

Baseline Survey Report

Name of the project

Access to Food security and Accelerated Livelihood (AFAL)
towards Bio-diversity

Implementing entity

Sabalamby Unnayan Samity (SUS)
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Introduction

Bangladesh is very rich in biodiversity at ecosystems and species. It is a transitional zone of flora and fauna, because of its geographical settings and climatic characteristics. It is estimated that about 50 per cent or more of the land surface of Bangladesh is wetland, consisting of about 700 rivers, creeks, streams, and other water bodies known locally as Haor, Beel and Khal. The northeast region of the country, comprising the floodplains of the Meghna tributaries, has a distinct type of wetland that is known as the Haor Basin. In the past the Haor basin biodiversity was very rich but recently it is diminishing since the environment has degraded so much. Swamp forest is adapted to monsoon flooding for three to four months, to depths of 0.5 to 2.5 m; thus, much of the area now under monsoon rice would once have been occupied by swamp forest. Remnant forest patches are now restricted to areas sloping away from village highland down towards the Haor, helping to shelter homesteads from wave erosion; to elevated ridges between Beels; and to stream levees. These patches currently vary from a few plants to several hectares of more than a thousand trees.

This report describes the baseline survey result designed to establish the initial conditions of the project *“Access to Food Security and Accelerated Livelihood towards Biodiversity”* implemented by Sabalamby Unnayan Samity (SUS), partner NGO of Arannyk Foundation. The survey was designed to observe the current status of the trees in homesteads and around the village of the project participants. The project initially assumed that tree plantation and conservation improves the socio-economic condition of the household by increasing profitability, sustainability and food security by protecting homestead from the devastating wave. A part of the required of forestation may be fulfilled by raising suitable water tolerant perennial species in the khas land and surrounding homestead. Bio-diversity is a part of our daily life and livelihood; and constitutes the resources upon which families, communities, nations and future generations depend (Dowdeswell, 1995). The present survey tries to relate the selected characteristics of the households with their number trees and find out the risks faced by the community of the Haor area.

Objectives of the baseline survey:

- To assess the number of trees in the homestead at Haor area.
- To identify the species richness in study area.
- To know the socio-economic condition of household.
- To explore the relationship between the selected characteristics of household and number of trees in homestead at Haor area.
- To find out the risks faced by the households in their livelihood.

Methodology of the Baseline Survey

The baseline survey was conducted in two parts. First part (A) includes homestead survey with a pre-structured questionnaire format to assess the households' socio-economic status, number of trees and species richness in homestead area and explore relationship between the selected characteristics and number of trees in homestead area and the second part (B) includes assessment of the risks faced by the households in their livelihood through Community Risk Analysis (CRA)

Part A: Homestead survey

Homestead survey was conducted with a pre-structured questionnaire in the study area. The total households from the selected 4 villages, such as Kristapur, Laxmipur, Rasulpur and Ichapur were surveyed. The head of the each 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.

Part B: Risk assessment

For the assessment of the risks, Community Risk Analysis (CRA) was conducted with 10 households selected randomly from each village. In this study, the participants for CRA were selected from the community. Here, the participants from similar backgrounds or experiences were brought together to discuss the risks faced by them. The main purpose of conducting CRA was to identify the risks faced by the community, the affected sectors by the risk and ways of risk mitigation. For obtaining the description of the village, the facilitators walked through the village. Four CRAs were conducted in four villages namely Kristapur, Laxmipur, Rasulpur and Ichapur, each group consisting of ten participants. Purpose of discussion was explained and the specific risks faced by the community were asked to the participants in the group. Then the responses of the participants were listed down. The outcomes of four groups were merged together to get a comprehensive list of risks, affected sectors, mitigation ways by the participants. The additional information gathered during the CRAs was used for interpreting the results as well.

