

# **Chars Livelihoods Programme**

**Socio-economic characteristics and  
nutritional status of Cohort 2.2 (first tier);  
report of the baseline survey conducted  
in October/November 2010**

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# 1 Executive Summary

During October and November 2010 a baseline socio-economic and nutrition survey was conducted on a random sample of 410 newly recruited CLP 2.2 households from Kurigram, Gaibandha, Rangpur, Lalmonirhat and Nilphamari. The main findings are as follows:

- Information was collected about 1531 individuals, of whom 803 were adults (15 years of age and above), 447 were children aged between 5-15 years, and 281 were under 5 year old children;
- 16.8% of households were female headed and average household size was 3.73, with male headed households having, on average, over two more family members than female headed households;
- Overall nearly 80% of household heads had not been to school; 50.3% of school aged children went to school and there was no gender difference in school attendance;
- 2.3% of household members reported having some disability, slightly more so in adult males than females;
- Mean number of infections reported by households in the 30 days prior to the survey was 0.74 infections per household with 50.7% of households reported having one or more infections. Fever was the most common condition (48.8%) followed by diarrhoea (7.1%), dysentery (5.8%) Respiratory Tract Infection (4.4%), skin infection (2.2%) and 1.1% reported passing worms;
- Over 85% of male heads were employed as day labourers (27.5%, female heads). 80.7% of all adult males had worked for cash in the 30 days prior to the survey (14.9% adult females) and overall 2.7% were unemployed;
- Average land occupied by a homestead was 3.8 decimals. Most homesteads were constructed of corrugated iron/tin roof, walls of either jute, stick straw or tin sheet and all households had a dirt floor. On average households had lived at their homestead for 6.5 years. 31.0% had their floor submerged during the 2007 floods;
- 67.5% of households had a raised plinth of which 23.7% were provided by CLP.
- 23.2% of households had access to a sanitary latrine but open defecation was practised by about 1 in 5 adults and over half of the children;
- 32.9% of households had soap or ash close to the latrine, only 3.2% of females reported using soap or ash before food preparation increasing to 29.8% after cleaning the child's anus;
- Only 13.9% of tubewell were observed to have a protective cement platform and 20.0% of households with access to a tube well had a platform on a raised plinth;
- Nearly all households were within a 10 minutes round trip of a water source;

- 27.6% of households had cash savings averaging 256 Taka (mean 71 Taka for all households) and 17.6% of households had taken out a loan (average 790 Taka) in the last 30 days;
- Mean value of total assets was 1771 Taka of which productive assets were worth, on average, 655 Taka;
- Mean per capita income was 16.1 Taka pppd based on criteria used during CLP-1;
- Mean per capita expenditure was 16.0 pppd based on criteria used during CLP-1. Food costs accounted for 1300 Taka, 77.1% of total household expenditure and more so in male headed households (77.6%);
- Food diversity was generally poor with very little consumption of animal protein (except fish) in the 7 days prior to the survey. The mean number of food groups consumed was 6.2 (maximum 13);
- 71% of households ate smaller food portions and 42% ate fewer meals during the 7 days prior to the survey. The mean number of food coping strategies used due to a shortage of food or income was 2.2;
- Nutritional status of the mother was poor; 45.3% had Chronic Energy Deficiency as defined by a Body Mass Index (BMI) < 18.5 (mean 19.1 kgm<sup>-2</sup>) and 55.1% were anaemic (mean haemoglobin level 117.9 g/dl). Overall 74.2% of mothers had a BMI <18.5 or were anaemic;
- Nutritional status of < 5 year old children was poor; 42.9% were stunted (mean height-for-age -1.69), 41.3% were underweight (mean weight-for-age -1.81) and 19.3% were wasted (mean weight-for-height -1.21). 54.8% of children were either stunted, underweight or wasted. 47.5% were anaemic (mean haemoglobin 108.7 g/dl).
- An increase in mother's BMI was associated with an increase in the child's height-for-age, weight-for-age and the ratio of weight to height. An increase in mother's haemoglobin by 1 g/dl was associated with a rise in child's haemoglobin of 0.247 g/dl;
- There were no significant associations between expenditure on food, income, food security and mother or child nutritional status.

## CLP2.2 Households by Key Indicators

Area of Focus	Indicator	CLP2.2
Income/Expenditure/Savings	Mean per capita income (Taka)	16.1
	Mean per capita expenditure (Taka)	16.0
	% of households with cash savings	27.6%
	Mean value of cash savings (Taka) for households with savings (all households)	256 (71)
Nutrition Mother  Child	- mean BMI	19.1
	- % with BMI < 18.5	45.3%
	- mean haemoglobin level	117.9
	- % anaemic	55.1%
	- mean height-for-age z-score	-1.69
	- % stunted	42.9%
	- mean weight-for-age z-score	-1.81
	- % underweight	41.3%
	- mean weight-for-height z-score	-1.21
	- % wasted	19.3%
- mean haemoglobin level	108.7	
- % anaemic	47.5%	
Food Security	Mean household expenditure on food during the 30 days before the survey	1300
	Mean number of food groups consumed during the 7 days before the survey	6.2
	Mean number of food coping strategies used during the 7 days before the survey	2.2
Livelihood assets	Mean value of productive assets	655
	Mean value of total assets	1771
	% of households on raised plinth	61.0%
	% of households with access to a sanitary latrine	23.2%
	% of households with access to a tubewell with a platform on a raised plinth	20.0%
Risk Preparedness	% of households who had their floor submerged during the 2007 flood	61.2%
Infections, Health and Hygiene	Mean number of infections reported by household during the 30 days before the survey	0.74
	% of households reported as having 1+ infections	50.7%
	% of households reported having Diarrhoea in the 30 days before the survey	7.1%
	% of households reported having Dysentery in the 30 days before the survey	5.8%
	% of households reported having Fever in the 30 days before the survey	49.0%
	% of households reported having RTI in the 30 days before the survey	4.4%
	% of households reported having Skin Infection in the 30 days before the survey	2.2%
	% of households reported having Passed Worms in the 30 days before the survey	1.1%
	% of households reported that adult males practice open defecation	22.3%
	% of households reported that adult females practice open defecation	19.5%
	% of households reported that children practice open defecation	51.8%
	% of households where soap or ash is closed to the latrine	32.9%
	% of households where the female reports using soap or ash before preparing food	3.4%
% of households where the female reports using soap or ash after cleaning a child's anus	29.8%	

## 2 Background and aims of the baseline surveys

The aim of this report is to document the socio-economic and nutritional status of a sample of cohort 2.2 (first tier) households. The 'empowerment' status of core participants is presented in a separate report. CLP is focussing on improvements covering 11 areas listed below. Progress against these indicators is monitored at varying intervals up to the end of the CLP-2:-

