebu	<i>Citrus spp.</i>	13	16	1.63	0.67
16	Litchi	<i>Litchi chinensis</i>	30	18	3.33	1.37
17	Mahagoni	<i>Swietenia mahagoni</i>	135	10	27.00	11.08
18	Mangium	<i>Acacia mangium</i>	229	22	20.82	8.54
19	Narikel	<i>Cocos nucifera</i>	61	28	4.36	1.79
20	Papaya	<i>Carica papaya</i>	35	8	8.75	3.59
21	Raintree	<i>Albizia saman</i>	2	4	1.00	0.41
22	Segun	<i>Tectona grandis</i>	2	2	2.00	0.82
23	Shimul	<i>Bombax cieba</i>	1	2	1.00	0.41
24	Supari	<i>Areca catechu</i>	93	28	6.64	2.73
25	Bamboo	<i>Bambusa spp.</i>	39	6	13.00	5.34
26	Patipata	<i>Schumannianthus dichotoma</i>	100	6	33.33	13.68
Total			3389	-	243.67	100

Income from tree and agricultural products

The respondents in the study area were asked to know the cost and benefit from plant products grown by them annually. The respondent households earn some money from selling fruits and also grow some crops and vegetables for their own use and to get some extra income in their homesteads and agricultural lands. It is found that on average each family earns a total net benefit of 1015 Taka/year from plant and agricultural products including fruits (80 Taka/year), and vegetables (935 Taka/year) (Table 7).

Table 7: Distribution of respondent households by income from plant and agricultural products (Taka/year/household) grown by them (Note: Ct= Cost; Bt= Benefit; NB= Net benefit).

Village	Fruits			Vegetables			Total		
	Ct	Bt	NB	Ct	Bt	NB	Ct	Bt	NB
Boilgao (n=26)	8	162	154	642	1538	896	650	1700	1050
Banigram (n=10)	-	-	-	405	1020	615	405	1020	615
Shadhanpur (n=14)	-	-	-	586	1821	1236	586	1821	1236
Total (n=50)	4	84	80	579	1514	935	583	1598	1015

Collection of forest resources

The respondent households were asked to know the type of forest resources they usually collect from the neighbouring forests. It is observed that respondent households usually collect fallen leaves, dead branches and twigs, fuel wood, sungrass and broom sticks from the forest. Most of the respondent households (92%) in the study area were found to collect 103 maunds of fuel wood per year from the forests travelling a distance of 1.17 kilometres. They usually spend about 3.26 hours a day on average in collecting forest resources. However, the people of Boilgao and Banigram collect more fuel wood (113 maunds per year) compared to Shadhanpur village (77 maunds per year) collect fuel wood or fallen leaves from the neighbouring forests (Table 8).

Table 8: Distribution of respondent households by the collection of forest resources (values in the parentheses represent percentage households responded).

Village	Fuel wood (Maund)	Distance (km)	Time spent (Hour/day)
Boilgao (n=26)	113 (96)	1.29	3.35
Banigram (n=10)	113 (100)	1.00	3.70
Shadhanpur (n=14)	77 (79)	1.07	2.79
Total (n=50)	103 (92)	1.17	3.26

Lost Species

The homestead survey tried to find out the species that are lost from the homesteads and forest areas of the study area. The respondent households were asked to identify the name(s) of the lost species from their homesteads and forests. It is found that a total of 14 tree species were identified by the respondents of the study area that were lost from the locality. Among the lost species **Garjan** (42%), **Bohera** (26%), **Chapalish** (26%) and **Segun** (18%) are the mostly answered plant species that are lost from the study area (Table 9).

Table 9: Frequency distribution of respondents' perception about lost species in the study area (Note: HH= Number of households responded).