Results

Part A: Homestead survey

Location of the study

The study area is situated at Haor basin in Khaliajuri Upazila of Netrakona district. By considering the vulnerability and the consultant with local government, the selected villages are Laxmipur and Kristapur in Khaliajuri union and Rasulpur and Ichapur in Mendipur union. The beneficiary was selected based on their land size. The total beneficiary of the project is 518 nos. out of 558 in 4 villages of the project. They all are landless, marginal and small farmers. Based on Department of Agricultural Extension the

landless has up to 0.20 hectare (ha) land, the marginal has 0.21-0.50 hectare land and the small has 0.51-1.00 hectare land.

Condition of the forest and bio-diversity

The number of trees ranged from 0 to 160, while the average number of tree was 11.55 and standard deviation was 19.10. It is seen that the Haor people had very few number of trees. Analysis of the number of trees, 79 percent of the households were low number (up to 15 nos. of trees) of trees, while only 9.7 percent of the households were high (above 30 nos. of trees). It was seemed that the appropriate varieties of sapling in Haor area are not available.

Table 1: Distribution of households according to number of trees

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
-	0-160	Low (up to 15)	531	79	11.55	19.10
		Medium (16-30)	73	11.3		
		High (above 30)	54	9.7		
		Total	558	100		

Tree species richness

There are 25 species identified in the project area. Among those, 44 percent were fruit, 20 percent were timber, 28 percent were medicinal and 8 percent were swamp plant. It was found 11 fruit species, 5 timber species, 7 medicinal species and 2 swamp species in the project area. It was also indicated from the Table 3 that 44 percent were fruit, 20 percent were timber, 28 percent were medicinal and only 8 percent were swamp plant species (Hijal, Korocho etc.). But once upon a time there were more number of swamp plant species.

Table 2: Tree species richness of different plant groups at 4 selected villages

Village	Fruit	Timber	Medicinal	Swamp plant	Total
Kristapur	9	4	5	2	20
Laxmipur	8	3	3	1	15
Rasulpur	8	3	2	2	15
Ichapur	8	4	4	1	17
Average	8.25	3.5	3.5	1.2	16.75
All	11	5	7	2	25
(%)	(44%)	(20%)	(28%)	(8%)	

Age and occupation

The respondent household's age varied from 20 to 80 years with a mean 42.34 years and standard deviation 11.97. According to Department of Youth, Bangladesh, the

young is considered as 15-29 years. On the basis of age the households were classified into young (up to 29 years) and middle aged (30 to 50 years) and old (above 50 years) as shown in Table 3. The survey shows that the highest proportion (70.1 percent) of the households was middle-aged and the remaining 10 percent were young and 19.9 percent were old.

Table 3: Distribution of households according to their age

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
-	20-80	Young (upto 29)	56	10	42.34	11.97
		Middle (30-50)	391	70.1		
		Old (above 50)	111	19.9		
		Total	558	100		

According to the baseline survey, the occupation of the households were agriculture, fishing, agriculture labor and others, small business, carpenter, beggar, boatman, village police, housewife and barber. Among the respondents, most (58.35 percent) of the households' occupation were labor selling for agriculture or other purpose, while 24.6 percent were fishing, 12 percent were agriculture and rest of the households were engaged in others.

Education

The level of education of household respondents ranged from 0 to 12 having a mean 0.77 and standard deviation 2.24. Based on educational scores, the respondents were classified into four categories, such as no schooling (0), primary education (1 to 5), secondary education (6 to 10) and higher secondary (11 to 12) as shown in Table 4. Data furnished in Table 4 revealed that the highest proportion (87.3 percent) of the households did not go to school, but 61.29% percent of them could sign their name. All of them informed that they learnt how to sign from SUS. The lowest proportion (0.4 percent) had education at higher secondary level, 6.2 percent had education at secondary level and 6.1 percent of households had education at primary level. It was concluded from the survey that the education level of Haor area was not satisfactory.

