Result and Impact Management System (RIMS) and Baseline Survey (RBLS), 2013

Final Report for Baseline Part

Conducted for

Hoar Infrastructure and Livelihood Improvement Project (HILIP)
Local Government Engineering Department (LGED)
Ministry of LGRD&C, Bangladesh

By

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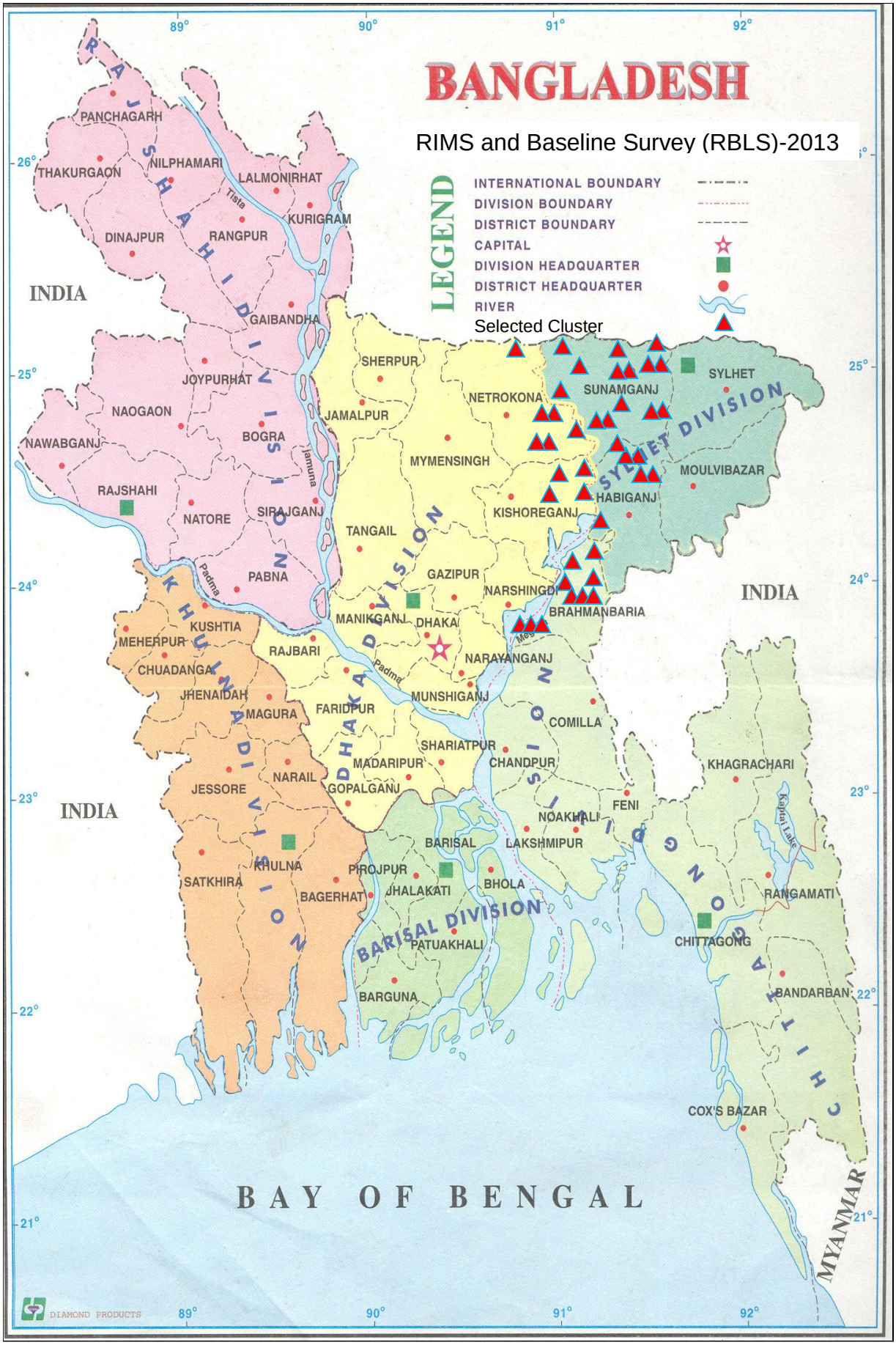
Content

Climate and Livelihood Protection (CALIP)

Traffic Volume Counting Survey


BANGLADESH
RIMS and Baseline Survey (RBLS)-2013
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DIVISION BOUNDARY
DISTRICT BOUNDARY
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Selected Cluster
RAJSHAHI DIVISION
KHULNA DIVISION
DHAKA DIVISION
SYLHET DIVISION
BARISAL DIVISION
CHITTAGONG DIVISION
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NAWABGANJ
BOGRA
RAJSHAHI
NATORE
SIRAJGANJ
PABNA
KUSHTIA
MEHERPUR
CHUADANGA
JHENAIDAH
MAGURA
JESSORE
NARAIL
KHULNA
SATKHIRA
BAGERHAT
SHERPUR
JAMALPUR
MYMENSINGH
NETROKONA
SUNAMGANJ
SYLHET
MOULVIBAZAR
HABIGANJ
KISHOREGANJ
TANGAIL
GAZIPUR
NARSHINGDI
BRAHMANBARIA
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DHAKA
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NARAYANGANJ
MUNSHIGANJ
FARIDPUR
MADARIPUR
GOPALGANJ
SHARIATPUR
COMILLA
CHANDPUR
NOAKHALI
FENI
LAKSHMIPUR
KHAGRACHARI
RANGAMATI
CHITTAGONG
BANDARBAN
COX'S BAZAR
BARISAL
PIROJPUR
JHALAKATI
BHOLA
PATUAKHALI
BARGUNA
INDIA
INDIA
MYANMAR
BAY OF BENGAL
Tista
Jamuna
Padma
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1. Introduction

The first Result and Impact Management System (RIMS) and Baseline Survey (RBLS) of the Haor Infrastructure and Livelihood Improvement Project (HILIP), briefly known as RBLS, was conducted at the baseline stage of the project. The Survey was implemented in two parts: (i) an IFAD RIMS part and (ii) a baseline part. This report, as it name suggests, presents the survey findings from the baseline part. The findings from the RIMS part are provided in a separate report labeled as 'Result and Impact Management System (RIMS) Report'.

The purpose of the baseline part was to obtain the information to be used as references by the project stakeholders to assess the outcomes of project interventions through the second and the third baseline part to be conducted subsequently in the project area. The baseline part was implemented by using the same sample used for the RIMS part, but by using a separate questionnaire.

2. Brief Description of HILIP

The Haor Infrastructure and Livelihood Improvement Project (HILIP) is undertaken by the Government of Bangladesh with financial supports from the International Fund for Agricultural Development (IFAD) and the Spanish Food Security Co-financing Facility Trust Fund. The project will be implemented in 28 Haor Upazilas of the following five districts in north-eastern Bangladesh: Kishoreganj, Netrakona, Sunamganj, Habiganj and Brahmanbaria, and would target about 688,000 households living in the Haor Basin, mainly (i) smallholder farming households with less than 2.5 acres of land; (ii) small fishing households deriving a major share of their income from fishing; (iii) women from poor households; and (iv) small traders and market intermediaries in local markets.

The Haor Basin in north-eastern Bangladesh is subject to very peculiar conditions and suffers from extensive annual flooding. This makes livelihoods extremely vulnerable and limits the potential for agriculture production and rural economic growth. For 6 to 7 months of a year, the cropped land is completely inundated. Rural poor households have to depend upon fisheries and off-farm labor. The communication infrastructure is poorly developed with submersible rural roads providing some connectivity during the dry season and boats being the main source of communication during the flood season. The poor communication network limits the incentives for increasing production, discourages rural growth, limits access to markets and off-farm employment opportunities and further limits access to existing social services particularly health and education. Strong wave action adds to the vulnerability as it can potentially wash away the land and poses a major threat to many villages in the Haor. Protection of villages against flood action, proper management of the fishery resources and securing existing livelihoods such as crop and animal production are critical needs for the poor rural households living in the Haor region. HILIP has been designed to address those constraints in the project area.

The **goal** of the project is to contribute to the reduction of poverty in the Haor Basin. The **development objective** of the project is to improve living standards and reduce vulnerability of the poor. The **main outcomes** expected from the project include (i) enhanced access to markets, livelihood opportunities and social services; (ii) enhanced village mobility, reduction in production losses and protection against extreme weather events; (iii) enhanced access to fishery resources and conservation of biodiversity as a follow up of SCBRMP; (iv) enhanced production, diversification and marketing of crop and livestock produce; and (v) efficient, cost effective and equitable use of project resources. The project includes five components: (i) Communications infrastructure; (ii) Community infrastructure; (iii) Community resource management; (iv) Livelihood Protection; and (v) Project Management.

3. Baseline Indicators

Indicators that were assessed in the baseline part are listed by specific subjects of measurement, in Table 3.1.

Table 3.1: Baseline part indicators by subject of measurement

Subjects of measurement	Indicators
Status of crop production	a) Rice yield per acre b) Input costs of growing rice per acre c) Number of rice crops grown d) Variety of rice grown e) Loss of rice crop due to flooding
Storing of rice	a) How is rice stored b) If rice stored is damaged c) Reasons that rice is damaged
Rice cropping practices	a) Use of high quality seeds b) Maintaining proper spaces a) Use of recommended seed storage methods b) Controlling of pest c) Proper use of fertilizer
Homestead gardening	a) Types of vegetables grown
Access to markets	a) Distance of the nearest market b) Usual mode and cost of transportation to the market c) Location where vegetables grown in the village are sold d) If not the nearest market, reasons for not selling in the nearest market
Membership with Micro Credit Group (MCG)	a) Whether a member of a MCG b) Whether received any loan c) Purposes of receiving the loan d) If not a member, whether there is other opportunities to get a loan
Membership with BUG	a) Whether any member of your household raise/ catch fish b) Where is fish raised (in own ponds/in ponds taken on lease) c) Types of fish grown d) Where is fish caught (canals/rivers/beels) e) Types of fish caught f) Whether having an authorization to catch fish from these water bodies g) Whether any one from you're your household has membership with BUG h) Advantages of having membership with BUG
Education of farmers	a) Highest class passed
Employment status of women	a) whether engaged in any income earning activity
Access to information and technology	a) Awareness of sources of information and support for agriculture, livestock

	rearing, gardening, or pond/fish management b) Whether received any information or support from any of the sources c) If received, what information/support was received
Types of assistance needed for farming	Indicators to be determined in consultation with PMU
Role of women in decision making	a) Making purchases of daily household needs b) Making purchase/sales of major household assets (such as land) c) Spending money that women earn d) Arranging marriage of children e) Obtaining health care for women and children
Livestock mortality and vaccination	a) Number of animals which died b) Number of animals sold c) Number of animals vaccinated d) Frequency of vaccinating animals
Capacity building	Indicators to be determined in consultation with PMU

4. Methodology

4.1 Sample Design

As stated earlier, the baseline part was carried out by collecting data from the same sample used for the RIMS part. The sample consisted of 1,200 households drawn in 40 clusters from the five project districts: Kishoreganj, Netrakona, Sunamganj, Habiganj and Brahmanbaria. A cluster consisted of 250-350 households, formed with one or more villages or part of a village. The sample was drawn in three stages. At the first age, 40 unions were selected with PPES method from the list of unions arranged by districts. Villages (clusters) were selected at the second stage, randomly picking one village from each of the selected unions. Thus the sample was made up of randomly chosen 40 clusters.

Households were selected at the third stage, including 30 households from a selected village to yield the sample of 1,200 households. The way the households from a village were selected is described below.

- Reaching the village, first the interviewer team located a central point in the middle of the village.
- At the central point, the team supervisor or an interviewer spun a pen and noticed the direction indicated by the pen after it had stopped spinning.
- Moving in the indicated direction, the team conducted interviews with consecutive households, one after another, until having 30 households interviewed for the village.
- When the team could not have completed interviews with 30 households even after reaching the end of a line, the team took a right turn to move to the next line to continue interviewing for the remaining households.
- When it was not possible to interview a ‘to be interviewed‘ household, the household was marked as ‘non-responsive’, noting the reason it could not be interviewed for.

4.2 The Questionnaires

The questionnaire of the baseline part (known as the baseline questionnaire) was developed by Mitra and Associates. Along with the baseline questionnaire, data were also collected for CALIP, using a third questionnaire supplied by the Project Management Unit (MPU). In addition, a fourth questionnaire was used to gather information on volume of traffic over a representative sample of upazila and union roads.

4.3 Data collection

Data for both the RIMS part and the baseline part were collected simultaneously, over a period of one month from 26 May to 22 June 2013. Five Interviewing teams were deployed for the data collection. An interviewing team consisted of three male, two female interviewers and one logistical assistant led by a male supervisor and a female editor. Each of the interviewers and supervisors/editors had previous experience in carrying out household surveys and collecting anthropometric data. One Research Officer and four Quality Control Officers visited the interviewers in the field and re-interviewed about 10% of households on random basis to ensure the quality of the data.

An interviewing team spent two days for collection of data from a cluster. In a sample household, demographic and socio-economic data were collected by interviewing the female household head/wife of the male household head.