1. **Income/Expenditure/Savings** – mean per capita income and expenditure and per capita consumption expenditure
2. **Nutritional status of mother and under 5 year old children** – improvement in mother's Body Mass Index and haemoglobin level and in children improvement particularly in height-for-age and weight-for-height as well as haemoglobin level
3. **Food security and quantity and quality of diet** - mean household expenditure on food during the 30 days prior to the survey, mean number of meals in the previous 7 days, mean number of food groups consumed during the previous 7 days and mean number of food coping strategies used during the previous 7 days
4. **Risk preparedness** – percentage of households that had their floor submerged during the 2007 flood and the percentage of households expressing confidence to remain on the chars during the floods
5. **Health status** – mean number of infections reported by households in the previous 30 days and percentage of households reporting having fever, dysentery, diarrhoea, Respiratory Tract Infection (RTI), skin infection, and passing worms in the previous 30 days
6. **Hygiene and sanitation** – percentage of households (a) reporting that adult males and females and children practice open defecation and (b) soap or ash close to the latrine, and females report using soap or ash before food preparation and after cleaning child's anus
7. **Seasonal household food security** – percentage of households in which men migrate due to seasonal hunger
8. **Productive and livelihood assets** – mean value (Taka) of productive and total assets, social capital, percentage of households (a) on a raised plinth (b) access to a sanitary latrine and (c) with access to a tubewell, with a platform on a raised plinth
9. **Household contacts, networks and relationships** – mean number of household contacts
10. **Linkages to public and private basic services** – percentage of households (a) accessing services by type of service and (b) knowledge of services by type of service
11. **Self confidence among women and girls** – percentage of women and girls reporting enhanced self confidence, percentage of households (a) expect to pay dowry (b) receive dowry (c) legal age of marriage is males and females is known (d) females report violence (physical, verbal and sexual) and percentage of women (a) that an identify and feel confident to access 2+ sources of support and redress and (b) aware of laws related to dowry and early marriage

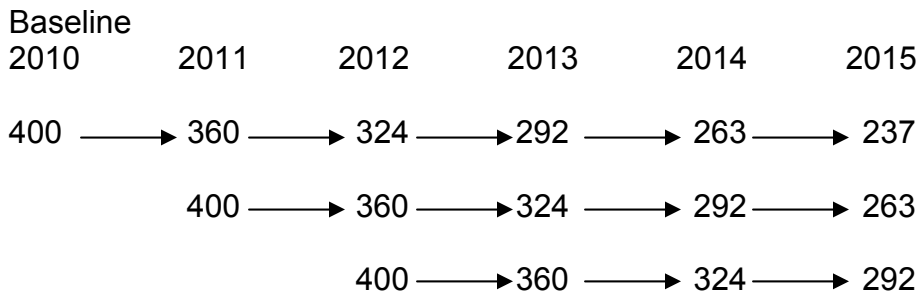
This report is able to provide information on indicators 1-8 above.

### 3 Study design and survey methodology

A longitudinal (panel) study design is being used in which about 400 households will be randomly recruited from each cohort between 2010 and 2013 and all households will be followed until 2016. The new cohort which will not have received any asset transfer, will act as a control group.

Figure 1 shows the study design based on 10% attrition. The longitudinal design will examine (a) within subject (mother and child) changes (b) between cohort comparisons of old and new cohorts and (c) recruitment homogeneity.

**Figure 1 Study Design**



## 4 Results

### 4.1 Household socio-demographic characteristics

A total of 410 households took part in the survey with 54.4% from Kurigram followed by Gaibandha (24.6%), Rangpur (9.0%), Lalmonirhat (7.6%) and Nilphamari (4.4%). Information was collected on 1531 individuals, 803 adults (defined as 15+ years of age), 447 children aged between 5 and 15 years of age and 281 under 5 year old children. The overall sex ratio was 0.98:1.00 (male:female) and there was no significant difference in sex ratio in adults or children.

Female headed households made up 16.8% (Table 1) of the sample compared with 10.2% nationally (Household Income and Expenditure Survey, HIES, 2005). There was no significant geographical variation in the distribution of male and female headed households. Female heads were primarily widowed (69.6%) or divorced/abandoned (27.5%) and none were married (2.9% separated), while all male heads were married. Although there is a highly significant difference in marital status between male and female headed households, here and elsewhere in this report total household information has been included to allow comparisons with other datasets which have not been disaggregated. The mean reported age of adult household heads was 40.0 years but female heads were significantly older by, on average, 12.5 years than male heads ( $p < 0.001^1$ ).

The overall mean family size was 3.71 (range 1-9) which is lower than the national figure of 4.85 (HIES, 2005). Female headed households had, on average, 2.2 fewer family members than male headed households (1.93 versus 4.09,  $p < 0.001$ ). Female headed households had fewer adults, children 5 to 15 years of age and under 5 year old children. Over 85% of female headed households had no other adult member compared with 0% in male headed households (Table 1).

<sup>1</sup> Here and elsewhere in this report the p (probability) value is quoted. A p value  $< 0.05$  signifies significant differences between the items being compared. So the reported mean ages of male and female headed households are not the same, and females are, on average, older. As the difference in mean age increases so the p value becomes smaller and the result becomes more significant. A p value of 0.025 indicates that a result occurs 1/40 times by chance alone,  $p = 0.001$ , 1/1000 by chance alone. When the result is very significant i.e. p values are very small, the convention is to replace the exact p value (in this example  $p = 0.00000000000517$ ) by  $p < 0.001$ .

**Table 1 Geographical location and socio-demographic characteristics of male and female headed households**

Variable	Head of Household		p	Total (n=410)
	Male n=341 (83.2%)	Female n=69 (16.8%)		
Geographical Location			ns	
Gaibandha	26.1	17.4		24.6
Kurigram	54.0	56.5		54.4
Lalmonirhat	7.0	10.1		7.6
Nilphamari	4.7	2.9		4.4
Rangpur	8.2	13.0		9.0
Total	100.0	100.0		100.1
Marital Status (%)			<0.001	
Married	100.0	0.0		83.2
Separated	-	2.9		.5
Divorced	-	11.6		2.0
Abandoned	-	15.9		2.7
Widowed	-	69.6		11.7
Total	100.0	100.0		100.0
Mean Age	37.9	50.4	<0.001	40.0
Mean Family Size	4.09	1.93	<0.001	3.73
Number of adults (%)			<0.001	
1	0	85.5		14.4
2	89.7	10.1		76.3
3+	10.3	4.4		9.3
Total	100.0	100.0		100.0
Number of children 5 to 15 years (%)			0.001	
0	39.9	59.4		43.2
1	24.6	29.0		25.4
2	19.1	5.8		16.8
3+	16.4	5.8		14.6
Total	100.0	100.0		100.0
Number of children < 5 years			<0.001	
0	37.0	89.9		45.9
1	46.6	10.1		40.5
2	16.4	0		13.7
Total	100.0	100.0		100.0



## 4.2 Education

Overall about 80% of household heads had not been to school, significantly more so in female headed households (Table 2) where nine out of ten female heads had received no schooling compared with just over three-quarters of male heads. When all adults were considered as a group educational levels were very similar in male and female adults (Table 2) with just over 70% not attending school. However when household heads were excluded very marked gender differences were apparent and nearly two thirds of non-head male adults had received some schooling compared with just over a third of non-head female adults.

**Table 2 Education by Gender**

Variable	Gender		p	Total
	Male	Female		
Education – head			0.048	
None	77.1	89.9		79.3
1-5 years	16.1	8.7		14.9
6+ years	6.7	1.4		5.9
Total	100.0	100.0		100.0
Education all adults (%)			ns	
None	73.5	69.7		71.5
1-5 years	18.2	21.2		19.8
6+ years	8.3	9.1		8.7
Total	100.0	100.0		100.0
Education – adults non head (%)			0.002	
None	36.4	65.8		63.4
1-5 years	39.4	23.6		24.9
6+ years	24.2	10.6		11.7
Total	100.0	100.0		100.0
Education - children 5 to 15 years (%)			ns	
None	51.7	47.4		49.7
1-5 years	44.8	50.2		47.4
6+ years	3.5	2.3		2.9
Total	100.0	100.0		100.0

Of the children 5 to 15 years of age 90.2% were from male headed households (403 children, 202 boys and 201 girls) while children from female headed households accounted for the remaining 9.8 % (30 boys and 14 girls). Overall just over half of school aged children went to school (Table 3) and there was no significant difference in school attendance between male and female headed households.