Table 4: Distribution of households according to their education

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
-	0-12	No schooling	487	87.3	0.77	2.24
		Primary (1-5)	34	6.1		
		Secondary (6-10)	35	6.2		
		HSC (10-12)	2	0.4		
		Total	558	100		

Family size

The number of family members of the respondents ranged from 1 to 17 with an average 5.12 and standard deviation 2.03. The average family size of the selected women was similar to the national average family size of 5.2 (BBS, 2002). On the basis of family size score, the respondents were divided into three groups such as small (up to 4), medium (5 to 6) and large (above 6) as shown in Table 5. Computed data indicate that 41.9 percent of households had small family size, 37.3 percent had medium family size and the rest 20.8 percent had large family size.

Table 5: Distribution of households according to their family size

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
-	1-17	Small (upto 4)	234	41.9	5.12	2.03
		Medium (5-6)	208	37.3		
		Large (above 6)	116	20.8		
		Total	558	100		

From the Table 6, it was revealed that up to 2 years child had in 36.02 percent family, 2 to 5 years child had in 40.68 percent family, 6 to 10 years child whose does not go to school had in 31.89 percent family of the total household in Table 6. It was also found that disabled were present in 5.37 percent family, widow were in 19.71, lactating mother were in 34.76 family and pregnant mother were present in 8.06 percent of the total household.

Table 6: Distribution of households according to the criteria of the family member

Item	Name of village				Total	%
	Kristapur	Laxmipur	Rasulpur	Ichapur		
Child (upto 2 years)	35	18	74	74	201	36.02
Child (2 -5 years)	45	37	104	41	227	40.68
Child does not go to school (6-10 years)	31	21	99	27	178	31.89
Disabled	12	2	11	5	30	5.37
Widow	30	10	26	44	110	19.71
Lactating mother	42	21	59	72	194	34.76
Pregnant mother	9	5	21	10	45	8.06

Land holdings

Analysis of the total land holdings suggests that most of the households were landless. It was showed in Table 7 that the landless of the households were 68.64 percent in Kristapur, 98.25 percent in Laxmipur, 88.44 percent in Rasulpur and 84.12 percent in Ichapur village. It was concluded that most of the Haor people are landless and the homestead are very less.

Table 7: Distribution of households according to their land holdings (%)

Category	Name of village				Total
	Kristapur	Laxmipur	Rasulpur	Ichapur	
Landless (upto 0.20 ha)	68.64	98.25	88.44	84.12	83.59
Marginal (0.21-0.50 ha.)	22.04	1.75	7.51	7.06	10.04
Small (0.51-1.00 ha)	9.32	0	4.05	8.82	6.37
Total	100	100	100	100	100

Annual income and food intake status

The annual income of the households ranged from 10 to 520 thousand Taka with an average of 45.74 thousand Taka and standard deviation of 38.60. It was found that 73.3 percent of the households had low annual income, while only 3.8 percent had high income. Most of the households were landless, so their annual income was low.

Table 8: Distribution of households according to their annual income

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
-	10-520 (‘000’ tk)	Low (upto 50)	409	73.3	45.74	38.60
		Medium (51-100)	128	22.9		
		High (above 100)	21	3.8		
		Total	558	100		

Analysis of food intake status from their own house, it was revealed in Table 9 that the most (68.64 percent) households take food only 0-3 months from their own house, 20.25 percent households take food 4-6 months from their own house, 3.94 percent households take food 7-9 months from their own house and 7.17 percent households take food 10-12 months from their own house.

Table 9: Food intake status from their own house of the households

Item	Name of village				Total	%
	Kristapur	Laxmipur	Rasulpur	Ichapur		
0-3 months food intake from own house	65	56	111	151	383	68.64
4-6 months food intake from own house	41	1	56	15	113	20.25
7-9 months food intake from own house	12	0	5	5	22	3.94
10-12 months food intake from own house	2	0	20	18	40	7.17
Total	120	57	192	189	558	100

Organizational participation

The organizational participation scores of the households could range from 0 to 8, while the observed scores ranged from 0 to 5. The average score was 0.92 and standard deviation 0.61. According to organizational participation scores, the households were classified into four categories, such as no participation (0), less participation (1 to 2), medium participation (3 to 4) and high participation (above 4) as shown in Table 10. Table shows that the highest proportion (78.5 percent) of the households was less participation, while 19 percent were no participation.