4.4 Training of Interviewers and Supervisors/Editors

The interviewing team members including both interviewers and supervisors/editors were given a ten days training to prepare them for the data collection work. The training consisted of nine days of class room training and one day of field training. During the field training the trainees conducted practice interviews in a village near Dhaka city. The class room training was provided in the training hall of Mitra and Associates. The training was imparted by the professional staff members of Mitra and Associates. Two representatives of LGED participated in the class room training for a day as resource persons to oversee the training and assess its quality

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4.5 Data Entry and Analysis

Data were entered using CSPro Programme used for the Bangladesh Demographic and Health Survey (BDHS). In order to keep the data entry errors at a minimum level, data were entered in two different computers. The data base files from both the computers were then compared to identify the entry errors by running a matching programme developed by Mitra and Associates. The observations that did not match were identified and manually corrected in both the data files. This is proven to be a useful and efficient method of data cleaning.

4.6 Findings

This report contains the findings related to the followings:

- Crop production, cropping intensity, types of crops grown and modern rice cropping practices
- Yield of rice
- Costs of production, returns and benefit-cost ratios
- Effects of floods
- Storing of rice
- Homestead gardening
- Access to market
- Household loans: receipts and repayments of loan, and, sources and uses of loan
- Membership with micro credit group (MCG)
- Fishing and fish cultivation
- Access to information and assistance
- Employment status of women, women's empowerment and their autonomy
- Domestic animals' vaccination rates and death rates
- Decisions about financial matters, wife's personal matters and matters concerning children
- Capacity building
- Education of farmers
- Awareness of and access to health service centers
- Sources for seeking health and family planning services

5. Agricultural productivity

A wide range of data was collected in the survey, pertaining to agricultural production, by asking a respondent a battery of questions to answer what types of crop her household grew in the year before the survey, how much land was used to grow a type, how much yield was received and what was the price of the yield per kilogram (Kg). The way the questions were asked and their answers recorded can be seen from the survey questionnaire attached as appendix. Using these data then, the following estimates were calculated for a type of crop for the entire sample: total area in hectares of land used to grow it, its total yield received in tones, its average yield in tones per hectare, total costs incurred in growing it, and the total gross and net returns received from growing it.

5.1 Cropping intensity and types of crops grown

Table 5.1 gives the area of land in the sample used to grow a specific type of crop by variety in the year before the survey. As shown in the table, in the year before the survey, the total area of net land cultivated (or net cultivated land) in the sample measured 505.93 hectares, while the area of land used to grow crops (crop land) measured 574.27 hectares. The cropping intensity of land was thus found to be (total crop land=574.27/total net cultivated land=505.93/)*100 or 113.6% for the project districts.

Rice is mainly grown in the project districts, and *Boro*, a type of rice, is their major crop being grown in the largest area of the crop land. In the year before the survey, *Boro* rice was grown in 458 hectares of land in the sample. The other two types of rice, *Aman* and *Aus*, were grown in much smaller areas: *Aman* in 87 hectares and *Aus* in only few of 8 hectares.

Vegetables were grown in small areas, indicating that most land in the project districts was not suitable for growing them. In the year before the survey, vegetables were grown in only 21.5 hectares accounting for 3.7% of the crop land. The vegetables that were grown were listed into three groups: Only Robi, only *Kahrif* and *Both Kharif and Robi*. Only *Robi* group included the vegetables grown during only the Robi season, only *Kharif* group the vegetables grown during only the Kahrif season, and the *Both Kharif and Robi* group included the vegetables grown during the both seasons. Only *Robi* group was the mostly grown vegetables in the sample in the year before the survey, grown in 14 hectares. In contrast, only *Kharif* group was grown in only 5 hectares and the *both Kharif and Robi* group in 3 hectares.

On the over all, crops in HYVs (High Yielding Varieties) were grown in 85% of the total crop area of 574 hectares, amounting to 489 hectares compared to only 85 hectares for the local varieties. The overall variation was largely due to *Boro* rice. *Boro* rice was grown in HYVs in 94% of the total area (458 hectares) used for growing that crop, amounting to 433 hectares against 26 hectares for the local varieties. Vegetables were also grown in HYVs in more area than with local varieties. But a reversal of the trend was seen in the cases of *Aman* rice and *Aus* rice, being grown in local varieties in slightly more area.

Table 5.1: Area (in hectares) of land used to cultivate a specific type of crop in the year before the survey by variety

Type of crops			All
	HYV	Local	
Aus	2.03	5.56	7.60
Aman	41.66	45.07	86.73
Boro	432.88	25.57	458.45
Vegetables	2.87	1.73	4.59
Kharif	7.83	5.88	13.71
Robi	1.97	1.20	3.18
Both			
Total crop land	489.28	85.19	574.27
Total net cultivated land			505.93
Intensity {(Total crop land/Total net cultivated land)*100}			113.508

5.2 Yield of rice

Table 5.2 gives average yield in tones per hectare of rice grown in the year before the survey. Along with data used to calculate it. The average yield of *Boro* rice per hectare was calculated as (total yield in tones of *Boro* in the sample=1,902.44)/(total area in hectares used to grow *Boro* in the sample=458.45). Similarly, the averages for the other two types of rice (*Aman* and *Aus*) as well as for all the three types taken together were computed. The average yield of rice per hectare was found to be 3.89 tones, being 2.48 tones for *Aman* rice and higher 4.15 tones for *Boro* rice. *Aus* rice unexpectedly was registered with the highest average yield at 4.32 tones; this finding should be treated with caution, since it might have been a result of large sampling fluctuations based on only few hectares of land. As reported earlier, *Aus* rice was grown in only 8 hectares, while *Aman* rice was grown in 87 hectares and *Boro* rice *in* 458 hectares. Both for Boro and Aman, HYVs had higher yields than local varieties. While the average yield of *Boro* per hectare was 3.59 tons from local varieties, it was higher 4.18 tones for HYVs. Similarly, for Aman, the average yield per hectare appeared higher 2.58 tones for HYVs than 2.38 for local varieties. But a reversal of the trend was noticeable in case of Aus showing its higher yield per hectare for local varieties (4,35 tones) than for HYVs (4.25 tones).

Table 5.2: Yields (in tons) per hectare in the year before the survey by type of crop and variety

Type of crops	High yielding variety			Local variety			All		
	Total Land cropp-ed in the sample	Total yield in the sample	Yield per hectare	Total Land cropp-ed in the sample	Total yield in the sample	Yield per hectare	Total Land cropp-ed in the sample	Total yield in the sample	Yield per hectare
Aus	2.03	8.64	4.25	5.56	24.21	4.35	7.60	32.85	4.32
Aman	41.66	107.33	2.58	45.07	107.41	2.38	86.73	214.73	2.48
Boro	432.88	1810.61	4.18	25.57	91.83	3.59	458.45	1902.44	4.15
Total	476.57	1926.58	4.04	76.21	223.45	2.93	552.78	2150.03	3.89

5.3 Costs of production

Costs of production of crops were calculated by collecting information about both the input costs as well as the labour and processing costs that a household reported as incurred in growing a specific crop. Input costs included the expenses made for plough/power tiller, seeds/seedlings, chemical fertilizers, organic fertilizers (cow-dung/ashes), irrigation, pesticides and other inputs. The labour and processing costs included the value of own labour, the wages of hired labour, and the expenses for the processing and preservation. Calculated costs of production for a specific crop per hectare in the sample are provided in Table 5.3, in three parts as input costs, labour and processing costs, and the sum of the two as total costs.

Among the three types of rice, costs of production were highest for *Boro*, lowest for *Aman* and intermediate for *Aus*. While total costs of production per hectare were Taka 51,900, for *Boro*, they were lower Taka 41,487 for *Aus* and further lower Taka 31,878 for *Aman*. Similar patterns of variations remained evident among the three types, even when they were compared separately for the input costs and the labour and processing costs.

Production costs were generally much higher for vegetables than for any type of rice, except for *Robi* vegetables. Total costs of production per hectare were found to be Taka 74,092 for *Kharif* vegetables and Taka 172,269 for *both Kharif and Robi* vegetables, while they were highest at Taka 51, 900 for *Boro* among the three types of rice. Even for *Robi* vegetables, costs of production, noted at Taka 47,795, appeared higher than for *Aus* rice (Taka 41,487) and *Aman* rice (Taka 31,878).

Costs of production were generally higher for HYVs than for local varieties. While total costs of production per hectare for Boro were Taka 41,058 for local varieties, they were higher at 52, 540 for HYVs. Similar variations were emergent in the comparisons for the other crops except for *Aman* rice and *Robi* vegetables. There were virtually no variations in costs of production of *Aman* rice by varieties, being Taka 31094 for HYVs and only slightly different Taka 32602 for local varieties.

5.4 Returns and benefit-cost ratios

The cash value of the yield that a household received from growing a crop in the year before the survey was assessed by asking the household the yield's sale price per Kg (kilogram). The gross returns per hectare were then computed as the average cash value of the yield received from a hectare in the (total) sample. The net returns per hectare were computed by subtracting the total costs of production per hectare from the gross returns per hectare, while the benefit-cost ratio of production was computed as the ratio of the gross returns to the total costs. All the three estimates—gross returns, net returns and the benefit-cost ratios --- for specific crops are also provided in Table 5.3.

Gross returns per hectare from cultivation of rice crops were highest Taka 66,984 for the least widely grown *Aus,* intermediate at Taka 57,839 for the most widely grown *Boro* and lowest Taka 36,756 for the moderately grown *Aman*. Net returns per hectare were also notable in the same order, being Taka 25,496 for *Aus*, Taka 5,939 for *Boro* and 4,879 for *Aman*.

Growing of rice was found to be generally profitable. This became evident when the benefit-cost ratios of growing rice were compared by type. There were however variations in profits by type of rice. Profits were least for the most widely grown *Boro* and most for the least widely grown Aus. Benefit –cost ratios emerged to be 1.11 for *Boro*, while they were higher 1.15 for *Aman* and highest at 1.61 for *Aus* .

Compared to rice crops, both gross returns and net returns per hectare appeared much higher for growing of vegetables. Gross returns per hectare from growing vegetables were highest Taka 462,832 for *both Robi and Kharif* vegetables, intermediate at 128,393 for *only* Kharif vegetables and lowest Taka 83,979 for *only Rob*i vegetables, while the net returns per hectare were highest Taka 290,569 for *both Robi and Kharif* vegetables, intermediate at 54,301 for *only* Kharif vegetables and lowest Taka 36,183 for *only Rob*i vegetables. Thus, growing of vegetables appeared to be much more profitable than growing of rice. For the three types of vegetables, benefit-cost ratios were highest 2.69 for both *Robi and Kharif* vegetables followed almost equally by *only Rob*i and only Kharif vegetables with 1.76 and 1.73 respectively.

There were no marked variations in gross returns from growing of rice between HYVs and local varieties. Gross retrns per hectare for *Boro* were only slightly higher Taka 58,024 from HYVs, compared to Taka 54,708 for local varieties. The variations were even smaller for Aus and Aman. However, in contrast, net returns were found to be higher from local varieties than from HYVs, for both *Aus* and *Boro*. While net returns per hectare for *Aus* were Taka 21,654 from HYVs, they were higher Taka 26,899 for local varieties. For *Boro*, the variations were higher Taka 13,649 for local varieties, compared to Taka 5,484 for HYVs. But Net returns for *Aman* were higher for HYVs as were the gross returns. *Aman*'s net retruns per hectare were Taka 6,370, compared to only Taka 3,500 for local varieties. In terms of benefit-cost ratios, growing of both *Aus* and *Boro* was found to be more profitable if they were grown in local varieties than in HYVs, while the reverse was the case with *Aman*.

Among vegetables, gross returns for only *Kharif* vegetables were higher from HYVs (Taka 139,781) than from local varieties (Taka 109,476), while the reverse was true for the *only Robi* vegetables and *Both Kharif and Robi* vegetables, with *only Robi* having a gross return of Taka 113,973 from local varieties against Taka 61,460 from HYVs, and both Kahrif and Robi having a gross return of Taka 590,543 from local varieties against Taka 323,805 from HYVs. But all the three types of vegetables were found to have higher net returns from local varieties than from HYVs. In terms of benefit-cost ratios, *only Kharif* vegetables emerged to be more profitable if grown in HYVs than if grown in local varieties, while the reverse was true fro *only Robi* vegetables and *both Kharif and Robi* vegetables.