Sl. No.	Species name	Scientific name	HH	%
1	Amloki	<i>Phyllanthus embelica</i>	1	2
2	Arjun	<i>Terminalia arjuna</i>	2	4
3	Batna	<i>Quercus</i> spp.	6	12
4	Bel	<i>Aegle marmelos</i>	1	2
5	Bohera	<i>Terminalia belerica</i>	13	26
6	Chapalish	<i>Artocarpus chaplasha</i>	13	26
7	Chatim	<i>Alostonia scholaris</i>	4	8
8	Garjan	<i>Dipterocarpus turbinatus</i>	21	42
9	Goda	<i>Vitex glabrata</i>	3	6
10	Gutguttiya	<i>Protium serratum</i>	1	2
11	Kat badam	<i>Terminalia catappa</i>	1	2
12	Kau gula	<i>Garcinia cowa</i>	1	2
13	Segun	<i>Tectona grandis</i>	9	18
14	Tula	<i>Bombax ceiba</i>	1	2

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 cut for building houses (46%) and fire (20%) set by the villagers for clearing spaces to grow sungrass are the noticeable causes of biodiversity loss in the study area (Table 10). The respondent households were also identified a lot of problems they are facing due to biodiversity loss from the study area. Most of them (50%) answered that they face problems due to biodiversity loss (Table 10). Some of the mentionable problems identified by the respondents of the study area are less rain fall (30%) and land slide (10%) (Table 10).

Consideration for biodiversity conservation

Most of the respondents answered that they will consider all types of species (56%) and some of them will consider those species having more economic value (24%) and species needed for family use (22%) when they were asked to mention their consideration for planting trees (Table 10). Most of the respondents (80%) also answered that they do not face any problem of technical knowledge for planting trees and most of them (84%) haven't even got any training about biodiversity conservation (Table 10)

Table 10: Frequency distribution of respondent households by the reason (s) and difficulty faced for biodiversity loss and recommendation for biodiversity conservation in the study area (Note: HH= households responded).

Reasons, difficulties and recommendations	Respondents' opinion	HH	%
Reasons for biodiversity loss/lost species from the homesteads or forests	Population pressure	7	14
	Lack of money	1	2
	Fuel wood	1	2
	Fire	10	20
	Cut for building houses	23	46
Difficulty occurred due to Biodiversity loss	Yes	25	50
	NO	6	12
	No response	19	38
Types of difficulties occurred due to biodiversity loss	Land slide	5	10
	Less rain fall	15	30
	Flood & cyclone	4	8
	Scarcity of fuel wood	1	2
Consideration for planting trees	All types all species	28	56
	Species which are needed for family uses	11	22
	All indigenous species	7	14
	Species which have more economic value	12	24
Face any problem of technical knowledge for planting trees	Yes	10	20
	No	40	80
Got any training for planting trees or biodiversity conservation	Yes	8	16
	No	42	84

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 9 government approved nongovernmental organizations (NGOs) working in the study area for providing loans to the community people (Table 11). A total of 106% respondent households in the study area responded that they became members of the NGOs listed to get loan. The percentage shown here is more than 100% which is due to some of the households having involved with more NGOs. IDF (24%) is the important NGOs working in the study area. Some of the mentionable NGOs are Grameen Bank (16%), DROP (16%), BRAC (14%), BRDB (12%) and Uddipon (12%) (Table 11).

Table 11: Distribution of NGOs activity in the study area.

NGOs	Boilgao (n=26)	Banigram (n= 10)	Shadhanpur (n= 14)	Total (n=50)
IDF	10 (38)	-	2 (14)	12 (24)
BRAC	6 (23)	-	1 (7)	7 (14)
Grameen Bank	2 (8)	4 (40)	2 (14)	8 (16)
Prattashy	3 (12)	-	-	3 (6)
DROP	4 (15)	2 (20)	2 (14)	8 (16)
ASA	2 (8)	-	-	2 (4)
BRDB	6 (23)	-	-	6 (12)
Uddipon	1 (4)	2 (20)	3 (21)	6 (12)
Islamia	-	-	1 (7)	1 (2)
Total	34 (131)	8 (80)	11 (79)	53 (106)

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 12 shows the different agro-forestry activities in the homesteads with the labour involvement based on sex. It is found that both male and female member(s) of the household are performing most of the activities where male (57%) and female (43%) perform the total agro-forestry activities in the study area (Table 12). It

is observed that female members of the family usually do more or less equal work in agro-forestry activities (Table 12).