Table10: Distribution of households according to their organizational participation

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
0-8	0-5	No (0)	106	19	0.92	0.61
		Less (1-2)	438	78.5		
		Medium (3-4)	13	2.3		
		High (above 4)	1	0.2		
		Total	558	100		

Communication exposure

The communication exposure scores of the household respondents ranged from 3 to 30 against the possible range 0 to 30 with the average being 8.37 and standard deviation 3.33. According to rated score (0-30), the respondents were classified into three

categories as low (0 to 10), medium (11-20) and high (21 to 30). It was found from the survey that the highest proportion (87.8 percent) of the respondents had low communication exposure, while 10.4 percent had medium and 1.8 percent had high communication exposure.

Table 11: Distribution of households according to their communication exposure

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
0-30	3-30	Low (0-10)	490	87.8	8.37	3.33
		Medium (11-20)	58	10.4		
		High (21-30)	10	1.8		
		Total	558	100		

Knowledge on tree species

Analysis of knowledge on tree species by the households’ showed that average knowledge level was 20.36 and standard deviation 5.79. The scores knowledge on tree species of the household respondents ranged from 8 to 26 against the possible range 0 to 26. Table showed that the highest proportion (54.3 percent) of the respondents had high knowledge level on tree species, while 1.3 percent had less and 44.4 percent had medium knowledge level on tree species.

Table 12: Distribution of households according to their knowledge on tree species

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
0-26	8-26	Less (0-9)	7	1.3	20.36	5.79
		Medium (10-18)	248	44.4		
		High (19-26)	303	54.3		
		Total	558	100		

Knowledge on forestation

The Knowledge on forestation scores of the households could range from 0 to 24, while the observed scores ranged from 12 to 24. The average score was 21.77 and standard deviation 3.42. According to Knowledge on forestation scores, the households were classified into three categories, such as less (0 to 8), medium (9 to 16) and high (17 to 24) as shown in Table13. Table shows that the highest proportion (86 percent) of the households was high knowledge level on forestation, while 14 percent were medium knowledge level on forestation

Table 13: Distribution of households according to their knowledge on forestation

Range		Category	Households		Mean	Standard deviation
Possible	Observed		Number	Percent		
0-24	12-24	Less (0-8)	0	0	21.77	3.42
		Medium (9-16)	78	14.0		
		High (17-24)	480	86.0		
		Total	558	100		

Relationship between the selected characteristics and number of trees

The selected eight characteristics constituted the independent variables, while number of trees of the household was the dependent variable. To explore the relationship between the dependent and independent variables, Pearson's Product Moment Correlation Co-efficient (r) has been computed. At least five percent (0.05) level of probability has been used as the basis for rejection of the null hypothesis "There is no relationship between the selected characteristics of the household and their number of trees". The relationship between the dependent and independent variables has been presented in Table 14.

Table 14: Relationship between the selected characteristics and number of trees

Selected characteristics	'r' value with number of trees
Age	0.112**
Education	0.007
Family size	0.176**
Annual income	0.119**
Organizational participation	0.108*
Communication exposure	0.103*
Knowledge on tree species	0.366**
Knowledge on forestation	0.184**

** Significant at 1% level of probability

* Significant at 5% level of probability

Analyzing relationship between the selected characteristics and number of trees in Table 13 showed that based on the computed ' r ' value the relationship between education of the household and their number of trees was non-significant. But other selected characteristics of the households were positively significant with number of

trees. It was concluded that number of trees depend on age, family size, annual income, organizational participation, communication exposure, knowledge on tree species and knowledge on forestation. But education could not play any role on number of trees of the households.