Table 5.3: Costs of crop production per hectare and the returns per hectare and the benefit-cost ratios in the year before the survey

	Costs in Taka		Returns			
Variety/ crop	**Input**	**Labour and process**	**Total**	**Gross**	**Net returns**	**Benefit-cost Ratios(1)**
High yielding variety (HYV)						
Aus	20438	25878	46316	67970	21654	1.47
Aman	13675	17419	31094	37464	6370	1.20
Boro	26856	25684	52540	58024	5484	1.10
Kharif	40519	51247	91766	139781	48015	1.52
Robi	18227	14100	32327	61460	29133	1.90
Both	100823	84359	185182	323805	138623	1.75
Total	**25947**	**25182**	**51130**	**57921**	**6791**	**1.13**
Local variety						
Aus	18241	21483	39725	66624	26899	1.68
Aman	13231	19371	32602	36103	3501	1.11
Boro	17688	23370	41058	54708	13649	1.33
Kharif	18462	26272	44734	109476	64742	2.45
Robi	43015	25385	68399	113973	45574	1.67
Both	77530	73572	151102	690543	539440	4.57
Total	**17977**	**22036**	**40013**	**59846**	**19833**	**1.50**
All						
Aus	18829	22659	41487	66984	25496	1.61
Aman	13444	18433	31878	36756	4879	1.15
Boro	26345	25555	51900	57839	5939	1.11
Kharif	32230	41862	74092	128393	54301	1.73
Robi	28856	18939	47795	83979	36183	1.76
Both	91993	80270	172263	462832	290569	2.69
Total	**24767**	**24717**	**49484**	**58206**	**8722**	**1.18**

5.5 Effects of Floods

As shown in Table 5.4, out of 574 hectares of crop land, 54% were affected by floods in the year before the survey. However, affected land almost entirely included only the rice crop land, as the vegetables crop land, being on higher ground, remained virtually unaffected. Among the three types of rice, the floods affected most the *Boro l*and and least the *Aus* land. Eleven percent of the Boro land was affected by the floods, while the proportion was only 4% for the *Aman* land less 1% for the *Aus* land.

Since the vegetables land was not affected by floods, they obviously had no effects on production of vegetables. Thus, effects of floods were examined only for rice production. Effects of floods on crop production were assessed as yield-losses. Yield- losses were computed as percent of the expected total yield in the sample. The expected total yield is the total yield that would have been received in the sample, had there been no losses due to the floods. The method followed to compute the expected total yield can be seen from Table 5.5. The expected total yield is the total yield actually received plus the yield lost due to the floods. Among the three types of rice, *Boro and Aman*, both, had much bigger losses due to the floods than did *Aus* in the year before the survey. Yield-losses were highest 8.27% of the expected total yield for *Boro* followed closely by *Aman* with 7.01%, while they were lowest 3.41% for *Aus*.

Table 5.4: Crop land affected by floods in the year before the survey

Type of crops	Total crop land	Total flood affected crop land	Percent of crop land affected
Aus	7.60	.07	0.92
Aman	86.73	3.43	3.96
Boro	458.45	50.43	11.00
Kharif	4.59	.00	0.01
Robi	13.71	.00	0.00
Both	3.18	.00	0.00
Total	574.27	53.94	9.39

Table 5.5: Yield-losses due to floods in the year before the survey

Type of crops (Col 1)	Total Yield actually Received (in tones) (Col 2)	Yield lost due to floods (in tones) (Col 3)	Expected total yield (in tones) (Col 4)=(Col2 +Col3)	Yield-loss as percent of expected total yield (Col 5)
Aus	32.85	1.16	34.01	3.41
Aman	214.73	16.18	230.91	7.01
Boro	1902.44	171.40	2073.85	8.27
Total	2150.03	188.74	2338.77	8.07

5.6 Storing of rice

Respondents from households producing rice were asked of the way their households store/preserved their produced rice. Sacks and large bamboo baskets emerged to be the usual means of storing rice from the responses shown in Table 5.6. Sacks as a means of storing ring rice was mentioned by 60% of the respondents and the large bamboo baskets by only a slightly lower 57%. Mentions of granaries were relatively much less infrequent, being at only 28%; this may be due to that they are used only by the big farmers producing large amounts of rice.

As shown in Table 5.7, over two-fourths (44%) of the respondents reported having experienced the loss/perishing of their stored rice. This was usually due to the damages caused by rats and insects. The damages by rats were mentioned by over 80% of the respondents reporting damages of their stored rice, while those by insects were mentioned by nearly 60%. Few respondents mentioned of the damages caused by flood waters, heavy rainfalls or sultry weather.

Table 5.6: Means of storing rice

Means	Number	Percent
Sack	431	59.9
Granary	198	27.5
Large bamboo basket	407	56.6
Large earthen cask	57	7.9
Others	66	9.0
N[1]	**719**	

[1]N is the number of households producing rice.

Table 5.7: Damages of stored rice and the causes

Responses	Number	Percent
Whether rice was damaged		
Yes	319	44.4
No	400	55.6
N[1]	**719**	**100.0**
Causes of damages		
Insects	179	56.1
Rat	261	81.8
Flood water	11	3.4
Heavy rain fall	7	2.2
Sultry wheather	3	0.9
N[2]	**319**	

[1]N is the number of households storing/preserving rice.
[2]N is the number of households reporting damages of rice.

5.7 Modern rice cropping practices

As shown in Table 5.8, farm households almost universally reported using at least one modern rice cropping practice. Only 6% of the households were found to be not using any modern practices. Most commonly used practices were using of *high quality seeds* (Table). Among households using modern practices, 95% mentioned of using *high quality seeds*. Next most commonly used practices were *using of 2-3 seedlings per hill* and *maintaining of proper spacing* (each mentioned by about equal proportions at over 60%) followed by *balanced using of fertilizers* (mentioned by 57%).

Table 5.8: Use of modern rice cropping practices

Responses	Number	Percent
Whether using modern practices		
Yes	679	94.3
No	41	5.7
N[1]	**719**	**100.0**
Specific practices		
Use high quality seeds	644	94.8
Use 2-3 seedling per hill for rice	420	61.9
Maintain proper spacing	417	61.4
Intercropping	12	1.8
Use IPM	46	6.8
Use organic fertilizers	60	8.8
Recommended seed storage methods	5	0.7
Balanced use of fertilizer	388	57.1
Green manure	33	4.9
Others	1	0.1
N[2]	**679**	

[1]N is the number of households producing rice.
[2]N is the number of households using modern practices

6. Homestead gardening

As shown in Table 6.1, half (49%) of households in the project area reported growing vegetables at homestead. Most commonly grown vegetables at the homestead were *Water gourd* and *Ash gourd*. Among households doing homestead gardening, nearly 60% reported growing *Water gourd* in the year before the survey and did over 50% *Ash gourd* (Table 6.1). Next most commonly grown vegetables were *Puishak* (mentioned by 43%), *Chichinga/ Jhinga* (40%) and *Bean* (34%). *Datashak* and *Papaya* were also among the commonl homestead vegetables, grown by substantial proportions of the households at 19-22%.

Table 6.1: Growing of vegetables at homestead

Responses	Number	Percent
Whether growing vegetables at homestead		
Yes	590	49.2
No	610	50.8
N[1]	**1200**	**100.0**
Specific types of vegetables grown in year before the survey		
Water gourd	349	59.2
Radish	27	4.6
Bringal	79	13.4
Lal shak	74	12.5
Ash gourd	312	52.9
Coriander leaf/kalizira/ ginger	4	0.7
Potato/keshur	30	5.1
Data shak	128	21.7
Patal/drum stick	14	2.4
Chichinga/Jhinga	237	40.2
Bean	199	33.7
Pui shak	252	42.7
Green banana	36	6.1
Okra	49	8.3
Green chilli	75	12.7
Onion	10	1.7
Garlic	9	1.5
Sweet potato	8	1.4
Tomato	26	4.4
Bitter gourd	28	4.7
Papaya	114	19.3
Cucumber	44	7.5
Amaranth	65	11.0
Other green leafy vegetables	20	3.4
Others	43	7.3
N[2]	590	

[1]N is the number of households included in the sample.
[2]N is the number of households who grew vegetable at homestead in the tear before the survey.

7. Access to market

Villagers' access to the local market, where they usually sell their agricultural produces, were assessed in terms of its distance from their home, the transportation they usually use to go to it and the costs they usually incur for a two way trip to/from it. As shown in Table 7.1, the average distance of the market from a home in a sample village was estimated to be slightly over 2 miles, with over a half (55%) of the villagers having it located within 2 miles from their home and another 15% having it located at a distance of 2-3 miles from their home. Yet, a significant proportion, nearly 15%, reported the distance of their market from their home at 4 miles or over.

Nearly one-third of villagers reported usually going to the market on foot (Table 7.2). For the others, the commonly used transportations to market were engine boat accounting for 30% of villagers, closely followed by rickshaws with 24%.(Table 7.2) For those using transportations, their average costs for a two way trip for the market were reportedly Taka 33/-, including an expense of no less than Taka 40 for 18 % (Table 7.3).

Forty one percent of households were found to be not selling agricultural produces. Among the respondents selling agricultural produces, most (96%) sold them to the local market (54%) or to a middleman coming to their houses (42%), (Table 7.4). Only 4% reported selling their produces to other than the local market.

Table 7.1: Distance to market

Distance of market (in mile)	Number	Percent
0	390	32.5
1	271	22.6
2	177	14.8
3	192	16.0
4	170	14.2
N[1]	**1200**	**100.0**
Mean distance (in mile)	**2.19**	

[1]N is the number of households included in the sample.

Table 7.2: Means of transportation to market

Means of transportation	Number	Percent
Bus	14	1.2
Motorbike	5	0.4
Rickshaw	290	24.2
Van	12	1.0
Truck	1	0.1
Engine boat/boat	359	29.9
Tempo	95	7.9
Walking on foot	376	31.3
Others	48	4.0
N[1]	**1200**	**100.0**

[1]N is the number of households included in the sample.

Table 7.3: Two way costs of travel to market

Cost of two-way travel market (in taka)	Number	Percent
1-10	207	24.7
11-20	219	26.1
21-30	91	10.9
31-40	169	20.2
41-50	43	5.1
51-100	101	12.1
101-240	8	1.0
N[1]	**838**	**100.0**
Mean cost (in taka)	**32.88**	

[1]N is the number of households using transportation to market.

Table 7.4: Market where agricultural produces were sole

Type of market	Number	Percent
That market	384	53.9
Other market	26	3.7
Wholesalers take away	302	42.4
N[1]	**712**	**100.0**

[1]N is the number of households selling agricultural produces.

8. Education of farmers

As shown in Table 8.1, in 722 (60%) out of 1, 200 households, respondents said they or their husbands were engaged in farming on their own land or others' land. Education of these respondents and their husbands was assessed defining them as female farmers and their husbands as male farmers.

The distribution of female farmers (respondents) by their assessed levels of education is presented in Table 8.2, along with that for male farmers (husbands). There was little disparity in levels of education between female and male farmers, indicating that women were about as likely to receive education as men in the project area. This could be a result of the national efforts trying over decades to popularize female education in the country. Yet, extent of education still remained low among farmers in the project area. Over half of both female (54%) and male farmers (52%) were reported to have never attended any school. Again those who attended school, their highest proportion received an education only up to the completed primary level or below, accounting for 27% of female farmers and male farmers, each. Only few farmers had an education up to the SSC level or above, 3% among female farmers and 6% among male farmers.

Table 8.1: Whether respondents or their husbands were engaged in farming

Whether engaged in farming	Number	Percent
Yes	722	60.2
No	478	39.8
Total[1]		**100.0**
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 8.2: Education of farmers

Levels of education	Female farmers (respondents)	Male farmers (husband)
Never attended school	54.2	52.1
Class I-V	27.4	26.5
Class VI-IX	15.4	15.4
SSC	1.9	3.2
HSC	0.7	1.4
Degree or above	0.3	1.5
Others	0.1	--
Total	**100.0**	**100.0**
N[1]	**722**	**722**

[1]N is the number of farmer households included in the sample.

9. Household Loans

9.1 Receipts and repayments

As shown in Table 9.1, most households in the sample had scopes to obtain loans. Only less than 10% said they could not get a loan from anywhere. Over half (53%) of households reported having received loans in the two years before survey (Table 9.2).

Table 9.3 shows the distribution of the loan recipient households[1] by class intervals of loans they received. The average loan received by a recipient household was Taka 48,161. However, most of the households, nearly 70%, received the loans in small amounts of Taka 30,000 or less. Only 18% reported having had the loans in amounts larger than Taka 50,000.

The likelihood of households repaying loans was assessed in terms of proportions that they had so far paid back of the loans they received in the two years before the survey. The proportions are presented in Table 9.4 by class intervals of the loans received. The proportions were calculated as percents in the following manner. As shown in the table, the mean amount of loans received by households receiving loans in the class interval of Taka 1-5,000 was Taka 3508, and the mean amount of loans so far repaid by them was Taka 1207; thus, the proportion of loans repaid by them was calculated as p= (1207/3508)*100. Similarly, the proportions for the households in the other class intervals as well as for all households together were computed. Based on the given calculations, households were found to have so far repaid, on average, 33% of the loans. There were little variations in repayments by amounts of loans.

Table 9.1: Access to loans

Access	Number	Percent
Scope to obtain loans		
Yes	1098	91.5
No	102	8.5
Total[1]	**1200**	**100.0**

[1]N is the number of households included in the sample.

Table 9.2: Whether ever received loans in the two years before the survey

[1]A loan recipient household is a household reporting receipt of loans in the two years before the survey.

Whether received	Number	Percent
Yes	632	52.7
No	568	47.3
Total[1]	**1200**	**100.0**

[1]N is the number of households included in the sample.

Table 9.3: Loans received in the two years before the survey

Class interval of loans	Number	Percent
1-5,000	49	7.8
5,001-10,000	132	20.9
10,001-20,000	173	27.4
20,001-30,000	80	12.7
30,001-50,000	83	13.1
50,001-75,000	35	5.5
75,001-100,000	29	4.6
100,001+	51	8.1
Total[1]	**632**	**100.0**
Mean loan	**48,160.68**	

[1]N is the number of households having received loans in the two years before the survey.