**Table 3 Percentage of children 5 to 15 years of age attending school by Head of Household**

Head of Household	Boy		Girl		p by boy and girl	All children	
	No	Yes	No	Yes		No	Yes
Male	51.0	49.0	48.3	51.7	ns	49.6	50.4
Female	56.7	43.3	35.7	64.3	ns	50.0	50.0
p by head of household	ns		ns			ns	
Total	51.7	48.3	48.4	51.6	ns	49.7	50.3

### 4.3 Disability and Infection

Of all household members 2.3% were reported as having some disability, but more so in adults than children primarily due to greater physical and psychological disability, deaf, dumb and chronic illness (defined as persistent illness for the last three months or longer). There was no sex significant difference in reported disability by head of household, or for all adults or children (Table 4). When all household members were combined together no significant sex difference in reported disability was observed.

The households were also asked about their health condition (infections) over the last 30 days (Table 5). Adults reported having more dysentery, fever and respiratory tract infections than children in the month before the survey. About 1 in 3 adults were suffering from one or more infections in the last month compared with 1 in 5 children < 5 years of age and about 1 in 10 children 5 to 15 years of age.

The mean number of infections reported by households in the 30 days prior to the survey was 0.74 infections/household and 50.7% of households reported having one or more infections. Fever was the most common infection (49.0%) followed by diarrhoea (7.1%), dysentery (5.8%), Respiratory Tract Infection (RTI) (4.4%), skin infection (2.2%) and 1.1% reported passing worms (Table 5).

**Table 4 Reported disability by Gender**

Disability (%)	Head of Household			All adults			Children 5 -15 years			Children < 5 years			All household members		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Without illness	96.2	91.3	95.4	96.0	96.7	96.4	99.1	99.1	99.1	99.3	99.2	99.3	97.6	97.8	97.7
Blind	0.6	0	0.5	0.5	0	0.2	0	0	0	0	0.8	0.4	0.3	0.1	0.2
Physical disability	0.6	1.4	0.7	0.8	0.7	0.7	0.4	0.5	0.4	0.7	0	0.4	0.7	0.5	0.6
Psychological disorder	0.6	1.4	0.7	0.8	0.2	0.5	0.4	0.5	0.4	0	0	0	0.5	0.3	0.4
Deaf	0.3	4.3	1.0	0.3	1.2	0.7	0	0	0	0	0	0	0.1	0.6	0.4
Dumb	0.3	0	0.2	0.3	0.2	0.2	0	0	0	0	0	0	0.1	0.1	0.1
Chronic illness	1.5	1.4	1.5	1.3	0.9	1.1	0	0	0	0	0	0	0.7	0.5	0.6
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
p	ns			ns			ns			ns			ns		

**Table 5 Health condition in the last 30 days per household**

Infection (%)	All adults	All children 5 to 15 years	All children < 5 years	Households where at least 1 member was infected
Diarrhoea	2.9	1.5	2.7	7.1
Dysentery	4.1	0.2	1.5	5.8
Fever	24.4	9.3	15.1	48.8
Respiratory Tract Infection	2.4	0	2.0	4.4
Skin infection	0.5	0.7	1.0	2.2
Passed worms	0.2	0.2	0.7	1.1
Mean number of infections/household				0.74
Number of infections				
0	67.8	89.3	79.8	49.3
1	29.8	9.5	18.3	43.2
2+	2.4	1.2	1.9	7.5

#### 4.4 Employment

Overall 2.7% of adults were unemployed and over 42.1% of all working adults were employed as a day labourer and 42.8% were engaged in housework. There were highly significant differences in occupations between male and female workers, both for heads of households and for all adults.

Over 80% of male heads reported their main occupation as a day labourer compared with 27.5% of female heads (Table 6). Female heads main occupations were as a domestic maid or housework. 8.7% of female heads were beggars compared with only 0.6% of male heads.

Information was also collected on the main paid occupation in the 30 days prior to the survey (Table 7). 87.7% of male household heads had a paid occupation compared with only 58.0% of female heads. Overall 80.7% of all adult males had worked for cash in the last month compared with only 14.9% of adult females ( $p < 0.001$ ).

In the 30 days prior to the survey male household heads worked significantly more days, on average, than female heads (12.0 versus 7.2 days, respectively,  $p < 0.001$ ) based on the total sample of male and female heads. When the analyses were restricted to working-only heads there was no significant sex difference in the number of days worked (13.7 versus 12.5 days, male and female, respectively).

The majority of children aged between 5 and 15 years of age were reported to be either students (64.3%) or unemployed (27.1%) and 11 were engaged in cash income work during the 30 days prior to the survey.

**Table 6 Main reported occupation of Adults**

Main occupation (%)	Head of Household		All adults		
	Male N=341	Female N=71	Male N=383	Female N=449	Total N=803
Agriculture day labourer	78.3	14.5	75.1	4.4	037.4
Non-agriculture day labourer	7.6	13.0	7.8	3.3	5.4
Weaver	0.6	1.4	0.5	0.2	0.4
Maid	0	40.6	0.3	8.4	4.6
Rickshaw puller	5.9	0	5.3	0	2.5
Fisherman	2.3	0	2.1	0	1.0
Housework	0.3	20.2	0.5	79.7	42.8
Service	0.3	0	0.5	0.2	0.4
Small trader	1.8	1.4	1.6	0.5	1.0
Beggar	0.6	8.7	0.5	1.4	1.0
Student	0	0	1.6	0.2	0.9
Unemployed	2.3	0	4.0	1.6	2.7
p	<0.001		<0.001		

**Table 7 Main paid occupation of Adults in the month prior to the survey**

Main cash occupation (%)	Head of Household		All adults		
	Male N=299	Female N=40	Male N=309	Female N=67	Total N=376
Agriculture day labourer	77.6	17.5	77.0	29.9	68.6
Non-agriculture day labourer	13.0	17.5	13.9	14.9	14.1
Weaver	0.7	0	0.6	0	0.5
Maid	0	65.0	0	55.2	9.8
Rickshaw puller	5.0	0	4.9	0	4.0
Fisherman	2.7	0	2.6	0	2.1
Housework	0	0	0	0	0
Service	0	0	0	0	0
Small trader	0	0	0	0	0
Beggar	0	0	0	0	0
Student	0	0	0	0	0
Other	1.0	0	1.0	0	0.8
p	<0.001		<0.001		

#### 4.5 Household land ownership and access

The average land occupied by a homestead was 3.78 decimals<sup>1</sup> (range 1-18 decimals) and male headed households had significantly more homestead land, on average, than female headed households (3.98 versus 2.80 decimals,  $p<0.001$ ).

Very few households occupied any cultivable land (Table 8). 16 households reported having share in land (mean 22 decimals, median 15 decimals) with one household having 99 decimals.