Part B: Risk assessment

Identified Risks

The risks faced by the community were identified in participatory approach. The Haor area is remarkable disadvantaged area of our country. They are facing different risks in regularly. The identified risks faced by the Haor people are devastating wave which is locally called *afal*, flood, early flood, drought, Cyclone etc. showed in Table 15.

Table 15: Identified risks faced by the community

SL. No.	Name of Risks
1	Devastating Wave (locally known as 'afal')
2	Flood
6	Early Flood
4	Drought
5	Cyclone
6	Scarcity of food
7	Communication
8	Arsenic
9	Insects
10	Hailstorm

Traditionally, forests were managed communally to provide protection of village highland from wave erosion; coppices were harvested in three years' rotation for fuel wood, housing posts, and fish entrenchment (*katha*). One or two branches per year can be taken on a sustainable basis. In recent years, however, outsiders (typically a *jalmohal* lessee) have taken control, increasing the frequency of the coppicing and the number of branches. The swamp plants (Koroch: *Pongamia pinnata*, Hijal: *Barringtonia acutangula*) were diminished in Haor area. As a result, the levels of risk are increasing day by day.

Transact Report

Land use	High Land	Low land	Irrigation canal	Pond side	Pond	Front and back side of house	Homestead	Road
Soil	Clay loam	Clay loam		Clay loam	Clay loam	Clay loam	Clay loam	Clay loam
Tree				Dol kolmi	Hijol ,koroch	Hijol ,koroch	Raintree,koroi, mango, mehogoni	Rain tree
Crop	BRRI, boro, potato, chilli, brinjal, vegetable	Irri, borro	-	-	-	Kul, guava, mango	Jackfruit, mango, papaya, pomegranate	
Fish	-	Traditional fish (Shing, magur,tengra, Boal etc.)	Traditional fish (Shing, magur, taki tengra, Boal etc.)	-	Carp like fish	-	-	-
Problem	Irrigation problem due to the canal, water bodies filled with soil	Often rice cultivation became hamper due to much water	Less depth-ness of the canal	Over flooded	Fishes come out from the pond	Fallow land	High population density, unavailability of drinking water, Less opportunity of plantation	Submerged under water in rainy season and boat is only the transportation system
Solution	Use surface water (low land) trough canal system, deep tube-well by the initiative of government		Digging for increasing the depth of canal by community and government initiatives	Earth work for increasing the height of pond side		Vegetable, potato, mustard cultivation,	Sinking tube-well, use of family planning method	Submerged road by GO initiatives.

Risk-affected Sectors

Sectors Name	Risks									
	Devastating Wave	Flood	Early flood	Drought	Cyclone	Scarcity of food	Communication	Arsenic	Insects	Hailstorm
Homestead	√	√			√					
Agriculture		√	√	√					√	√
Health		√				√	√	√		
Trees	√	√		√	√					
Livestock	√	√								
Education	√	√				√	√			

Description of Risks

Risk	Sectors	Description
Devastating Wave	Housing	80% homestead as well as a village became destroyed
	Tree	50% trees destroyed due to devastating wave
	Education	During the devastating wave students can not go school
		Education system became hamper due to loses of education materials
Scarcity of Food	Health	Diseases come out
		Less oppportunity of treatment facilities due to shortage of money
	Education	The students loses their curiosity go to school due to scarcity of food
	Livelihood	Food crisis for 80% people in Feb.-March

Ranking of Risks

Risk	Description	Rank
Devastating Wave	80% homestead as well as a village became destroyed	1
	50% trees destroyed due to devastating wave	2
	During the devastating wave students cannot go school	7
	Education system became hamper due to loses of education materials	8
Scarcity of Food	Diseases come out	4
	Less oppportunity of treatment facilities due to shortage of money	5
	The students loses their curiosity go to school due to scarcity of food	6
	Food crisis for 80% people in Feb.-March	3