Table 12: Distribution of labour (%) in homestead agro-forestry activities.

Activities	Sex	Village			
		Boilgao (n=26)	Banigram (n=10)	Shadhanpur (n=14)	Total (n=50)
Planning	Male	55	51	51	53
	Female	45	49	49	47
Choice of species	Male	53	50	51	52
	Female	47	50	49	48
Seedling collection	Male	53	50	51	52
	Female	47	50	49	48
Propagation	Male	53	50	51	52
	Female	47	50	49	48
Planting	Male	53	50	51	52
	Female	47	50	49	48
Nursing	Male	53	50	51	52
	Female	47	50	49	48
Fertilizer application	Male	53	50	51	52
	Female	47	50	49	48
Weeding	Male	53	50	51	52
	Female	47	50	49	48
Harvesting	Male	53	50	51	52
	Female	47	50	49	48
Trees	Male	53	50	51	52
	Female	47	50	49	48
Fruits	Male	53	50	51	52
	Female	47	50	49	48
Vegetables	Male	53	50	51	52
	Female	47	50	49	48
Spices	Male	53	50	51	52
	Female	47	50	49	48
Medicinal plants	Male	53	50	51	52
	Female	47	50	49	48
Processing	Male	53	50	51	52
	Female	47	50	49	48
Selling	Male	100	100	100	100
	Female	-	-	-	-
Total	Male	58	56	57	57
	Female	42	44	43	43

Part II- Forest Survey:

Forest survey was conducted in Shadhanpur beat to know the present stock and regeneration status of the forests. It was done by walking through the hill forest areas with a group of experts and identifying and observing the species found in the forests and also identifying the regeneration status on the forest floor. Local people living in or around the forests were found poor and very much dependent on forest resources. They are mostly daily labourer and forest resource collectors. They usually collect fuel wood, fallen leaves and other resources including broom sticks, sungrass from the forests (Photo 2) which they use for their cooking, floor cleaning and thatching purposes and also sell in the market to earn extra income. The forests seem very much denuded (Photo 3c) with some short and long rotation plantations (Photos 3a and 3b) by the Forest Department in participatory forestry programmes with benefit sharing agreement. However some people were also found to occupy forest lands inside the reserve forest areas and established homesteads there. They plant trees and grow agricultural crops on the hill slopes. The random sampling procedure to know the growing stock of the forests reveals that there are on average 1261 stems per hectare in the forest. The forest stockings (stems/ha) is not too good for both the plantation and natural forests. Among different tree species found in the forests **Akashmoni** (67%) was found dominating followed by **Eucalyptus** (56%), **Gamar** (28%), **Mangium** (28%) and **Khantal** (28%) (Table 13). Species density was found higher for **Akashmoni** (44) followed by **Eucalyptus** (33), **Mangium** (21) and **Khantal** (20). Relative density was also found higher for **Akashmoni** (21) followed by **Eucalyptus** (16), **Mangium** (10) and **Khantal** (10) (Table 13). Most of the trees found in the forests are planted by the Forest Department. Only some scattered naturally grown plant species were found in the forests. The regeneration status of the forests was also found very poor having only 854 seedlings per hectare of which **Akashmoni** (51%) is the dominating one followed by **Civit** (17%), **Jam** (16%) and **Garjan** (16%) (Table 14). Akashmoni, Mangium, Garjan, Kat badam, Eucalyptus, Mahagoni, Bohera, Gamar, Buddo narikel, Chalta, Jalpai, Gab and Segun are found growing in the forests. Among other plants Boroi, Lodi kata, Keya kata, Bet, Fuljaru, Achargula, Tea indicator, Tejbohor. Lazzabati, Bhat, Asam lata, Kalmi lata, Khargo lata, Potong gula, Tomka, Minjiri, Sun grass, Bamboo etc. were found in and around the forests (Table 15, Photo 3). Kanok, Goda, Chapalish, Dharmara, Barta, Amloki, Horitoki, Painnagola, Batna, Lotkon, Chatian, Arhor and Civit are some of the plant species that were lost from the forests according to the local people (Table 15). Among wildlife Common birds, Wild bore, Elephant, Fox, Rabbit, Porcupine, Bon morog, Common snakes, Meso bagh are usually seen by the local people which are decreasing in numbers gradually in and around the forests of the study area. However, it was home of Honuman, Monkey, Peacock, Ram kukur and Deer in the recent past (Table 15). So interventions from both the government and the non-government initiatives in this respect has become urgent to restore these important forest resources by keeping the forest undisturbed at least for some period of time, make the local people aware about the resource depletion and creating alternative income generating opportunities for the community people to help support their livelihood.