Table 9.4: Repayments of loans received in the two years before the survey

Class interval of loans	Number	Mean amount of loans received	Mean amount of loans repaid	Proportion (percent) repaid
1-5,000	49	3,508	1,207	**34.4**
5,001-10,000	132	8,672	3,082	**35.5**
10,001-20,000	173	16,634	5,568	**33.5**
20,001-30,000	80	27,074	9,888	**36.5**
30,001-50,000	83	42,194	12,731	**30.2**
50,001-75,000	35	62,786	22,978	**36.6**
75,001-100,000	29	91,741	30,646	**33.4**
100,001+	51	308,180	98,306	**31.9**
Total[1]	**632**	**48,161**	**15,787**	**32.8**

9.2 Sources and uses

As shown in Table 9.5, relatives/friends/neighbours and the NGOs were the two major sources the households received their loans from. Relatives/friends/neighbours were mentioned as a source of the loans by 41% of the loan recipient households. NGOs were also mentioned by almost an equal proportion (40%). Money lenders emerged as the second most common source used by a significant proportion of 15%. The likelihood of households getting loans from a bank was extremely low. Only 4% or even less mentioned a bank as a source of their loans.

As shown in Table 9.6, the households most commonly used the loans to purchase agricultural inputs, next most commonly to purchase food, clothes, etc. Purchasing of agricultural inputs for a use of the loans was mentioned by nearly 40% of the loan recipient households and the purchasing of food, clothes by 30%. The next most commonly mentioned uses of the loans were: meeting treatment/medicine expenses (mentioned by 20%), investing in small businesses (15%), repayment of previous loans (13%), purchasing of agricultural tools and building/repairing of homes. Any other uses of the loans were few, mentioned by 5% or less.

Table 9.5 Sources of Loans

Sources	Number	Percent
Relative/friend/neighbor	260	41.1
NGO	255	40.3
Money lender	94	14.9
Samity (other than NGO)	31	4.9
Bangladesh Krishi Bank	28	4.4
Other Bank	25	4
Shop/dealer/trader	13	2.1
Rajshahi Krishi Bank	5	0.8
Other financial institutes	4	0.6
Other	9	1.4
N[1]	632	

[1]N is the number of households' member who took loan during last 2 years.

Table 9.6: Uses of Loans

Uses	Number	Percent
Purchase of agriculture inputs	238	37.7
Purchase of food, clothes	187	29.6
Treatment/medicine expenses	127	20.1
Small businesses	93	14.7
Payment of loans	85	13.4
Purchase of agricultural tools	75	11.9
Building/repairing of home	61	9.7
Purchase of cattle	33	5.2
Education expenses	28	4.4
Purchase of land	22	3.5
Marriage related expenses	22	3.5
Big business	22	3.5
Going abroad/immigration	19	3
Dowry	5	0.8
Funeral	1	0.2
Religious programs	1	0.2
Others	45	7.1
N[1]	632	

[1]N is the number of households' member who took loan during last 2 years.

9.3 Membership with micro credit group (MCG)

A household to have access to micro credits need be a member of a group of a micro credit a micro credit organization. As such, one of the primary objectives of the baseline survey was to ascertain what proportion of households in the project area currently had membership with a micro credit group, and thereby, access to micro credit.

A household was defined as having membership with a micro credit group if someone from the household was a member of that group. Thus, 28% of households in the project area were found to have had membership with a micro credit group (Table 9.7). Among the different micro credit organizations, the membership was highest with the groups of ASA at 36% of member households, followed in order by Grameen Bank with 29% and BRAC with 19% (Table 9.7). Most member households (96%) reported having taken loan at least once from a group (Table 9.7).

Table 9.7: Information about membership with micro credit groups

Information	Number	Percent
Whether having membership with a group		
Yes	330	27.5
No	870	72.5
N[1]	1200	
Total		100.0
Membership by organization		
Grameen Bank	96	29.1
BRAC	64	19.4
BRDB	15	4.5
ASA	120	36.4
TMSS	4	1.2
Other organization	105	31.8
N[2]	252	
Whether having ever taken loan		
Yes	316	95.8
No	14	4.2
N[2]	330	
Total		100.0

[1]N is the number of households included in the sample.
[2]N is the number of member households included in the sample.

10. Fishing and fish cultivation

A major objective of the HILIP project will be to improve the livelihood of poor rural households engaged in fishing by improving their access to fish resources in the water bodies or Jalmoholas in the Haor region. Efforts would also be taken to improve increases in fish production and the fish species in the water bodies, and strengthen the BUGs (Bill Unnayon Groups) formed under SCBRMP, providing them improved skills and knowledge of fishing in the water bodies.

A range of data was collected in the baseline survey as to the current situations of fishing and fish cultivation in the project area. These data are expected to be used in the follow-up survey to evaluate the project's success in improving the water resources and the households' access to them.

As shown in Table 10.1, a large proportion of households, about 45%, were engaged in fishing. Only few (less than 3%) of households reported doing fish culture/cultivation. Data on fish culture/cultivation is therefore excluded from discussions in this report.

Fishing was usually done in water bodies such as haors, marshes and rivers, but most commonly in haors (Table 10.2). Among households engaged in fishing, 61% mentioned of haors as a place of fishing, while the proportion was lower as 56% for marshes and further lower as 47% for rivers. Only a quarter of the households reported canals as a place of fishing.

Only a small 11% of households fishing in the water bodies were found to be fishing in them with permission (Table 10.3). This is because, most (85%) of the households thought there was no permission needed to fish in the water bodies (Table 10.3).

. **Table 10.1: Whether engaged in fishing or fish culture/cultivatin**

Whether engaged	Number	Percent

Fish culture/cultivation	22	1.8
Fishing	532	44.3
Both	20	1.7
None	626	52.2
Total		**100.0**
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 10.2: Places of fishing

Places	**Number**	**Percent**
Canal	136	24.6
River	259	46.9
Marshland	308	55.8
Haor	338	61.2
Water land	13	2.4
Pond	25	4.5
N[1]	**532**	

[1]N is the number of households engaged in fishing.

Table 10.3: Responses regarding permission of fishing in the water bodies

Responses	**Number**	**Percent**
Whether needed permission		
Needed	84	15.4
Not needed	460	84.6
Total		**100.0**
N[1]	**544**	
Whether having permission		
Yes	61	11.2
No	483	88.8
Total		**100.0**
N[1]	**544**	

[1]N is the number of households who reported fishing in the water bodies.

As shown in Table 10.4, fish caught in the water bodies usually included small types such as *Puti, Tengra* and *prawn*. Over 90% of households, who were engaged in fishing, mentioned of *Puti* as a type in their catches (of fish), 76% of *prawn* and 71% of *Tengr*a. *Mola/Dhela*, another small type of fish was also mentioned as a catch by a significant proportion of 28%. After the small types, next most commonly caught types of fish were *Koi* (mentioned by 28%), *Soal/Taki* (28%), Boal*/Aier*(18%) and *Catfish* (16%). Types of large fish such as Ruhi, Katla as catches were infrequently mentioned at 6% or below.

Table 10.4: Types of fish caught in the water bodies

	Number	Percent
Ruhi	33	6.0
Katla	22	4.0
Mrigel	8	1.4
Tilapia	21	3.8
Carp	15	2.7
Catfish	86	15.6
Koi	156	28.3
Boal/aier	100	18.1
Soal/taki	155	28.1
Tengra	395	71.6
Pabda	47	8.5
Mola/dhela	154	27.9
Prawn	418	75.7
Puti	512	92.8
Other small fish	307	55.6
Others	32	5.8
N[1]	532	

[1]N is the number of households who catch fish.

Awareness of BUGs (Beel Unnayon Groups) was low. Only 10% of households engaged in fishing acknowledged that there was a BUG in their locality (Table 10.5). Again among those aware, only few (less than 6%) reported having membership with a BUG (Table).

Table 10.5: Awareness of and membership with BUGs

Responses	**Number**	**Percent**
Whether aware of a BUG		
Yes	53	9.7
No	491	90.3
Total		100.0
N[1]	544	
Whether member of a BUG		
Yes	3	5.7
No	50	94.3
Total		100.0
N[2]	53	

[1]N is the number of households engaged in fishing.
[2]N is the number of households aware of a BUG.

11. Domestic animals' vaccination rates and death rates

A major effort in the project will be assisting households take improved care of their domestic animals. As a result of this effort, vaccination rates, among other things, are expected to improve among domestic animals in the project area, reducing their mortality protecting them from preventable diseases. Thus, a primary objective of the baseline survey was to establish the current levels of the vaccination and death rates of domestic animals in the project area in order to assess changes in these rates in the follow-up survey.

As shown in Table 11.1, total number of cows/buffaloes found in current possessions of households in the sample was 1,510, while the total number that died in the year before the

survey in the sample was 194 and the total number that was sold was 242. Thus, households in the sample were found to have had, on average, a total of (1,510 + 194 + 242)/2 or 1,728 cows/buffaloes in possessions during the year before the survey. Using this average total, yearly death rates of cows/buffaloes were calculated as (194/1,728)*100 or 11.2% and their yearly vaccination rates as (/1,728)*100 or 24.2%. Similarly the rates for other types of animals were computed. The calculated death and vaccination rates are also provided in Table 11.1.

Death rates were high among domestic animals. Forty-seven percent of chickens/ducks in the sample were found to have died in the year before the survey, along with 34% of goats/sheep (Table 11.1). Death rates of cows/buffaloes were though considerably lower, yet they were over 10%.

The likelihood of domestic animals being vaccinated was low (Table 11.1). According to the calculated vaccination rates, only 21 percent of chickens/ducks were found to have been given vaccines in the year before the survey, while the proportion was only slightly higher as 24% for cows/buffaloes. Vaccination rates were worst for goats/sheep, being at only 7 percent.

Data were also collected on frequencies of vaccinating domestic animals to ascertain the current vaccination practices. The distribution of households by their frequencies of vaccinating animals of a specific type is presented in Table 11.2. Given the low rates of vaccination, it is obvious that most households did not vaccinate their domestic animals.

Among households raising cows/buffaloes, 72% reported having not given any vaccine to the animals in the year before the survey. The proportion was even worse for chickens/ ducks and goats/sheep, being further up at 88 percent for each. Again those who said had given vaccine to their animals, they mostly did it only once in the year.

Table 11.1: Mortality rates and vaccination rates among domestic animals by type of animals in the year before the survey

Type of domestic animals	Number died	Number sold	Number currently possess-ed	Estimated average number possessed	Death rates	Number vaccina-ted	Vaccina-tion rates
Cows/Buffaloes	194	242	1,510	1728	11.23	422	24.42
Goats/Sheep	86	57	179	251	34.33	16	6.37
Ducks/Chickens[2]	5,512	1,516	5,360	8,874	62.11	1,870	21.07

[2]Note that the death and vaccination rates of chickens/ducks and their other estimates presented in the report were constructed excluding the households raising more than 50 birds, because such households were raising chickens/ducks as or like poultry firms and their raising practices and experiences were likely to bias the findings masking the true practices and experiences of the households raising chickens./ducks as an ordinary activity.

Table11.2: Frequencies of vaccinating domestic animals by type of animals in the year before the survey

Frequencies of vaccinating	Cows/buffaloes	Goats/sheep	Chickens/ducks
Once in a month	0.6	0.0	0.4
Once in three months	1.2	0.0	1.3
Once in six months	9.4	2.8	3.6
Once in a year	16.8	9.7	6.7
Vaccine not given	72.1	87.5	87.9
Total	**100.0**	**100.0**	**100.0**
N[1]	**513**	**721**	**744**

[1]N is the number of households raising a specific type of animals.

12. Access to information and assistance

Facilitating and enhancing access to the information and assistances on agriculture, livestock raising, vegetable growing/gardening, and fish cultivation is a prime activity of the HILIP project to help raise households' productivity in the project area. Current situations as to access to the information and assistances were assessed in the baseline survey by asking respondents if they knew of the sources they could get the information and assistances from and if they ever received any information and assistances from a source.

As shown in Table 12.1**,** slightly over half (52%) of respondents reported knowing of sources they could get the information and assistances from on agriculture/livestock raising/vegetable growing/ gardening/ fish cultivation. Agricultural department emerged to be the most known source of the information and assistances, distantly followed in order by fishery department and livestock department (Table 12.2). Nearly 73% of respondents who knew of sources mentioned knowing of agricultural department as a source of information and assistances, while the proportions were only 40% for fishery department and 30% for livestock department. The variations in the awareness of the three departments seem to suggest that there were more people having an interest in the information and assistance from agricultural department than from fishery department, and more people from fishery department than from livestock department. Neigbours/ relatives/ other farmers also emerged as an important source of information and assistance, mentioned of by a proportion as large as over two-fifths (44%).

Table 12.1: Whether aware of sources of information and assistances

Whether aware	Number	Percent
Yes	619	51.6
No	581	48.4
Total		**100.0**
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 12.2: Awareness of specific sources of information and assistances

Sources	Number	Percent
Neighbors/relatives/other farmers	274	44.3
Agriculture department	453	73.2
Fishery department	246	39.7
Livestock department	185	29.9
NGO	75	12.1
Seed and pesticide company	37	6.0
Drug company for fish, cattle and poultry	48	7.8
Total		**100.0**
N[1]	**619**	

[1]N is the number of households who knew of sources of information and assistance.