Risk Analysis

Description of risk	Tentative Result	Effect Level	Tentative Period	Status of risk	Acceptability of Risk
80% homestead as well as a village became destroyed	Economical	High	Each Year	Extreme	Non-manageable
50% trees destroyed due to devastating wave	Economical and environmental	High	Each Year	Extreme	Non-manageable
During the devastating wave students can not go school	Unconsciousness increase	Medium	Each Year	Low	Manageable
Education system became hamper due to loses of education materials	Economical, illiteracy	Medium	Each Year	Medium	Manageable
Diseases come out	Economical	Medium	Each Year	Medium	Manageable
Less opportunity of treatment facilities due to shortage of money	Physical, Debtor	Medium	Each Year	Medium	Manageable
The students loses their curiosity go to school due to scarcity of food	literacy rate decrease	Medium	Each Year	Medium	Non-manageable
Food crisis for 80% people in Feb.- March	Social and economical	High	Each Year	Extreme	Non-manageable

Risk Mitigation

Description of risks	Mitigation	Traditional activity	Limitations
80% homestead as well as a village became destroyed	- Plantation by water tolerant plants around the village - Protection wall by bricks	- Use of bamboo and Challia grass -	- Unavailability of water tolerant sapling, bamboo and Challia grass
50% trees destroyed due to devastating wave	- More plantation by appropriate Haor-friendly (Hijal, Koroch etc.) plants - Caretaking regularly	- Plantation in homestead	- Unavailability of Haor-friendly sapling
Food crisis for 80% people in Feb.-March	- Employment generation by IGAs, such as poultry rearing, beef fattening, vegetable cultivation, cottage industry, small enterprise etc.	- Early labor selling	- Lack of capital and skill

Impact Analysis of Risks

Mitigation Way	Objective	Alternative	Social/political	Technical/economical	Environmental	Sustainability
Plantation and conservation of Haor-friendly (Hijal, Koroch etc.) plants	Environmental balance and protecting village from devastating wave	-	Linkage with local government	- Planted in November-December - Donor and NGO Cooperation - Village committee	- Ensuring environmental balance	- Regular supervision and caretaking
Running appropriate IGAs	- Employment generation	Agricultural activity	Social status and dignity increased	- Village committee formation - GO-NGO cooperation	- Helpful for environmental balance	- Handling with need-based by village committee

Tentative Work Plan

Mitigation Way	Who responsible	When implemented	How to implement	Where implemented	Considered issues
Plantation and conservation of Haor-friendly (Hijal, Koroch etc.) plants	GO-NGO	November-December	By village committee with the help of local government	Around the village specially wave affected side	<ul style="list-style-type: none"> - Height of sapling (above 3 feet) - Planting properly with bamboo stick - Caretaker for the primary stage
Running appropriate IGAs	GO-NGO	All around the year	By village committee with the help of local government	Selected villages	<ul style="list-style-type: none"> - Beneficiary selection by village committee - Capacity building for IGAs running

Conclusion

The Haor area is remarkable disadvantaged region of Bangladesh. Once swamp plants (Koroch, Hijal etc.) protected the village highland from the devastating wave erosion. But now a day the numbers of trees in Haor is very poor. Most of the households had very few numbers of trees. It was seemed that the appropriate varieties of sapling in Haor area are not available. There were 25 plant species including fruit, timber, medicinal and swamp plant identified in the project area. More than half of the households are selling labor agricultural and other purposes. The education level was not satisfactory. The average family size of the households was similar to the national average family size. Finally, it can be said that the people of the Haor area are facing different risks in their livelihood. For mitigation the devastating wave erosion that is prior risk in their life, plantation and conservation of swamp forest is very needed and environmental. The households had no income generating activities and they are often dependent on plants. For conservation of the forest, it has been created employment generation.

It is also observed that people who are engaged with IGAs are not destroying the plants rather people who have no source of income are dependent on plants. So, the NGOs activities should be increased in Haor area of Bangladesh creating awareness about plantation and conservation, the need for biodiversity conservation and their environmental, social and economic benefits for the people and also employment generation.