Table 13: Species distribution and analysis of the plant diversity present in Banskhali Hill Forests

Sl. No.	Species name	Frequency		Species density (Stems/ha)	Relative density (%)
		Stems/ha	%		
1	Akashmoni	533	67	44	21
2	Eucalyptus	328	56	33	16
3	Champa	6	6	6	3
4	Garjan	11	11	6	3
5	Gamar	44	28	9	4
6	Mangium	106	28	21	10
7	Kanthal	100	28	20	10
8	Kau	28	11	14	7
9	Chapalish	6	6	6	3
10	Mahagoni	28	11	14	7
11	Am	11	11	6	3
12	Dhaki jam	11	6	11	5
13	Kat Badam	6	6	6	3
14	Jam	44	17	15	7
Total		1261	-	209	100

Table 14: Regeneration status of Banskhali Hill Forests

Species name	Seedlings/ha	Percentage (%)
Akashmoni	433	51
Civit	143	17
Jam	139	16
Garjan	139	16
Total	854	100

Table 15: List of plants and wildlife in Banskhali Hill Forests.

Major species	Other plants	Lost species	Wildlife			
			Present	5 years	10 years	15 years
Akashmoni, Mangium, Garjan, Kat badam, Eucalyptus, Mahagoni, Bohera, Gamar, Buddo narikel, Chalta, Jalpai, Gab, Segun, etc.	Got boroj, Lodi kata, Keya kata, Bet, Fuljaru, Achargula, Tea indicator, Tejbohor. Lazzabati, Bhat, Asam lata, Kalmi lata, Khargo lata, Potong gula, Tomka, Choto minjiri, Sun grass, Bamboo, etc.	Kanok, Goda, Chapalish, Dharmara, Barta, Amloki, Horitoki, Painnagola, Batna, Lotkon, Chatian, Arhor, Civit, etc.	Common birds, Wild bore, Elephant, Fox, Rabbit, Porcupine, Bon morog, Snake, Meso bagh	Honuman, Monkey	Peacock, Ram kukur	Deer

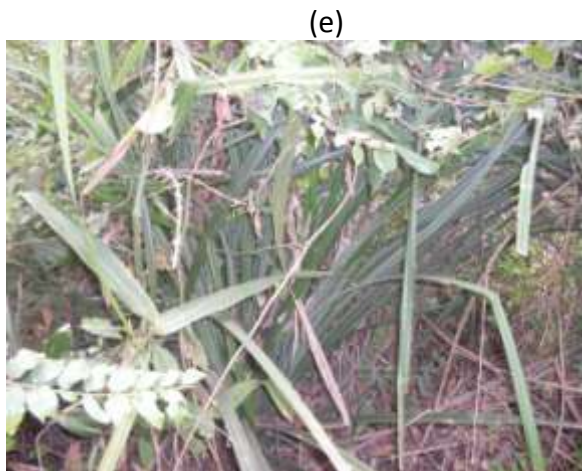
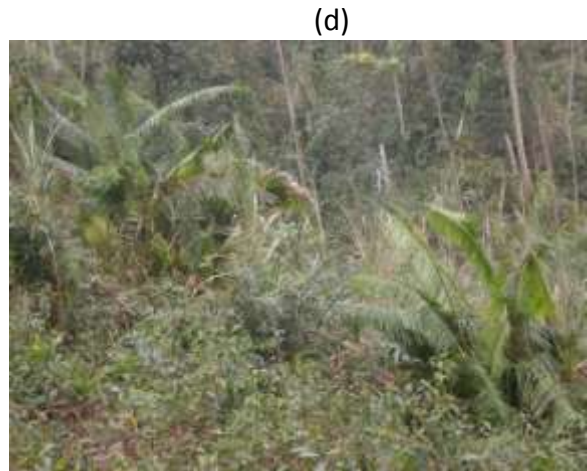