**Table 8 Type of cultivable land and mean amount (decimals)**

Source	N	Mean (decimals)
Own	-	-
Mortgage out	-	-
Mortgage in	-	-
Share out	-	-
Share in	16	22
Lease out	-	-
Lease in	-	-
Khas	-	-

#### 4.6 House ownership and structure

<sup>1</sup> One decimal is equal to 40 m<sup>2</sup>

On average households had lived at their homestead for 6.5 years (range 1 month to 40 years), female headed households more so, on average, than male headed households (9.1 years versus 5.9 years,  $p < 0.001$ ).

Of the ten households who were living with another household significantly more were female headed (7.2%) than male headed (1.5%,  $p < 0.01$ ). Most homesteads were constructed of a corrugated iron/tin roof, either jute stick, straw, tin sheet or to a lesser extent bamboo for the walls and all households had a dirt floor (Table 9). There were no significant differences in homestead construction by head of household after excluding those living with another household.

**Table 9 Material used for construction of roof, wall and floor**

Material (%)	Roof	Wall	Floor
Corrugated iron/tin sheet	85.4	21.0	-
Bamboo	-	5.1	-
Straw	7.1	17.3	-
Jute Stick	5.1	54.1	-
Dirt	-	-	97.6
Living with another household	2.4	2.4	2.4
Total	100.0	100.0	100.0

Overall 61.0% of households had a raised plinth of which 23.7% were provided by CLP. No significant differences were found between male and female headed households in having a raised plinth.

In the last flood 4.9% of the households ( $n=20$ ) did not exist. Based on all households ( $n=410$ ) 29.5% reported that the floor of their current homestead was submerged under water and based on households that existed at the time ( $n=390$ ) 31.0% were submerged; 13.1% of these households had to temporarily move to another area. In the 2007 flood well over half of households flooded (61.2%) and of these over half (35.4%) had to move to another area. On average, households had moved 2.8 times, either temporarily or permanently, due to high floods or erosion. There were no significant differences in flooding experience between male or female headed households except that female headed households reported having to move more often (4.3 times) than male headed households (2.6 times).

## **4.7 Water, sanitation and hygiene and defecation practices**

### **4.7.1 Water and sanitation**

All households reported obtaining their drinking water from a tube well. However only 13.9% of tube wells were observed to have a protective cement platform and 61.0% of tube wells were on a raised plinth; 20.0% of households had a platform on a raised plinth. Overall just over a third of households owned or

shared ownership of a tube well, but there was a very marked difference between male and female headed households with nearly 40% of male headed households owning or sharing ownership of a tube well compared with only just over 14% of female headed households (Table 10). Very few households had a CLP provided tube well.

**Table 10 Water source and sanitary latrine**

Variable	Head of household		p	All households
	Male	Female		
Water source (%)			<0.001	
Own	29.6	10.1		26.3
Shared ownership	9.4	4.3		8.5
Owned by other	61.0	85.5		65.1
CLP provided (%)			ns	
No	99.4	100.0		99.5
Yes	0.6	0		0.5
Mean time to water source (minutes)	1.6	2.1	0.025	1.7
% within 10 minutes round trip of water source	99.7%	100%	ns	99.8%
Used water purification (%)	0	0	-	0
Access to safe drinking water	13.6%	5.8%	ns	12.2%
% access to a sanitary latrine	23.8%	20.3%	ns	23.2%

Female headed households had to walk, on average, about half a minute more than male headed households, in order to obtain their drinking water. Nearly all households were within a 10 minute round trip of a water source. Overall about 1 in 8 households had access to safe drinking water defined as (a) from a tubewell (b) protected by a platform (c) on a raised platform (d) within a 10 minute round trip of a water source. Only 23% of households had access to a sanitary latrine (a latrine with cement slab platform, 5 cement rings, and unbroken seal covered by tin or corrugated iron sheeting or bamboo superstructure) and there was no significant difference in access between male and female headed households.

#### **4.7.2 Hygiene practice of female beneficiaries**

Hygienic practices of female beneficiaries before food preparation, eating and serving food and feeding children were generally poor and only 3.2% reported using soap or ash before food preparation (Table 11). Just under a third of females (29.8%) reported using soap or ash after cleaning the child's anus.

**Table 11 Female hand washing practices**

Washing hands (%)	Head of household		p	All households	Households with access to a sanitary latrine	Households with own tube well
	Male	Female				
Before food preparation			ns			
Soap	3.8	-		3.2	4.2	3.7
Ash	0.3	-		0.2	-	-
Water only	34.3	27.5		33.2	31.6	38.0
Did not answer	61.6	72.5		63.4	64.2	58.3
Total	100.0	100.0		100.0	100.0	100.0
Before eating			ns			
Soap	7.6	8.7		7.8	8.4	6.5
Ash	-	-		-	-	-
Water only	76.2	66.7		74.6	73.7	75.9
Did not answer	16.1	24.6		17.6	17.9	17.6
Total	100.0	100.0		100.0	100.0	100.0
Before serving food			ns			
Soap	2.9	-		2.4	4.2	3.7
Ash	-	-		-	-	-
Water only	14.7	15.9		14.9	10.5	20.4
Did not answer	82.4	84.1		82.7	85.3	75.9
Total	100.0	100.0		100.0	100.0	100.0
After defecation			ns			
Soap	11.1	8.7		10.7	18.9	6.5
Ash	66.9	65.2		66.6	58.9	70.4
Water only	4.4	4.3		4.4	1.1	5.6
Did not answer	17.6	21.7		18.3	21.1	17.6
Total	100.0	100.0		100.0	100.0	100.0
Before feeding child			0.024			
Soap	0.9	14.3		1.3	-	-
Ash	0.9	-		0.9	-	-
Water only	20.8	14.3		20.6	20.8	20.6
Did not answer	77.4	71.4		77.2	79.2	79.4
Total	100.0	100.0		100.0	100.0	100.0
After washing child's anus			ns			
Soap	4.5	14.3		4.8	6.3	1.6
Ash	25.8	-		25.0	22.9	25.4
Water only	3.2	-		3.1	2.1	3.2
Did not answer	66.5	85.7		67.1	68.8	69.8
Total	100.0	100.0		100.0	100.0	100.0

Less females from male headed households reported washing their hands with soap before feeding the child than females from female headed households (0.9% versus 14.3%, respectively p=0.035).

The enumerators observed whether or not soap or ash was available at the tube well or latrine. Of the households with access to a latrine only 37.6% of these households had soap or ash at the latrine and of the households with a tube well under a third had soap or ash at the tube well (Table 12); 51% had either soap/ash at the latrine or tubewell. So there was a marked discrepancy between the percentage who report hand washing with soap or ash after defecation and the observed availability of soap or ash.



**Table 12 Availability of soap and ash at the tube well and at the latrine**

Availability	Head of household		p	All households
	Male	Female		
Tube well (%)			ns	
Soap	6.8	-		6.3
Ash	25.6	40.0		26.6
No	67.7	60.0		67.1
Total	100.0	100.0		100.0
Latrine (%)			ns	
Soap	5.0	-		4.7
Ash	33.8	20.0		32.9
No	61.3	80.0		62.4
Total	100.0	100.0		100.0

**4.7.3 Defecation practices**

Overall a fifth of all adults (males 22.3%, females 19.5%) practiced open defecation increasing to 51.8% in children (Table 13). 23.1% of adults used a sanitary latrine while 27.8% used an unhygienic latrine and a further 28.3% used a pit latrine (a simple hole in the ground, with or without a cement platform or superstructure). For children over 40% defecated at the homestead.

There were no associations between washing and defecation practices, availability of soap or ash and infection.