Referring to a specific source, respondents were asked if their households had ever received any type of assistance from it. The results given in Table 12.3 show that few households had ever received any assistance from a source except the source of neighbours/relatives/other farmers. Nearly 30% of respondents reported that their households had received assistances from neighbours/relatives/other farmers, while the proportion was only 12% or below for any other sources. Among those who reported receipt of assistances, 76% mentioned having received ocash assistance in response to the question “What type of assistance did you receive?”, as shown in (Table 12.4). Next most commonly received assistances were the suggestion/information regarding the use of high quality seeds (mentioned by 36%), proper use of fertilizer (20%), use of pesticide (14%) and weed control (11%).

Respondents were asked about what types of assistances were required, on a priority basis on agriculture, cattle raising fish cultivation, vegetable growing/gardening, etc. In reply, an overwhelming majority, at 86%, mentioned *assistance with cash*, along with mentions of *assistance with loan* by 42% (Table 12.5). Other commonly sought assistances included *assistance with seeds* mentioned by 51%, and assistance with fertilizer mentioned by 44%.
.

Table 12.3: Assistances received from specific sources

Sources	Number	Percent
Neighbors/relatives/other farmers	337	28.1
Agriculture department	104	8.7
Fishery department	23	1.9
Livestock department	21	1.8
NGO	151	12.6
Seed and pesticide company	20	1.7
Pharmaceuticals company for fish, cattle and poultry	8	0.7
Others	55	4.6
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 12.4: Types of assistances received

Types of assistances	Number	Percent
Use high quality seeds	161	35.6
Proper use of fertilizer	89	19.7
Weed control	48	10.6
Use of pesticides	61	13.5
Prepare and use organic fertilizer	11	2.4
Pest control in organic system	23	5.1
Domestic cattle fattening method	11	2.4
Fish disease management	5	1.1
Equipment	27	6.0
Cash assistance	343	75.9
Others	5	1.1
N[1]	**452**	

[1]N is the number of households reporting receipt of assistances.

Table 12.5: Types of assistances required

Types of assistances	Number	Percent
Cash assistance	978	81.5
Loan assistance	503	41.9
Seed	610	50.8
Fertilizer	532	44.3
Irrigation	208	17.3
Pesticide	142	11.8
Agriculture equipment	150	12.5
Dried food for livestock	20	1.7
Veterinary assistance	98	8.2
Fishing equipments	152	12.7
Others	66	5.5
N[1]	**1200**	

[1]N is the number of households included in the sample.

13. Employment status of women

Generating employment for women is a core objective of the HILIP project. Current employment status of women aged 12 or over in the project area was assessed in the baseline survey as bench mark estimates to be used in the follow-up survey in gauging the project success in generating women employment.

As shown in Table 13.1, only about a quarter (26%) of households in the project area had employed women at ages 12 and above, being engaged in income earning activities in the year before the survey as a salaried or self-employed person. Among the households with employed women, most (90%) had only one employed women, as shown in Table 13.2. Thus there were a total of 307 employed women found in the total sample. Percentages of employed women reported to be engaged in a specific activity are shown in Table 13.3. Note that there some women engaged in more than one activity. Nearly a half (48%) of employed women were reported to have been engaged in engaged in *poultry raising* in the year before the survey, ranking it the major female occupation in the project area. Next most commonly reported female activity was *cow raising* (for milk) reported for 30%, followed by *cattle fattening* with 10%, and *tailoring* and *day loabour*, each with 6%.

Table 13.1: Whether a household had employed women at ages 12 and over in the year before the survey

Whether having	Number	Percent
Yes	307	25.6
No	893	74.4
Total[1]		**100.0**
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 13.2: Households by number of employed women at ages 12 and over in the year before the survey

Number employed	Number	Percent
1	275	89.6
2	26	8.5
3	6	2.0
Total	**307**	**100.0**

Table 13.3: Employed women at ages 12 and over in the year before the survey by specific activity

Activity	Number	Percentage
Poultry raising	166	48.1
Cow rearing (milk)	101	29.3
Cow fattening	35	10.1
Tailoring	23	6.7
Day labour	23	6.7
Fruit/vegetables selling	21	6.1
Goat rearing (include buck rearing)	16	4.6
Domestic worker	16	4.6
Other small business	6	1.7
Salaried job	6	1.7
Fish culture/cultivation	5	1.4
Bamboo handicrafts (includes basket, hand fans and pottery)	4	1.2
Rice husking	3	0.9
Rice threshing	3	0.9
Sheep rearing	1	0.3
Begging	1	0.3
Others	11	3.2
N[1]	**345**	

[1]N is the number of women engaged in income earning activities.

14. Women's empowerment and autonomy

Enhancing women's empowerment and autonomy is an important underlying intent of the HILIP project. The following information was collected in the baseline survey to help plan and evaluate the project activities geared towards women's empowerment and autonomy.

- Women's involvement in decision making concerning her household's financial matters such as buying of household's daily necessities, making of big purchases and making o big sales.

- Women's autonomy to spend her earnings, to seek treatment when she gets sick and to visit the houses of her parents, relatives and friends.

- Women's involvement in decision making about wedding of her children and about seeking of health services for their children.

14.1 Decisions about financial matters

As the data in Table 14.1 show, decisions about financial matters were taken jointly by husband and wife in majority of households in the project area, indicating an improved status of wife having a say in the management of the family. In 62% of households, decisions about purchases of household's daily necessities were reported as taken jointly by husband and wife. The portions were also about the same for the decisions about household's big sales (61%) and big purchases (60%). However, in a substantial minority of households, financial decisions were taken by all family members together, instead of only husband and wife: for big sales in over one-fourth (27%) of households, for big purchase also in over one-fourth (26%) and for purchases of daily necessities in over two-fifths (21%).

14.2 Decisions about wife's personal matters

As shown in Table 14.2, women did not have the full control over the spending of their earned incomes in the project area. In most of the households, over 80%, respondents mentioned of husband and wife deciding jointly about how the wife's incomes be spent. Only in less than 10% of the households, a wife had the absolute right to spend her incomes based on her own decisions.

Table also presents the data on women's freedom to seek treatment when they become sick as well as on their autonomy to visit the houses of their parents, relatives and friends when they wish. Women generally were not free to seek treatment for their illness. In three quarters (75%) of the households, it was mentioned, when a wife became sick, she is to consult her husband in deciding to seek treatment for the illness. A more worrying finding was that, in more than 10% of the households, it is the husband alone deciding if to seek treatment for the wife's illness.

Women also had restricted freedom to move out of their home. In over three quarters (77%) of the households, respondents mentioned of both husband and wife jointly deciding if she would go visit the houses of her parents, relatives and friends. Behind the joint decision, in most cases, it might be that wife was asking for the husband's permission to undertake the visit .

14.3 Decisions about matters concerning children

A woman appeared to have the same say as her husband in majority of households in the project area in making decisions about matters related to their children. As shown in Table 14.3, respondents mentioned of both husband and wife taking decisions together regarding wedding of their children in 60% of the households, regarding seeking of immunization services for the children in 72% and regarding seeking of treatment for the illness of the children in 78%.However, decisions about wedding of children in many a family were found dependent on people outside the family. Outside people were mentioned as decision makers for wedding of children in as many as one third of the households.

Table 14.1: People involved in making decisions about a household's financial matters

People involved	Household's financial matters		
	Purchases of household's daily necessities	Making of household's big purchases	Making of household's big sales
Wife	4.8	3.1	2.8
Husband	7.8	8.3	7.5
Husband/wife together	62.1	60.3	61.0
All family members	21.5	26.1	26.5
Other persons	.5	.4	.4
Others	3.4	1.8	1.8
Total	**100.0**	**100.0**	**100.0**
N[1]	**1,200**	**1,200**	**1,200**

[1]N is the number of households included in the sample.

Table 14.2: People involved in making decisions about a wife's personal matters in a household

People involved	Wife's personal matters		
	Spending of wife's incomes	Seeking of treatments for wife's illness	Wife's visit to the houses of her parents/relatives/friends
Wife	8.8	4.7	4.8
Husband	6.2	12.0	9.9
Husband wife together	81.3	74.8	77.0
Other person	3.7	1.8	1.5
Others	--	6.7	6.8
Total	**100.0**	**100.0**	**100.0**
N[1]	**513***	**1,200**	**1,200**

[1]N is the number of households included in the sample.
* Here N includes only those households where wife had an income

Table 14.3: People involved in making specific decisions about matters concerning children in a household

People involved	Specific decisions about children		
	Wedding of children	Treatments for children	Immunizations of children
Wife	2.8	5.5	12.1
Husband	2.6	6.7	6.3
Husband/wife together	60.4	78.2	71.8
Other person	1.7	1.6	1.4
People outside family	32.6	8.1	8.3
Total	**100.0**	**100.0**	**100.0**
N[1]	**1,200**	**1,200**	**1,200**

[1]N is the number of households included in the sample.

15. Capacity building

Under the HILIP project, efforts will be given to strengthening the existing associations/societies such as *Krishi Samity*, *Cooperative society*, *Fishery Samity*, *Ban Unnayan Samity*, etc in order to build up and enhance the capability of the beneficiaries to improve their livelihood. But the baseline data collected about these societies show that few households had membership with such societies except for Savings groups (Table 15.1). Even for savings societies, the membership was found limited to only 10% of households. So, the primary task of the project will be to encourage people to have membership with such societies in their locality.

Table 15.1: Membership with local societies

Local socities	Number	Percent
Krishi samity	8	0.7
Cooperative	29	2.4
IGA samity	1	0.1
Fisher samity	13	1.1
Ban Unnayan Samity	1	0.1
Savings group/	120	10.0
Chanchaye Samity	1	0.1
Mothers samity/group	24	2.0
Gram Unnayan Samity	16	1.3
N[1]	1200	

[1]N is the number of households included in the sample.

16. Health services

16.1 Awareness of and access to health service centres

As shown in Table 16.1, respondents almost universally reported having health services centres in their locality. Only 5% did not. Specific types of health services centres, reported as available in a locality, are presented in Table 16.2. Most commonly reported health centres available in a locality were pharmacies followed by chambers of traditional doctors. Seventy-five percent of the reporting respondents mentioned of pharmacies among the available health centres in their locality, and 52% of chambers of traditional doctors. Predominance of pharmacies and traditional doctors in the provision of health services at local levels in the project area is due to non-availability of MBBS (qualified) doctors in most localities. Only 23% of the respondents mentioned of the availability of chambers of MBBS

doctors in their locality. Upazila health centre, union health and family welfare centre, and community clinic were also less frequently mentioned as the local health services centers, plausibly because many respondents were not aware of those health centres or they did not view them as their local health centres being located in places outside their perceived locality. Only 40% mentioned of upazila health centres as their local health centres, 33% of union health and family welfare centres and 25% of community clinics.

Table 16.1: Whether having health services centres in the locality

Whether having health centres	Number	Percent
Yes	1140	95.0
No	60	5.0
Total		**100.0**
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 16.2: Reported health centres in the locality

Health centres	Number	Percent
Government district hospital	145	12.7
Upazila health centre	457	40.1
Union health and family welfare centre	379	33.2
NGO permanent centre	24	2.1
Community clinic	281	24.6
Private clinic/hospital	110	9.6
Chamber of MBBS doctor	264	23.2
Chamber of traditional doctor	593	52.0
Pharmacy	853	74.8
Others	25	2.2
Total[1]		**100.0**
N[1]	**1140**	

[1]N is the number of respondents reporting having health centres in the locality.

16.2 Sources for seeking health and family planning services

Most common sources of seeking treatment for illness in the project area were pharmacies followed by upazila health centres and chambers of traditional doctors. As shown in Table 16.3, about three-quarters (74%) of respondents mentioned of pharmacies as a source of seeking treatment when they or any members of their household fell sick, while the proportions was over a half (55%) for upazila health centres and nearly a half (48%) for traditional doctors. People were less likely to seek treatment from any other health providers. MBBS doctors as a source of seeking treatment were mentioned of by only 28% of respondents, union health and family welfare centres and Government district hospitals, each, by 19% and community clinics by 12%. When separately asked about sources of family planning services, health workers emerged to be the most common source of obtaining those services in the project area (Table 16.4). About three quarters of respondents mentioned of health workers as a source of obtaining family planning services/supplies. Next most common sources of family planning services emerged to be pharmacies mentioned of by 27%, followed by upazila health centres with 22% and union health and family welfare centres with 15%.

Table 16.3: Sources of seeking treatment for illness

Sources	Number	Percent
Government district hospital	222	18.5
Upazila health centre	656	54.7
Union health and family welfare centre	233	19.4
NGO permanent centre	18	1.5
Community clinic	138	11.5
Private clinic/hospital	108	9.0
Chamber of MBBS doctor	320	26.7
Chamber of traditional doctor	571	47.6
Pharmacy	884	73.7
Others	11	0.9
N[1]	**1200**	

[1]N is the number of households included in the sample.