Photo 3: Status of Shadhanpur reserve forests [(a) Eucalyptus plantation; (b) Akashmoni plantation; (c) denuded forests; (d) Bet and other undergrowth; (e) Keya kata and (f) regeneration of Jam and others].

Conclusion:

Finally, it can be said that the people of the study area are mainly dependent on daily labour (with 50% of total family income) and forest resource collection from the neighbouring forests (Tables 5, 7 & 8). **Am** (70%), **Kantal** (70%), **Akashmoni** (60%), **Narikel** (28%) and **Supari** (28%) were found dominating in the homesteads of the study area (Table 6). Species density was found higher for **Akashmoni** (54.13) followed by **Patipata** (33.33), **Mahogoni** (27.00) and **Mangium** (20.82) in the study area (Table 6). Total species density was found 243.67 in the study area which is a matter of great concern from biodiversity conservation point of view. In case relative density highest percentage was also observed for **Akashmoni** (22.22) followed by **Patipata** (13.68), **Mahogoni** (11.08) and **Mangium** (8.54) in the study area (Table 6). It is found that on average each family earns a total net benefit of 1015 Taka/year from plant and agricultural products including fruits (80 Taka/year), and vegetables (935 Taka/year) (Table 7). Most of the respondent households (92%) in the study area were found to collect 103 maunds of fuel wood per year from the forests travelling a distance of 1.17 kilometres. They usually spend about 3.26 hours a day on average in collecting forest resources (Table 8). A total of 14 tree species were identified by the respondents of the study area that were lost from the locality. Among the lost species **Garjan** (42%), **Bohera** (26%), **Chapalish** (26%) and **Segun** (18%) are the mostly answered plant species that are lost from the study area (Table 9). It is found that cut for building houses (46%) and fire (20%) set by the villagers for clearing spaces to grow sungrass are the noticeable causes of biodiversity loss in the study area (Table 10). The respondent households were also identified a lot of problems they are facing due to biodiversity loss from the study area. Most of them (50%) answered that they face problems due to biodiversity loss (Table 10). Some of the mentionable problems identified by the respondents of the study area are less rain fall (30%) and land slide (10%) (Table 10). Most of the respondents answered that they will consider all types of species (56%) and some of them will consider those species having more economic value (24%) and species needed for family use (22%) when they were asked to mention their consideration for planting trees (Table 10). Most of the respondents (80%) also answered that they do not face any problem of technical knowledge for planting trees and most of them (84%) haven't even got any training about biodiversity conservation (Table 10). Majority of the respondent households in the study area responded that they became members of the NGOs listed to get loan (Table 11). It is found that both male and female member(s) of the household are performing most of the activities where male (57%) and female (43%) perform the total agro-forestry activities in the study area (Table 12). The random sampling procedure to know the growing stock of the forests reveals that there are on average 1261 stems per hectare in the forest. The forest stockings (stems/ha) is not too good for both the plantation and natural forests. Among different tree species found in the forests **Akashmoni** (67%) was found dominating followed by **Eucalyptus** (56%), **Gamar** (28%), **Mangium** (28%) and **Khantal** (28%) (Table 13). Species density was found higher for **Akashmoni** (44) followed by **Eucalyptus** (33), **Mangium** (21) and **Khantal** (20). Relative density was also found higher for **Akashmoni** (21) followed by **Eucalyptus** (16), **Mangium** (10) and **Khantal** (10) (Table 13). Most of the trees found in the forests are planted by the Forest Department. Only some scattered naturally grown plant species were found in the forests. The regeneration status of the forests was also found very poor having only 854 seedlings per

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