**Table 13 Defecation practices**

Defecation	Location	Adult male	Adult female	Total (%)
All adults	Own sanitary latrine	3.0	2.7	2.8
	Other sanitary latrine	20.4	20.2	20.3
	Pit latrine	27.2	29.3	28.3
	Latrine unhygienic	27.2	28.3	27.8
	River/pond	-	-	-
	Open defecation	22.3	19.5	20.8
	Total	100.0	100.0	100.0
Children	Own sanitary latrine			0.9
	Other sanitary latrine			1.3
	Pit latrine			2.2
	Homestead			40.8
	Latrine unhygienic			1.3
	River/pond			-
	Open defecation			51.8
Total			100.0	

#### 4.8 Household assets

Twenty seven different household assets were identified of which 11 were defined as productive assets (see Annex 1 for details) . The overall mean worth of productive assets was 655 Taka and non-productive assets of 1,116 Taka. Male headed households had 50% more productive assets and nearly twice as much non-productive assets as female headed households. Total worth of all assets was 1,771 Taka with much higher worth of assets, on average, in male headed households.

**Table 14 Total value of productive and all assets**

Value of assets	Head of household Mean Taka		p	All households Mean Taka
	Male	Female		
Productive	698	438	0.007	655
Non-productive	1,210	651	<0.001	1,116
Total	1,909	1,089	<0.001	1,771

#### 4.9 Savings and loans

Overall 27.6% of households reported having some savings and there was no significant difference between male headed (29.0%) and female headed (20.2%) households. The average amount saved was 256 Taka (Table 15) for those households with savings, and the mean fell to 71 Taka when all 410 households were considered. Among those with savings there was no significant difference in mean savings between male and female headed households. Savings in the last month averaged 181 Taka and no significant difference was found between male and female headed households (188 versus 137 Taka, respectively). The mean savings for all households in the last 30 days was only 49 Taka.

One sixth of households had a loan, significantly more so in male than female headed households (20% versus 6%, respectively,  $p < 0.02$ ). The amount of the loans taken was not significantly different by head of household. Only 1.5% of male headed households had given loans to others.

In the 30 days prior to the survey nearly 18% of households had taken out a loan and the mean amount of 790 Taka did not differ between male and female heads of household. Overall 7% of households had made a cash repayment on a loan, averaging 458 Taka. About 1.0% of male headed households had loaned money to others. Only 2 male headed households had received a loan cash repayment in the last 30 days.

**Table 15 Savings and loans (Taka)**

Savings and Loans	Head of household				p	Mean amount (Taka) for households only with loans or savings	Mean amount (Taka) all households
	Male		Female				
	n	Mean amount (Taka)	N	Mean amount (Taka)			
Savings	99	262	14	210	ns	256	71
Informal interest free loan	111	584	9	284	ns	562	164
Informal with interest loan	29	1812	1	200	ns	1758	129
Interest loan CBO etc.	1	3250	-	-	-	3250	8
Loan given to others	5	640	-	-	-	640	8
Loans during the last 30 days							
Loan taken	68	814	4	390	ns	790	139
Cash loan repayment	23	495	4	245	ns	458	30
Loan given to others	5	640	-	-	-	640	8
Cash loan repayment received	2	250	-	-	-	250	1
Savings in last 30 days	97	188	13	127	ns	181	48

#### 4.10 Household income

CLP-1 based household income on (a) the cash and in-kind income from regular sources of household members (b) cash and in-kind income from irregular sources (e.g. selling of poultry) and (c) household income related to loans taken and cash loan repayments received. As there were some costs associated with the cash work, the net cash income (gross – costs) is presented. Full details of how household income was calculated are provided in Annex 1. Based on this approach, the overall mean income of the households was 1,641 Taka/month (Table 16) but male headed households had a much higher mean monthly income than female headed households (1,801 versus 849 Taka, respectively). The much higher income in male headed households was mainly accounted for by the greater earnings of adults and also loans taken. Female headed households had significantly higher in-kind income from adults as well as in-kind income from irregular sources than male headed households.

Overall per capita income was 16.1 Taka but there was no significant difference between male and female headed households due to the smaller family size of female headed households. Based on this approach of calculating income, 67.3% of households fell below the Rajshahi poverty line of 18 Taka pppd.

**Table 16 Mean monthly income in Taka**

Item	Head of Household		p	All households
	Male	Female		
Adults				
Net Cash	1,347	315	<0.001	1,174
In-kind	45	103	0.010	55
Children				
Net Cash	12	18	ns	13
In-kind	0	9	ns	2
Irregular				
Cash	211	233	ns	215
In-kind	22	148	<0.001	44
Loan taken	162	23	0.019	139
Loan payment received	1	0	ns	1
Total	1801	849	<0.001	1,641
Per capita income/day	16.0	16.2	ns	16.1

**Table 17 Percentage of households in the lowest income decile**

Criteria	Male	Female	p	All households
CLP-1				
2005	35.8	39.1	ns	36.3
2008 CPI	54.5	60.9	ns	55.6
2008 FPI	57.5	62.3	ns	58.3

HIES (2005) provide average monthly income by decile. For the lowest decile the average monthly income was 1,523.41 Taka in rural areas. As the average household size was 5.28, the average Taka/head/month is  $1,523.41/5.28 = 288.52$  Taka/month or 9.62 Taka pppd. This is the average figure for the decile and does not provide a threshold for the upper limit of the lowest decile (with all the households in the decile having lower income levels). This upper limit can be estimated by taking the mid-point between the lowest decile and the decile above. This is a sensible approach as the increase from one decile to the next is fairly similar for all the lower deciles. This calculation gives an upper threshold of 12.53 Taka. Between 2005 and 2008 the Consumer Price Index (CPI) increased by 27% and the Food Price Index (FPI) by 32% thus increasing the thresholds to 15.9 and 16.54 Taka pppd respectively.

Based on CLP-1 criteria (Table 17) 36.3% of households fell below the 2005 threshold, increasing to 55.6% and 58.3% with correction for inflation.

#### 4.11 Household expenditure

Household expenditure during CLP-1 (see Annex 1 for details) was calculated over the previous 30 days. Based on the CLP-1 approach of calculating expenditure, overall household expenditure of cohort 2.2 households was 1,686 Taka which was significantly higher, on average, in male headed households (Table 18). Cost of food was the largest expenditure item in both male (77.6% of total expenditure) and female (71.6% of total expenditure) headed households and overall households spent 77.1% of total expenditure on food (mean food expenditure = 1,300 Taka). Total expenditure per capita was 16.0 Taka, significantly higher in male headed households (16.7 Taka) than female headed households (12.3 Taka).

**Table 18 Household expenditure**

Item	Head of household		p	All households
	Male	Female		
Food	1466	483	<0.001	1300
Non-food (household, agriculture and social)	382	177	<0.001	348
Loan repayment	33	14	ns	30
Loans to others	9	0	ns	8
Total expenditure	1890	675	<0.001	1686
Total expenditure/capita/day	16.7	12.3	0.008	16.0

**Table 19 Percentage of households in the lowest expenditure decile**

Criteria	Male	Female	P	All households
CLP-1				
2005	65.7	78.3	<0.05	67.8
2008 CPI	82.1	85.5	ns	82.7
2008 FPI	84.8	88.4	ns	85.4

Using the same methodology as described in section 4.10 the expenditure threshold was 17.80 Taka pppd rising to 22.61 and 23.50 Taka pppd based on CPI and FPI, respectively. Based on CLP-1 criteria nearly two thirds of male headed households fell below the 2005 expenditure threshold increasing to nearly 80% in female headed households. Using CPI and FPI over 80% of households fell below the expenditure threshold.