Table 16.4: Sources of seeking family planning services

Sources	Number	Percent
Government district hospital	23	1.9
Upazila health centre	269	22.4
Union health and family welfare centre	178	14.8
NGO permanent centre	4	0.3
Community clinic	98	8.2
Private clinic/hospital	12	1.0
Chamber of MBBS doctor	68	5.7
Chamber of traditional doctor	131	10.9
Pharmacy	329	27.4
Health worker	886	73.8
N[1]	**1200**	

[1]N is the number of households included in the sample.

Climate and Livelihood Protection (CALIP)

1. Village Protection

Villages in the survey region generally are affected by currents/waves during monsoon. As shown in the following Table 1.1, this became evident with most households (90%) in the sample reporting that their villages are affected by currents/waves during monsoon season. Only 10% of households were from villages not affected by currents/waves.

Table 1.1: Affect on villages by the current/wave (afal) during monsoon season

Category	No. of HHs	Per cent
Affected	1086	90.50
Not affected	114	9.50
Total	**1200**	**100.00**

n = 1200

Surrounded by the monsoon water from all sides, the villages of haor areas experienced the current/wave flows from all directions (east, west, south and north) but most commonly from the east of villages. As shown in the Table 1.2, 42% of households reported of the direction of current/wave flow from east, while the proportions were 25% for west, 21% for north and 28% for south.

Table 1.2: Direction of the current/wave flow

Direction from	No. of HHs	Per cent
East	506	42.17
West	302	25.17
North	258	21.50
South	342	28.50
North-east	103	8.58
North-west	93	7.75
South-east	189	15.75
South-west	85	7.08

n = 1200. Multiple answers

Over last 10 years, the height and speed of the current/wave in the haor areas have decreased as stated by the majority (63%) of the households in Table 1.3. Other forms of changes or no changes in the height and speed were mentioned by only small proportion at 11% - 14%.

Table 1.3: Changes in the height and speed of the current/wave over last 10 years

Category	No. of HHs	Per cent
No change in height and speed	148	12.33
Height increased but no change in speed	134	11.17
Both height and speed increased	165	13.75
Both height and speed decreased	753	62.75
Total	**1200**	**100.00**

n = 1200

In the haor areas, generally people do not take care annually for protecting their

households against wave action. It is evident from the Table 1.4 that only one third (28%) of the households took protective care for their house/homestead against wave action during last year.

Table 1.4: Protective care for house and homestead against the wave/current action during last year

Category	No. of HHs	Per cent
Took protective care	334	27.83
Did not take protective care	866	72.17
Total	**1200**	**100.00**

n = 1200

Among those who took care as shown in the Table 1.5, a large proportion of households (63%) spent between Tk.50 to Tk. 5,000. But a small proportion (16%) took protective care without spending any cash money but with the help of their family members as well as materials used for free of costs. At the same time, 8% spent between Tk. 5,001 to Tk. 7,500, 6% spent between Tk. 7,501 to Tk. 10,000, 3% spent Tk. 10,001 to Tk. 15,000 and 4% spent less than Tk. 15,000.

Table 1.5: Spending in cash and kind for protecting the home and homestead during last year against the current/wave

Spending range	No. of HHs	Per cent
Did not spend cash money, family members did the repair work ad used materials free of cost	52	15.57
Tk.50 – 5000	211	63.17
Tk5001 – 7500	27	8,08
Tk.7501 – 10000	20	5,99
Tk.10001 = 15000	9	2.70
>Tk.15000	15	4.49
Total	**334**	**100.00**

n = 334

In the haor areas, majority of the households (63%) used two types of material for protecting households including (i) mud, bamboo and Challia grass (36%) and (ii) mud, bamboo and Dholkalmi (27%). Other materials were also used including only mud by 21%, mud & brick by 7% and tin by 4%.The materials used by the households are given in Table 1.6.

Table 1.6 Materials used for protecting the home and homestead against the current/wave

Type materials used	No. of HHs	Per cent
Only mud	71	21.26
Mud, Bamboo and Chaillah Grass	120	35.93
Mud, Bamboo and Dholkalmi	91	27.25
Mud and Brick	25	7.48
Wood	1	0.30
Tin	14	4.19
Others	12	3.59
Total	**334**	**100.00**

n = 334

In the haor areas, repairing frequency of homestead on every year was 40%, after every two years was 15%, after every three years was 9% and after every five years 22%. There were, however, 14% households who had permanent protection with bricks. The detailed repairing frequencies of homestead are given in the Table 1.7.

Table 1.7: Frequency of repairing works for protecting the homestead against the current/wave

Frequency of repairing	No. of HHs	Per cent
Every year	483	40.25
After every two years	183	15.25
After every three years	108	9.00
After every five years	263	21.92
Homestead with permanent protection with bricks	163	13.58
Total	**1200**	**100.00**

n = 1200

Korus and some other tree species grow and thrive well in the haor areas that help protect homestead from erosion. Table 1.8 below gives the number of HHs providing information about the plant species in the haor region.

In the hoar areas, majority of villages were not protected by planting Koros or Herbs in one side or all sides (surrounding) of villages against current/wave. It is evident from the Table 1.8 that 65% households reported that their villages were not protected and 35% reported that their villages were protected against current/wave by planting Koros or Herbs.

Table 1.8: Protection of the villages by planting Koros or Herbs against the current/wave

Planting of Koros or Herb for protection the village against the current/wave	No. of HHs	Per cent
Yes	418	34.83
No	782	65.17
Total	**1200**	**100.00**

n = 1200

Majority of the households (61%) reported as per the Table 1.9 that the planted protective Koros or Herbs were more than 10 years old followed by 33% per cent reported that the age between 5 to 10 years and 6% reported the age as less than 5 years.

Table 1.9: Age of the planted Koros or Herbs

Category of age of the trees/plants	No. of HHs	Per cent
Less than 5 years	26	6.22
5 -10 years	139	33.25
More than 10 years	253	60.53
Total	**418**	**100.00**

n = 418

2. Livelihood Protection

As shown in Table 2.1, majority (74%) of households did not alter the time in selecting and sawing/planting crops. Only 26% reported having altered the time.

Table 2.1: Time altered in selecting and sawing/planting crops

Time altered	No. of HHs	Per cent
Yes	309	25.75
No	891	74.25
Total	**1200**	**100.00**

n = 1200

In haor areas, 53 varieties of rice are produced during boro season as reported in Table 2.2. The most commonly produced varieties are BR-29 (produced by 84% of households) and BR-28 (81%). The next most varieties included Hira Dhan (6%), Gachhi (3%), Boro (3%), BR-19 (2%) and Hira-5 (2%). Other varieties were grown by few households (less than 2%).

The mean duration of maturity for the most commonly produced rice varies from 128 days to 177 days. The mean duration of maturity for specific varieties were for: BR-29 144 days, for BR-28 128 days, for Hira Dhan 156 days, for Gachhi 143 days, for Boro 128 days, for BR-19 141 days and Hira-5 177 days. The mean duration of maturity given in the table for other varieties should be dealt with caution as these are unstable estimates based on fewer than 30 cases.

Table 2.2: Varieties of rice cultivated and their duration of maturity during boro season

Name of rice varieties	Households reporting		Mean duration of maturity in days
	No. of HHs reporting	Per cent of HHs	
BR-29	1008	84.00	144.2
BR-28	971	80.92	128.5
Hira Dhan	103	8.58	156.3
Gachhi	39	3.25	134.1
Boro (local?)	33	2.75	128.5
BR-19	28	2.33	141.8
Hira 5	24	2.00	177.5
Hira 1	23	1.92	176.1
Paijam	10	0.83	141.5
BR-32	7	0.58	137.1
BR-22	5	0.42	132.0
Hira 2	4	0.33	157.5
Bashta Irri	4	0.33	137.5
BR-5	4	0.33	146.3
Sazzad	3	0.25	90.0
BR-41	3	0.25	151.7

Name of rice varieties	Households reporting		Mean duration of maturity in days
	No. of HHs reporting	Per cent of HHs	
Rata	3	0.25	148.3
Lal Dhan	3	0.25	135.0
Kola	3	0.25	140.0
BR -11	3	0.25	138.3
Chandra Shail	3	0.25	121.7
Miniket	3	0.25	108.3
Bowya	3	0.25	150.0
Dalkuri	3	0.25	101.7
Birai	2	0.17	105.0
Mongal	2	0.17	150.0
Lakhai Dhan	2	0.17	105.0
Irri	2	0.17	145.0
Laita Shail	2	0.17	90.0
Hasim	2	0.17	155.0
BR-26	2	0.17	150.0
Mala	2	0.17	150.0
Khasa	2	0.17	140.0
Agani	2	0.17	180.0
Gazi Br-14	1	0.08	165.0
Hasa Dhan	1	0.08	120.0
Agrahi	1	0.08	150.0
Komji	1	0.08	180.0
Gharchara	1	0.08	120.0
Lalmoti	1	0.08	150.0
BR-46	1	0.08	150.0
Pasho Shail	1	0.08	120.0
BR-39	1	0.08	180.0
Tepi	1	0.08	120.0
Parchan	1	0.08	120.0
Chapalla	1	0.08	160.0
Sonora	1	0.08	120.0
Anam	1	0.08	145.0
HB-Hira	1	0.08	180.0
Aftab	1	0.08	170.0
Biplab	1	0.08	180.0
Boro Abjee	1	0.08	90.0
Dinai	1	0.08	150.0

n=1200 Multiple answers

In haor areas, most of the households (78%) do not own bamboo stand. As shown in Table 2.3, only 22% households own bamboo stand.

Table 2.3: Ownership of bamboo bush/stand

Category	No. HHs	Per cent
Do not own bamboo stand	932	77.67
Own bamboo stand	268	22.33
Total	**1200**	**100.00**

n = 1200

In haor areas, most of the household (90%) also do not own Murta (bet, barabet – *Calamus viminalis)* as shown in Table 2.4, only 10% households own Murta.

Table 2.4: Ownership of murta bush

Category	No. of HHs	Per cent
Do not own murta bush	1084	90.33
Owned murta bush	116	9.67
Total	**1200**	**100.00**

n = 1200

In haor areas, Dholkalmi was the most commonly available grass (91%) in the villages or adjacent villages as shown in table 2.5. In addition to that, the other available grasses were Binna (66%), Chamila (62%) and Ekor (50%).

Table 2.5: Availability of grass/plants in the village or adjacent villages

Types of grass	No. of HHs	Per cent
Dolkalmi	1093	91.08
Binna	788	65.67
Chailla	739	61.58
Ekor	596	49.67
Other grass	277	2.31

n = 1200 Multiple answers

In haor areas, majority (95%) of the households as reported in Table 2.6 do not own any of the above mentioned grass. Only 5% reported that they won any of the above mentioned grass.

Table 2.6: Ownership of one or more of the above mentioned grasses/plants

Category	No. of HHs	Per cent
Do not own any of the above mentioned grasses	1136	94.67
Own one or more of the above mentioned grasses	64	5.33
Total	**1200**	**100.00**

n = 1200

Among the 64 households, the current market price range of own grass was from Tk. 0 to 200+. As shown in Table 2.7, 33% households reported the price range from Tk. 0 to Tk. 100, 36% reported price range from Tk. 101 to Tk. 200 and 31% reported Tk. 200+.

Table 2.7: Range of current market price for the grasses

Range of market price	No. of HHs	Per cent
Tk.0 – 100	21	32.8
Tk.101 – 200	23	35.9
Tk. 200+	20	31.3

n = 64

3. Early Flash Flood Warning and Occurrences of Flood

Flash flood is a recurrent threat to crops and homesteads in the haor region. Flash flood, in particular, destroys the Boro crop, in addition to other damages. In this context household possessions were surveyed to assess the level of poverty as well as their preparedness for the disaster.

The households were asked about the possessions of some selected items. Table 3.1 shows that in haor areas, mobile phones (81%), mobile phones with radios (34%) and televisions (24%) were common communication and information devises possessed by most households. The other items were country boat (13%), solar electricity (17%) and radio (4%).

Table 3.1: Household possessions of some selected items

Possession	No. of HHs	Per cent
Country boat	152	12.67
Television	289	24.08
Solar electricity	207	17.25
Radio	48	4.00
Mobile phone	976	81.33
Mobile phone with radio	414	34.50

n = 1200 Multiple answers

The households were also asked about the same selected possessions of other families of their villages. Table 3.2 shows that almost all the other families possess mobile phones (99%), mobiles with radios (87%), televisions (98%), country boats (92%), solar electricity (74%) and radios (63%).

Table 3.2: Possessions of other families of the village

Possession	No. of HHs	Per cent
Country boat	1101	91.75
Television	1171	97.58
Solar electricity	890	74.17
Radio	762	63.50
Cell phone	1191	99.25
Cell with radio	1049	87.42

n = 1200 Multiple answers

In Haor areas, majority (63%) of the people receive advance information routinely regarding flash flood. It is evident from Table 3.3 that only 37% people do not receive advance information regarding flash flood.

Table 3.3: Receiving of advance information regarding flash flood routinely

Category	No. of HHs	Per cent
Receive advance information regarding flash flood	755	62.92
Do not receive advance information regarding flash flood	445	37.08
Total	**1200**	**100.00**

n = 1200

In Haor areas, majority (70%) of the households reported that the flash flood did not occur during the last five years. Table 3.4 also shows that only 30% reported that flash flood occurred during the last five years.