#### 4.12 Difference between household income and expenditure

The difference in household income and expenditure (income minus expenditure) was calculated based on CLP-1 criteria (Table 20). Households, on average, were in debit by 45.4 Taka, but female headed households were in credit (+174.1 Taka) while male headed households were, on average, in debit by 89.8 Taka.

**Table 20 Net (mean) credit-debit**

Income – expenditure	Head of household		p	All households
	Male	Female		
CLP-1 criteria	-89.8	+174.1	<0.001	-45.4

#### 4.13 Household food security

Table 21 presents a breakdown of the foods consumed by household members in the 7 days prior to the survey. Food diversity was generally poor with very little milk, meat and poultry in the diet. Female headed households had a worse diet than male headed households with respect to intake of pulses, potato, fruit and oils, but slightly better intake of dark vegetables. The average number of different foods eaten was 6.2 but there was significantly greater diversity in male than female headed households (6.3 versus 5.6 foods eaten, respectively,  $p < 0.001$ ).

Thirteen different strategies were identified to cope with food shortages (Table 22). Overall about 71% of households reported eating smaller meals and 42% reported eating fewer meals during the last 7 days (Table 22). Half of female headed households ate lower quality meals compared with about one third of male headed households. Female headed household were also more likely to eat wild food. No households reported going without food for any 24 hour period and about 6% of households sent a family member to eat elsewhere. Male headed households were more likely to give more food to earning members. About 1 in 5 households had taken a food loan and female headed households were more likely to beg for food. Overall the mean number of food shortage coping strategies used was 2.2 and there was no significant difference between male and female headed households.

**Table 21 Food types consumed by the household in the last 7 days**

Item	Head of household		p	All households
	Male	Female		
Rice 7 days	100.0	100.0	-	100.0
Wheat			ns	
0	80.1	91.3		82.0
1	4.7	4.3		4.6
2	6.2	2.9		5.6
3+	9.1	1.4		7.8
Pulses			0.017	
0	52.5	71.0		55.6
1	24.3	13.0		22.4
2+	23.2	15.9		22.0
Milk			ns	
0	94.7	97.1		95.1
1+	5.3	2.9		4.9
Meat			ns	
0	98.8	100.0		99.0
1+	1.2	0		1.0
Poultry			ns	
0	97.7	95.7		97.3
1+	2.3	4.3		2.7
Eggs			ns	
0	88.3	88.4		88.3
1	7.9	8.7		8.0
2+	3.8	2.9		3.7
Fish			0.007	
0	11.1	18.8		12.4
1	20.2	24.6		21.0
2	23.5	33.3		25.1
3+	45.2	23.2		41.5
Potato			0.001	
0	15.0	23.2		16.3
1	8.2	14.5		9.3
2	21.7	31.9		23.4
3	22.3	20.3		22.0
4+	32.8	10.1		29.0
Dark vegetables			0.003	
0	44.0	46.4		44.4
1	13.8	1.4		11.7
2	19.4	15.9		18.8
3	12.9	13.0		12.9
4+	10.0	23.2		12.2
Other vegetables			ns	
0	10.6	10.1		10.5
1	7.3	4.3		6.8
2	17.0	13.0		16.3
3	17.0	20.3		17.6
4+	48.1	52.2		48.8
Sugar			ns	
0	87.7	95.7		89.0
1+	12.3	4.3		11.0
Fruit			0.024	
0	90.3	98.6		91.7
1+	9.7	1.4		8.3
Oil			0.003	
0	.9	1.4		1.0
1-4	2.1	1.4		2.0
5+	97.1	97.1		97.1
Other			ns	
0	98.5	100		98.8
1-5	.3			.2
6+	1.2			1.0
Mean food diversity	6.3	5.6	<0.001	6.2

**Table 22 Food coping strategies used over the previous 7 days**

Strategy	Head of household		p	All households
	Male	Female		
Number of days eat smaller meals			<0.001	
0	29.6	26.1		29.0
1	7.0	8.7		7.3
2	27.3	17.4		25.6
3	22.0	11.6		20.2
4+	14.1	36.2		17.8
Total	100.0	100.0		100.0
Number of days eat fewer meals			ns	
0	59.5	50.7		58.0
1	6.8	2.9		6.1
2	12.3	20.3		13.7
3	13.2	10.1		12.7
4+	8.2	15.9		9.5
Total	100.0	100.0		100.0
Number of days eat lower quality meals			ns	
0	89.4	85.5		88.8
1	5.6	5.8		5.6
2	2.9	1.4		2.7
3+	2.1	7.2		2.9
Total	100.0	100.0		100.0
Number of days eat uncultivated (wild) food			0.015	
0	97.4	91.3		96.3
1	2.6	8.7		3.7
Total	100.0	100.0		100.0
Number of days eat no food in any 24 hours			-	
0	100.0	100.0		100.0
1+	-	-		-
Total	100.0	100.0		100.0
Number of days send family member to eat elsewhere			ns	
0	94.4	94.2		94.4
1+	5.6	5.8		5.6
Total	100.0	100.0		100.0
Number of days give more food to earning household member			<0.001	
0	69.8	97.1		74.4
1	2.3	0		2.0
2	8.8	0		7.3
3	9.4	0		7.8
4+	9.7	2.9		8.5
Total	100.0	100.0		100.0
Number of days sell asset to provide food			ns	
0	99.1	100.0		99.3
1+	0.9	-		0.7
Total	100.0	100.0		100
Number of food loans taken			ns	
0	84.5	91.3		85.6
1	10.9	8.7		10.5
2+	4.7	-		3.9
Total	100.0	100.0		100.0
Number of days food loaned out			ns	
0	99.4	100.0		99.5
1+	0.6	-		0.5
Total	100.0	100.0		100.0
Number of days food loan taken			ns	
0	78.9	88.4		80.5
1	9.7	5.8		9.0
2+	11.4	5.8		10.5
Total	100.0	100.0		100.0
Number of days bought food on credit			0.017	
0	77.4	94.2		80.2
1	7.6	1.4		6.6
2	5.0	1.4		4.4
3+	10.0	2.9		8.8
Total	100.0	100.0		100.0
Number of days begged for food			<0.001	
0	95.3	79.7		92.7
1+	4.7	20.3		7.3
Total	100.0	100.0		100.0
Mean food shortage strategies	2.3	2.0	ns	2.2



#### 4.13.1 Homestead gardens

Of the 55 (13.4%) households who reported growing some produce on their homestead garden during the last 30 days, 49 were male headed. The number of different fruits, vegetables and spices ranged from 1 to 7 and the Taka value of the harvest ranged between 20 and 360 Taka (mean=124 Taka). Only four households sold any produce during the last 30 days (mean=131 Taka), 11 households loaned harvest to others (mean value=26.4 Taka) and no households reported any costs associated with their homestead garden.

#### 4.14 Nutritional Status of Mothers

##### 4.14.1 Anthropometry

The Body Mass Index (BMI, weight (kg)/height (m)<sup>2</sup>) was calculated for all mothers and the overall mean was 19.1. There was no significant difference in mean BMI between mothers in male or female headed households (Table 23) and the overall mean BMI was 19.1.

BMI was categorised into three levels of Chronic Energy Deficiency (CED) <16.0 (CED III), 16 - 16.9 (CED II) and 17 – 18.49 (CED I) and normal (18.5+). Overall 45.3% of mothers were suffering from CED (compared with 30% in the Bangladesh Demographic Survey, 2007) and there was no significant difference in the percentages between male and female headed households.

**Table 23 BMI of mothers**

BMI	Head of household		p	All mothers
	Male	Female		
Mean BMI	19.1	18.9	ns	19.1
BMI categories (%)			ns	
<16	7.6	10.3		8.1
16-16.9	12.1	16.2		12.7
17-18.49	23.8	27.9		24.5
18.5+	56.5	45.6		54.7

##### 4.14.2 Haemoglobin level

Haemoglobin (Hb) level was obtained from a finger prick of blood. The mean haemoglobin level was 117.9 g/l well below the anaemic threshold of 120 g/l. There was no significant difference in mean haemoglobin levels between mothers living in female or male headed households (Table 24).

**Table 24 Haemoglobin level of mothers**

Haemoglobin	Head of household		p	All mothers
	Male	Female		
Mean haemoglobin	118.3	115.7	ns	117.9
Haemoglobin categories (%)			ns	
Anaemic	54.4	58.8		55.1
Normal	45.6	41.2		44.9
Total	100.0	100.0		100.0

No mothers were suffering from severe anaemia (<70 (g/l), but 55.1% were anaemic (defined as between 70 – 119.9 g/l) and there was no significant difference in the percentages between male and female headed households.

#### 4.14.3 Anthropometry and haemoglobin level

The relationship between haemoglobin and BMI categories is presented in Table 25. Three- quarters of mothers were suffering from undernutrition as defined by CED or anaemia and 1 in 5 mothers had both CED and anaemia

**Table 25 Relationship between haemoglobin and BMI categories**

Hb category	BMI category	Head of household		p	All mothers
		Male (%)	Female (%)		
Normal	Normal	26.5	22.1	ns	25.8
Normal	CED	19.2	19.1		19.2
Anaemic	Normal	30.1	23.5		29.0
Anaemic	CED	24.2	35.3		26.0

### 4.15 Nutritional status of Under 5 Year Old Children

#### 4.15.1 Anthropometry

From the measured height and weight of each child, the z-scores of height-for-age (HAZ), weight-for-age (WAZ) and weight-for-height (WHZ) were computed using the WHO (2006) standards. For example,

$$\text{z-score for height} = \frac{\text{observed height} - \text{median standard height}}{\text{standard deviation of height}}$$

Low height-for-age (or length-for-age for children below 2 years of age) is a measure of past (chronic) undernutrition. Infants and children with z-scores <-2.00 are said to be stunted and those <-3.00 severely stunted (Table 26). Low weight-for-age reflects both past (chronic) and present (acute) undernutrition but is unable to distinguish between them. Infants and children with z-scores <-2.00 are said to be underweight and <-3.00 severely underweight. Low weight-for-

height is a measure of current or acute undernutrition and infants and children with z-scores <-2.00 are said to be wasted and <-3.00 severely wasted.

**Table 26 Cut-offs for z-scores of height-for-age, weight-for-age and weight-for-height**

Nutritional indicator	Very severe	Severe	Normal
Height-for-age (stunting)	<-3.00	-2.00 to -2.99	≥-1.99
Weight-for-age (underweight)	<-3.00	-2.00 to -2.99	≥-1.99
Weight-for-height (wasting)	<-3.00	-2.00 to -2.99	≥-1.99

A total of 261 children below 5 years of age were analysed of which 142 were boys (sex ratio (1.19:1). The mean HAZ and WAZ were both close to -1.8, while the mean WHZ was -1.26 There was no significant difference in means between boys and girls although boys, on average, had lower z scores for all three nutritional indicators. Overall 42.9% of children were stunted (Table 28), 41.9% underweight and 19.3% wasted and more boys were severely stunted (17.7%) than girls (11.0%)

**Table 27 Mean z-scores of boys and girls**

Nutrition indicator	Boys	Girls	p	Total
HAZ	-1.77	-1.60	ns	-1.69
WAZ	-1.86	-1.75	ns	-1.81
WHZ	-1.26	-1.15	ns	-1.21

**Table 28 Percentage of boys and girls stunted, underweight and wasted**

Nutrition indicator	% Very severe			% Severe			% Normal			p
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	
HAZ	17.7	11.0	14.7	30.5	25.4	28.2	51.8	63.6	57.1	ns
WAZ	14.0	14.0	14.0	29.4	24.8	27.3	56.6	61.2	58.7	ns
WHZ	4.3	3.4	3.9	14.9	16.1	15.4	80.9	80.5	80.7	ns

45.2% of children had a normal HAZ, WAZ and WHZ (Table 29) and 1 in 9 children were stunted, underweight and wasted. 90% of wasted children (acute undernutrition) also showed evidence of chronic undernutrition. There were no significant differences in the percentages by sex of the child.

**Table 29 Percentage of children stunted, underweight and wasted**

Nutritional status	Boys	Girls	P	All children
Normal	40.4	50.8	Ns	45.2
Stunted only	12.8	7.6		10.4
Underweight only	2.8	4.2		3.5
Wasted only	4.3	3.4		2.9
Stunted and underweight	24.8	17.8		21.6
Stunted and wasted	-	-		-
Underweight and wasted	4.3	5.1		4.6
Stunted, underweight and wasted	10.6	11.0		10.8
Total	100.0	100.0		100.0

**4.15.2 Haemoglobin level**

Haemoglobin level was also determined in < 5 year old children. The threshold for severe anaemia is 70 g/l and anaemia is defined by a haemoglobin level between 70-109.9 g/l. The overall mean haemoglobin level was below the non-anaemic cut-off of 110 g/l. No child was severely anaemic (Table 30) and overall 47.5% of children were anaemic.

**Table 30 Haemoglobin levels in boys and girls**

Mean haemoglobin				Very severe			Severe			Normal			p
Boys	Girls	p	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	
108.4	108.9	ns	108.7	-	-	-	47.2	47.9	47.5	52.8	52.1	52.5	ns

**4.15.3 Anthropometry and haemoglobin level**

The inter-relationship between anaemic status and stunting, wasting and underweight are presented separately in Table 31. For both HAZ and haemoglobin and WAZ and haemoglobin about one third of children had normal nutritional status while for WHZ and haemoglobin nearly 45% had normal nutritional status.

**Table 31 Percentage of anaemic, stunted, underweight and wasted children**

Z-score	Z-score category	Hb category	Boys	Girls	p	All children
HAZ	Normal	Normal	25.0	36.2	ns	30.1
	Stunted	Normal	27.9	15.5		22.3
	Normal	Anaemic	27.1	26.7		26.7
	Stunted	Anaemic	20.0	21.6		20.7
WAZ	Normal	Normal	29.6	36.1	ns	32.6
	Underweight	Normal	23.2	16.0		19.9
	Normal	Anaemic	27.5	26.1		26.8
	Underweight	Anaemic	19.5	21.8		20.7
WHZ	Normal	Normal	46.4	42.2	ns	44.5
	Wasted	Normal	6.4	9.5		7.8
	Normal	Anaemic	34.3	39.7		36.7
	Wasted	Anaemic	12.9	8.6		10.9

There were no significant differences between boys and girls in the inter-relationships between anaemia, stunting, underweight and wasting and so Table 32 presents the combined data on boys and girls. Just over 45% of the < 5 year old children had a normal nutritional status as defined by z-scores and haemoglobin levels and 14.8% of children were anaemic, stunted, underweight and wasted. Of the children with normal anthropometry 47.0% were anaemic.