Table 3.4: Occurrence of flash flood during the last five years

Category	No. of HHs	Per cent
Occurred flash flood during the last five years	355	29.58
Did not occur flash flood during the last five years	845	70.42
Total	**1200**	**100.00**

n = 1200

Among the households reported the occurrence of flood, majority (38%) reported that the flood occurred before ripening of paddy. As shown in table 3.5, the next most majority (31%) reported occurrence of flood after ripening of paddy. Flood also occurred after planting paddy (26%), after ripening of paddy but before completing harvesting of paddy due to unavailability of labour (13%) and after ripening of paddy but could not be transported home in time (3%)

Table 3.5: Households reporting on the time of occurrence of flash flood

Time of occurrence of flash flood	No. of HHs	Per cent
After planting paddy	92	25.92
Before ripening of paddy	135	38.03
After ripening of paddy	109	30.70
After ripening of paddy but before completing harvesting of paddy due to unavailability of labour	48	13.52
After ripening of paddy but could not be transported home in time	10	2.82

n = 355 Some multiple answers.

3.1 Damage of crops

Among the households (30%) who had experienced of flash flood over last five years, majority (69%) of them had no damage of paddy by flood, 8% had 51-99% damage and 4% had 11-20% damage. But as shown in Table 3.6, only 4% had total damage of paddy.

Table 3.6: Damage of paddy by flood of those who had experienced flash flood over last 5 years

Extent of damage	No. of HHs	Per cent
Not damaged by flood	244	68.73
1 – 10%	3	0.85
11 – 20%	14	3.94
21 – 50%	52	14.65
51 – 99%	28	7.89
100%	14	3.94
Total	**355**	**100.00**

n = 355

3.2 Early flash flood warning

Among the households (30%) who had experienced of flash flood during last five years, majority (87%) of the households and their neighbor did not receive early warning about the last flash flood. It is evident from the Table 3.7 that only 13% households receive early warning about the last flash flood.

Table 3.7: Early warning about the last flash flood

Category	No. of HHs	Per cent
Received early warning	46	13.00
Did not receive early warning	309	87.00
Total	355	100.00

n = 355

Among the households (30%) who had the experience of flash flood during last five years, as shown in Table 3.8, 35% reported that they received the early warning before 1.5 days before the onset of last flood, 26% received early warning on the day of flash flood occurred, 17% received 2-2.5 days before the onset of flash flood, 17% received 3 - 4.5 days before the onset of last flash flood. Only 4% received 5 days before the onset of flash flood.

Table 3.8: Gap between occurrence of last flash flood and receiving early warning about the flash flood

Category	No. of HHs	Per cent
The day the flash occurred	12	26.09
1.5 days before the onset of flash flood	16	34.78
2 – 2.5 days before the onset of flash flood	8	17.39
3 – 3.5 days before the onset of flash flood	4	8.70
4 – 4.5 days before the onset of flash flood	4	8.70
5 days before the onset of flash flood	2	4.35
Total	**46**	**100.01**

n=46

Among the households (30%) who had the experience of flash flood during last five years, as shown in Table 3.9, only one third (30%) households reported that the flash flood occurred on the day of forecast, 26% reported flood occurred 2 days in advance of the forecast, 17% reported flood occurred 1 day in advance of the forecast, 10% reported flash flood did not occur as per warning, 7% reported flood occurred 2 days later of the forecast and 4% reported flood occurred 2 days later of the forecast.

Table 3.9: Accuracy of early warning about the onset of last flash flood

Accuracy of warning	No. of HHs	Per cent
Flash flood did not occur	5	10.87
Flood occurred 1 day in advance of the forecast	8	17.39
Flood occurred 2 days in advance of the forecast	12	26.09
Flood occurred on the day of the forecast	14	30.43
Flood occurred 1 day later of the forecast	2	4.35
Flood occurred 2 days later of the forecast	3	6.52
Flood occurred more than 2 days later of the forecast	2	4.35
Total	**46**	**100.00**

n = 46

Among the households (30%) who had the experience of flash flood during last five years, as shown in Table 3.10, television was the major (61%) source of early warning for the last flash flood followed by the neighbors from the same village or the adjacent village (28%), radio 7%, friends'/relatives from other upazila'/district 2% and market place 2%.

Table 3.10: Sources of early warning for the last flash flood

Source of warning	No. of HHs	Per cent
Neighbours from the same village or adjacent village	13	28.26
Friends'/relatives from other upazila/district	1	2.17
Market place	1	2.17
Television	28	60.88
Radio	3	6.52
Total	**46**	**100.00**

n = 46

As shown in Table 3.11, most (83%) of the respondents reported television as the convenient/acceptable source of advance information about flash flood, the second most (9%) source of information was verbal information and the third most (6%) was cell phone. Only 2% reported radio as the source of information.

Table 3.11: Most convenient/acceptable source of advance information about flash flood

Most convenient/acceptable source of advance information	No. of HHs	Per cent
Cell phone	70	5.83
Television	992	82.67
Radio	22	1.83
Verbal information	111	9.25
Others	5	0.42
Total	**1200**	**100.00**

n = 1200

4. Deposition of Silt and Cultivation on Deposit

In haor areas, most of the bed of water bodies (haors, canals and beels) have risen substantially due to the deposition of silt/clay and become completely dry during the dry season (April-May). During the dry season, most of the water bodies also become unfit for water transportation. But most of the households are benefited by cultivating and preparing seed beds on the deposit.

As shown in Table 4.1, most of the respondents (79%) reported that the canals of their neighborhood were completely dried-up during the dry season (April-May) due to the deposition of silt/clay carried out by the current (flow of water), the second most (14%) reported that there was little water in the canals but not suitable for boat transportation and the third most (7%) reported that the canals were open for water transportation and water transports were able to ply.

Table 4.1: Canals Chocked Due to the Deposition of Silt/Clay

Level of chocking of canals	No. of HHs	Per cent
Canals become chocked with silt/clay so that they dry up completely during the dry season (April-May)	945	78.75
There is little water but not suitable for boat transportation	171	14.25
Open for water transportation and water transports were able to ply	84	7.00
Total	**1200**	**100.00**

n = 1200

As a consequence of filling up with silt/clay, 70.50 per cent HHs reported that the canals/streams dry up during the dry season (Table 4.2 below). Some 14.08 per cent HHs reported that the depth of canals/streams decreased over time. Only 14.42 per cent HHs reported that the adjacent canals are (still) immensely deep and never dry up.

Table 4.2: Drying up of neighboring (village, union, upazila) haor/beels (marshland)

Level of drying up of haor/beels	No. of HHs	Per cent
Haor/beels completely dry up during the dry season	846	70.50
Haor/beels immensely deep and never dry up	173	14.42
Compared to 15 years back, the depth decreased considerably	181	15.08
Total	**1200**	**100.00**

n = 1200

In haor areas, it is a common practice for cultivating and preparing seed beds on the deposit of hoar/beel. It is evident from Table 4.3 that majority of the respondents (82%) cultivate/prepare seed beds on the deposit (silt/clay) of neighboring haor/beels. Only 18% households did not cultivate and prepare beds on the deposit.

Table 4.3: Extent of cultivation/preparation of seed beds on the deposit (silt/clay) of neighboring haor/beels areas

Category	No. of HHs	Per cent
Do cultivate/prepare seed beds on the deposit (silt/clay) of haor/beels	983	81.92
Do not cultivate/prepare seed beds on the deposit (silt/clay) of haor/beels	217	18.08
Total	**1200**	**100.00**

n = 1200

Traffic Volume Counting Survey

1. Background

Road infrastructure provides accessibility and mobility, leading in turn to increased transport operations, economic activity, subsequent economic growth and ultimately a healthy and sound economy. An adequate road infrastructure network also provides an advantage to a country in terms of improved regional integration, which helps to promote regional and national trade and significantly enhances the economic growth and development of a country and consequently alleviates poverty. Keeping this in mind LGED is going to implement about 600 KM Upazila, Union and Village roads through Haor Infrastructure and livelihood Improvement Project (HILIP) in the Haor basin of 26 Upazilas under five districts. In the light of those events it was felt necessity both by the implementing agency and IFAD to carry out a baseline study prior to the investment in rural infrastructure in order to establish baseline conditions of the different components specially in transport infrastructure to provide benchmark information on existing traffic volume plying along the road before development to compare the changes over time.

2. Introduction

The purpose of this report is to perform traffic analysis of the proposed road to be developed by the project. Hence traffic volume studies are conducted to determine the number, movements, and classifications of roadway vehicles at a given location. These data can help determine the influence of vehicles or pedestrians on vehicular traffic flow, or document traffic volume trends. The Baseline Survey is the first step in the project. This baseline survey will gather key information early in a project so that later judgments can be made about the changes and development results will be achieved by the project. As a part of the process traffic count survey is undertaken by the project may provide some precise information about numbers of vehicles, their type and their frequency of travel along the sample road.

3. Objectives of the Traffic Count Survey

The first survey would be conducted in the beginning of the project implementation to assess the overall status of the traffic movement along the proposed sample roads to be developed under the project. Results from this survey would be used as references by the project stakeholders to assess the outcomes and impact of project interventions after an interval of project implementation. It is also intended that the baseline will assist HILIP project to carry out subsequent surveys, analyze the data and monitor the changes over the baseline situation.

4. Scope of the Survey

It is proposed that the baseline study on the proposed roads will not be done in each road. First reason is that some roads will have the same conditions and characteristics and therefore it is logical and practical to just get a sample from each group. Based on initial analysis of the conditions and characteristics of the roads to be implemented and schedule of implementation, baseline survey is proposed to be conducted in 28 roads including 13 Upazila roads and 15 Union roads. Table 1 presents the selected Upazila road sample. for the baseline survey.

Table 1: Selected Upazila and Union road samples

Upazila Road Sample				
Cluster #	District	Upazila	Name of Road	Proposed Length(km)
1	Sunamgonj	Jamalgonj	Salimganj-Alipur-Gaglajor GC Road	8
2	Kishoregonj	Itna	Itna-Azmiriganj GC Road	5
3	Sunamgonj	Sullah	Sullathana HQ-kadirgonj GC Road	8
4	Hobigonj	Ajmirigonj	Ajmirigonj Paharpur Road	2
5	Hobigonj	Baniachong	Hobigonj nobigonj R&H Road (Imambari)-Baniachong GC Via Gunuee Barauri	5
6	Hobigonj	Lakhai	Lokra-Modina Bazar Road	3
7	Hobigonj	Baniachong	Baniachong GC-Paharpur GC Road via Adarsha Bazar Ariamugar Road	5
8	Kishoregonj	Itna	Itna-Jawar hat via Raituty Hizaljani Road	12
9	Kishoregonj	Nikli	Nikli Bazar-Singpur Bazar Road	2
10	Netrakona	Khaliajhuri	Khaliajhuri GC -Lipsa Bazar Road	5
11	Netrakona	Mohangonj	Chesrakhali GC-Zia-Kora GC Road	1
12	Hobigonj	Ajmirigonj	Paharpur Baniachong via Jhilua Road	2
13	Brahmanbaria	Bancharampur	Morichakandi GC-Doshani R&H Road Via Kanainagar, Chamonichakandi, Santipur, Ichaour & Shibpur Road	8

Union Road Sample					
14	Sunamgonj	Sunamgonj Sadar	Mohanpur	Mongalkata-Bongaon-Hasaura Road	5
15	Sunamgonj	South Sunamgonj	Patharia	Joykalosh-Mirzapur-Jamalgonj-Noa.	4
16	Netrakona	Kalmakanda	Pogla	Pogla UP Office (Alambari)-Gouya Bazar Road via Monkandia	3
17	Hobigonj	Ajmirigonj	Shippasha	Shippasha UP Office-Paschimvag Bazar Via Mokiasjan	2
18	Hobigonj	Baniachong	Muradpur	Bithangal GC- Monduria UP Office Road via Bijoypur	5
19	Hobigonj	Lakhai	Bulla	Muriakari UP Office - Lakhai UP Offece Via Krishnapur Bazar	5
20	Hobigonj	Baniachong	Kagapasha	Kagapasha UP Office-Chamakpur Bazar	5
21	Kishoregonj	Itna	Baribari	Chowganga UP - Chandrapur Hat Road	3
22	Kishoregonj	Mithamain	Gopedighi	Gopedighi UP Office-Baghadia Bazar via Gopedighia Bazar, Telihati, Saradiahati, Shyampur and Dhanai	3
23	Netrakona	Kalmakanda	Barekhpon	Barekhpon UP Office-Jatrabari Bazar Road	6
24	Netrakona	Kalmakanda	Kalmakanda	Baro Khapon UP Office -Gutura Bazar Rd	5
25	Netrakona	Mohangonj	Suair	Suair UP Office-Barantar Bazar Road	5
26	Brahmanbaria	Bancharampur	Pahariakandi	Salimabad UP(Ashrafbad) - Rarupashdi Bazar Rd via Huglakanda	5
27	Brahmanbaria	Nabinagar	Kaitala	Karibari Bazar (R & H) - Rasullabad UP Road via Kathalia Bazar	4
28	Brahmanbaria	Nasirnagar	Bolacot	Dharmondal UP Office - Marakut Bazar Rd(Fundauk Bazar)	6

5. Analytical Techniques and Methodology

Considering the socio-economic variety covering wide geographic spread as well as length, 13 Upazila and 15 Union roads of Haor Infrastructure and livelihood Improvement Project (HILIP) were selected from five districts. In the project planning phase, these selected roads proposed for development was brought under baseline study. As a result 5 districts were brought under the baseline study for road component. These data will be used as a benchmark to the impact analysis and as such will be the foundation of 'before' situation. Random sampling has been utilized for selecting the sample roads. For each road, the traffic count (tally count) was carried out for twelve hours from 7 am to 7 pm on two days (1 Hat day and 1 non-Hat day) of the same week. Tally counts is to be done in bundles of five; four vertical marks being crossed with the fifth for every fifth vehicle passing the station during each hour of the count. The survey team visited physically the roads from start to end, in pointing out the link points. The fieldwork for traffic counting was carried out from May 26, 2013 to June 23 by deploying three teams. Each team consists of four enumerators and one of the senior members of the team was designated as Supervisor/Team Leader. While counting traffic of a road, the enumerators of each team were divided into two sub-teams. Each sub-team consists of two enumerators. One of the sub-team was assigned for traffic counting of site “A” (starting point of a road) and site “B” (ending point of a road). The counting of a road took two days by team.

5.1 Location and Duration of Traffic Counts

Traffic counts have been carried out for each road section.

- Two spots (starting and ending point of the sample road), according to characteristics of the road;
- During a hat day (market day) and a non-hat day (non market day);
- From 7:00 am to 7:00 pm. 12 hours count from morning to evening.

5.2 Types of Vehicles

The following types of vehicles need to be counted:
Motorized Vehicles:

- Auto Rickshaw (including Baby Taxi, Mishuk, easy bike and Tempo).
- Jeep/Car/Taxi
- Motor Cycle
- Pickup Van/Microbus/Ambulance
- Bus/Minibus
- Truck/Tractor/Tanker/power tiller.
- Nosimon/Korimon

Non-Motorized Vehicles:

- Bicycle
- Rickshaw
- Rickshaw Van
- Bullock Cart (Including Push Cart)

Besides, the pedestrian traffic volume need to be counted based on the following categories:

- Pedestrian with load
- Pedestrian without load

6. Identification and Selection of Indicators/Parameters

The indicators were selected well ahead of conducting the benchmark survey. The selected indicator/parameter used in this study is specifically stated as follows:

Upazila and Union Road Related Indicators

- Traffic frequency, type of vehicles & movements of traffic including pedestrians;

7. Fieldwork

The data collection on the pre-developed Upazila & Union Roads was accomplished by counting of transports, pedestrians using tally sheet.

7.1 Training of Enumerators

All of the field personnel (QCO, Supervisors and enumerators) were imparted training for two days including one day in-house training on the issues related to the traffic volume counting or data collection and another day for field practicing. In addition, they were guided, monitored and supervised at the field level during data collection so that they do not face any confusion in filling up the tally sheet.

7.2 Supervision and Monitoring of Data Collection

One quality control officer was deployed in the field for overseeing the fieldwork and maintaining quality. In addition to that senior professionals from Mitra and Associates was also visited the fieldwork.

This comprehensive survey activity were also closely and constantly monitored & supervised by the consultant. In addition, the LGED field level officials were also involved in supervision and follow up. The filled up questionnaire were checked and verified by consultant time to time to ensure collection of reliable data and information.

7.3 Data Processing and Analysis

Following the field data reviewed and checked by the consultant, data were processed in the customized software programme for making a database for the baseline study. The data sheets available from the software programme were re-checked to ensure rationality and the data were also validated where necessary. A number of tables were designed by consultant and the computer outputs are presented through graphs and tables for analysis.

8. Major Survey Findings

This chapter attempts at interpreting the pre-development status of Upazila & Union roads which were selected and surveyed under the baseline survey conducted during the beginning of season. It should be mentioned here that the data collected on each item from the survey were averaged, and the average results were presented in the relevant tables and graphs. It also gives a description of the best estimate (2013) of traffic flow on the sample road proposed for development and an indication of the motorized and non-motorized vehicles including commercial transports.

8.1 Baseline Situation: Traffic Volume/Traffic flow

Almost all the union & village roads under this baseline study were found in earthen physical condition. Taking into consideration of the movements of the different types of vehicles on the selected roads, the average volumes of movements of those different types of vehicles per road on both hat and non-hat day at pre-project (benchmark) scenarios are depicted in Table-1. The estimated (2013) traffic flows contained in the table refer to 12-hour 2-way flows on an average day.

9. Union Roads

Traffic counters provide information on the volume of traffic by hour of day and vehicle class, i.e., motorcycle, car, goods vehicles distinguished by number of axles etc. with up to fifteen vehicle classes being identified. Vehicles are detected by two ways traffic count passing over loops embedded in the road surface. Through visual observation using tally sheet the traffic counter tried to estimate the volume of traffic on the sample road passing the measurement point during a period of 12 hours. It is possible from the data collected to establish the vehicle profiles and the various vehicle classes involved in base case situation.

Table 2 provides an estimate of visual counts from 30 traffic-counting points of 15 union roads carried out by two days.

Table 2: Average traffic frequencies by type of transports on the Hat day and non-Hat day for Union roads

Name of Transports	Hat Day Traffic Frequency	Non-hat day Traffic Frequency
	Total No.	Total No.
Motorized		
CNG/Tempo/Nasiman/bodbody	34	19
Motor cycle	27	19
Jeep/car/taxi	0	0
Pickup/Microbus/Ambulence	1	1
Bus/Minibus	1	.0
Truck/Tractor with Trolley	6	3
All Motor Transports	**69**	**42**
Non-Motorized		
Rickshaw	24	14
Rickshaw Van	17	6
Bicycle	41	36
Cart	15	7
All Non-Motor Transports	**97**	**63**
All Transports	**166**	**105**

The Table 2, highlights a scenario of the movements of the different types of vehicles/transports at pre-development situation of sample roads proposed for development by the project. The average number of motorized vehicle movements is by **69** on hat day and **42** on non-hat day following the improvement of the road. Similarly, the average number of non-motorized vehicle movements is by 97 on hat day and **63** on non-hat day.

Table 3: Comparison of motorized and non-motorized transports

Motorized			Non- Motorized		
Hat Day	Non-Hat Day	Average	Hat Day	Non-Hat Day	Average
69	42	55.5	97	63	80

Motor Vehicles

As shown in Table 3, the motorized vehicle fleet in the project roads is 69 on hat day and 42 on non-hat day. Similarly non-motorized is 97 on hat day and 63 on non-hat day. So the percentage of motorized vehicles is 42% out of total vehicles on hat day where as non-motorized is 58% which is more.

It is also clear from the table that motor cycle /CNG/Tempo/Nasiman/bodbody becomes a dominant mode of transport which is almost new innovation in the traffic fleet of Bangladesh. It could be inferred that CNG/Tempo/Auto-rickshaw/battery driven taxi is meeting a significant transport demand in the project areas for the trips.

Table 4: Share of Dominant Modes of Transportation in Total Traffic Fleet on hat day in Baseline situation *(Percentage of total Traffic)*

Type of Transports				
M/Cycle	**CNG/Auto-rickshaw**	**Rickshaw**	**Van**	**Bicycle**
16	20	14	10	25

As shown in Table 4, the share of Bi-cycle in total traffic is 25% followed by 20, 16,14 and 10 percent by CNG, Motor Cycle, Rickshaw and van respectively.

Pedestrian movements

The Table 5 indicates a picture of the sample project road on the movement of pedestrian with and without load on hat and non-hat day.

Table 5: Average Movements of Pedestrians on Hat & Non-hat day/road/km

Type Pedestrian	***Movements in Hat Day/road (Total No.)***	***Movements in Non-hat day/road (Total No.)***
Pedestrian with load	145	76
Pedestrian without load	1334	1067
Total	1479	1143

For monitoring purposes the people walking along the roads have been categorized into two groups. These two groups are pedestrians walking without and with a load. On average, the number of without loaded pedestrians is 1334 in hat day and 1067 in non-hat day. There is a tendency for those roads with higher percentage loaded pedestrians, to be poorly served by public transport vehicles and buyers/sellers of goods have no alternative but to head load or shoulder-pole their goods. But if and when the roads are improved, a significant proportion of load carriers will shift from foot to vehicles given some justification to the project's immediate objective.

10. Upazila Road

Traffic volume and categories of vehicle use the road is the indication of how busy and important is the road for passenger and commodity movements. The data collected through the classified traffic counts have been processed and analyzed**. In Table 6,** the vehicles have been classified as representative vehicles under motorized and non-motorized categories.

Table 6: Average traffic frequencies per road on hat day and non-Hat day.

Type of Transports	Hat Day Traffic Frequency	Non-hat day Traffic Frequency
	Total No.	Total No.
Motorized		
CNG/Tempo/Nasiman/bodbody	17	11
Motor cycle	33	19
Jeep/car/taxi	0	0
Pickup/Microbus/Ambulence	0	.0
Bus/Minibus	0	0
Truck/Tractor with Trolley	3	2
All Motor Transports	**53**	**32**
Non-Motorized		
Rickshaw	25	15
Rickshaw Van	11	5
Bicycle	43	28
Cart	26	11
All Non-Motor Transports	**105**	**59**
All Transports	**158**	**91**

Both motorized and non-motorized along with some heavy motorized vehicles were found plying over the sample roads. The average volumes of various types of vehicles are presented in Table1. The table shows that 158 vehicles were counted of which 53 motorized and 105 non-motorized, on 26 (13 roads x 2 points per road) survey points on the project roads. The motorized and non-motorized traffic represented 34% and 66% of the total traffic.

The special feature of counts was presence of large number of buffalo cart and horse cart in some roads for carrying goods to and from farm gate to market. In some roads motor cycle was found to carry passengers on hire. Overwhelming rickshaw and rickshaw van is common in all sampled roads.

All sorts of motor vehicles was found at different mixes – Tractor, Trolley, Motorcycle, other 3/4 wheel light vehicles and other non-motorized vehicles.

Table 7: Comparison of Motorized and Non-Motorized Transports

Motorized			Non- Motorized		
Hat Day	Non-Hat Day	Average	Hat Day	Non-Hat Day	Average
53	32	42.5	105	59	82

As shown in Table 7 that the average number of motorized vehicle movements both on hat and non hat day is 42.5. Average movement of non-motorized vehicle on the other hand, both on hat and non-hat day is 82. So the dominance of non-motorized vehicles is evident in the sample roads.

Table 8: Share of dominant modes of transportation in total traffic fleet

on hat day (Percentage of total Traffic)

Type of Transports				
Motor Cycle	**CNG/Auto-rickshaw**	**Rickshaw**	**Van**	**Bicycle**
21	11	16	10	27

As shown in Table 8, motor and bicycle are more common in Haor region. Among the non-motorized traffic bicycle dominated the fleet followed by rickshaw and van. Among motorized traffic, motor cycle has been dominating with more than 21 of the total traffic on hat day. According to the characteristics of traffic on unimproved roads, the number of non-motorized traffic (NMT) was overwhelmed. The survey found a large number of human drawn push cart in some unimproved roads suitable for carrying small loads.

Pedestrian Movements

Pedestrians are important in upazila roads where both male and female passengers use them. Pedestrian traffic count was carried out in all sample selected roads. The average movement of pedestrians is presented in Table 8.

Table 9: Movements of pedestrians on Hat & Non-hat day/road/km

Type Pedestrian	**Movements in Hat Day/road (Total No.)**	**Movements in Non-hat day/road (Total No.)**
Pedestrian with load	144	118
Pedestrian without load	1415	960
Total	**1559**	**1078**

The table reveals a benchmark level of pedestrian activity before development of the roads and show the hierarchy of streets for pedestrian movement within an area**.** The Table 8, it is evident that the roads are widely used by the pedestrians both on hat and non-hat days. Pedestrian movement displayed a typical pattern where without load is more dominant than with laod. The proportion without load varied greatly between the observed days. Now the majority of road users are the pedestrians without load.

11. Conclusion

The traffic counts result of sample roads, reveals that most of the project roads are potential for traffic generation and growth after improvement. Basic characteristics of rural traffic mix will prevail with little higher percentage of non-motorized traffic. The local indigenous mode such as rickshaw and rickshaw van will dominate with introduction of intermediate type improvised intermediate vehicles such as Easy Bike, Votvoti, Nasimon, Karimon and auto-rickshaws. Roads of all Haor regions showed similar pattern of traffic between hat and non-hat days. The traffic in hat days becomes more than non-hat day. Therefore, hats and growth centers are important for rural traffic generation and growth. All roads surveyed are away from the cities and towns serving local needs of transport demand. Few roads previously paved now damaged showed that motorized vehicles are continuing plying proving comparatively cheaper services even after deterioration of road surface. In these sample roads both mechanized and non-mechanized vehicles have taken place serving the passengers and goods movements to their origins and destinations. Thus improvement of these road is a wonderful idea to serve people in the areas in all seasons with improved road surface which is a crying need of the local people.