**Table 32 Anaemia and extent of stunting, underweight and wasting combined**

Anthropometry	Anaemic (%)	Non-anaemic (%)	All children
Normal	45.1	46.3	45.7
Stunted only	9.0	11.9	10.5
Underweight only	3.3	3.7	3.5
Wasted only	3.3	4.5	3.9
Stunted and underweight	19.7	23.1	21.5
Stunted and wasted	-	-	-
Underweight and wasted	4.9	3.0	3.9
Stunted, underweight and wasted	14.8	7.5	10.9
Total	100.0	100.0	100.0

#### 4.16 Association between Mother and child's nutritional status

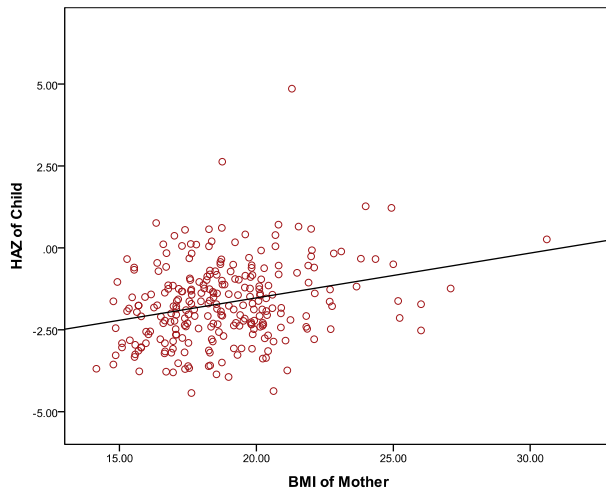
Significant positive relationships were found between mother's BMI and child z-scores and between mother and child haemoglobin levels (Figures 2 to 5).

For each 1 unit increase in mother's BMI the child's HAZ improved by, on average, 0.137 standard deviations (Table 33), WAZ by 0.133 and WHZ by 0.075. For each unit increase in maternal haemoglobin the child increased by 0.247 g/l.

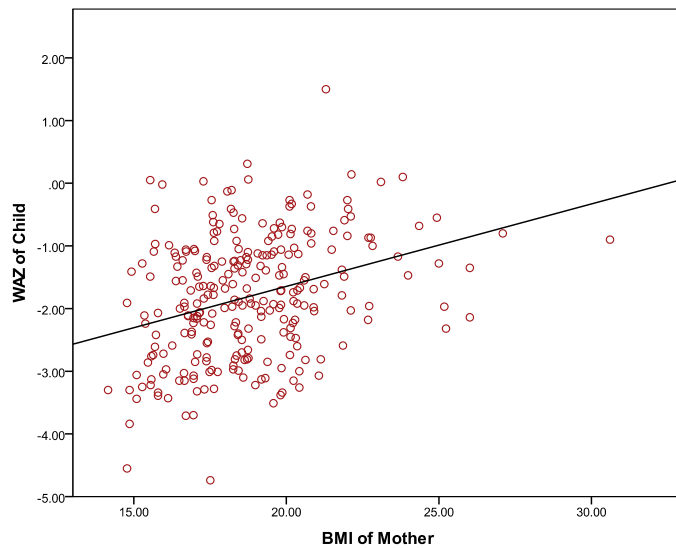
**Table 33 Relationship between mother and child nutritional status**

Mother	Child	Regression coefficient (slope)	P
BMI	HAZ	+0.137	<0.001
BMI	WAZ	+0.133	<0.001
BMI	WHZ	+0.075	0.012
Haemoglobin	Haemoglobin	+0.247	0.001

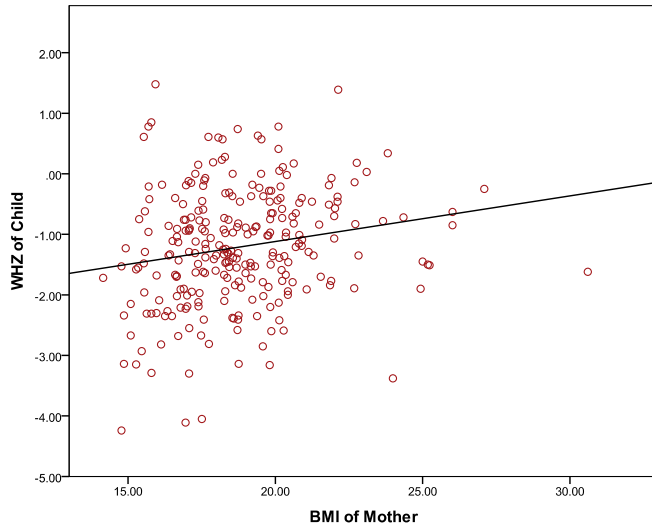
**Figure 2 Scatterplot of Child HAZ by Maternal BMI**



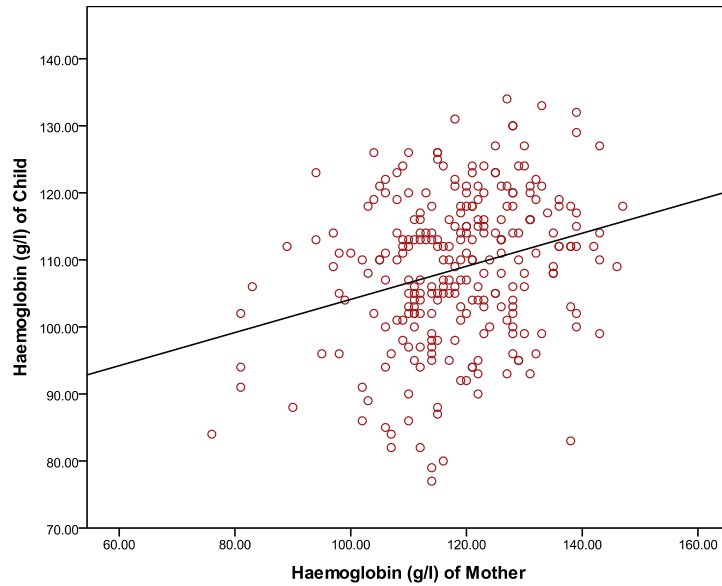
**Figure 3 Scatterplot of Child WAZ by Maternal BMI**



**Figure 4 Scatterplot of Child WHZ by Maternal BMI**



**Figure 5 Scatterplot of Child and Maternal haemoglobin levels**



#### **4.17 Association between Nutritional status of mother and child with income, expenditure and food security**

There were no significant associations between income, expenditure and food security with mother and child nutritional status.

## **Annex 1 Calculation of Worth of Assets, Monthly Income and Expenditure**

### **A. Assets**

Twenty-seven different household assets were identified :-

1. Land – (Owned & Mortgaged Out)
2. Land (Mortgaged-In)
3. Cattle
4. Goats and Sheep
5. Chicken / Duck / Pigeon
6. Rickshaw / Van
7. Boat
8. Fishing Net
9. Sewing Machine
10. Wood / Fruit Tree
11. Bed – *Khat*
12. Cot – *Palang*
13. Blanket / Warm Clothes
14. Brass / Aluminium / Steel Utensils
15. Metal Trunk / Wooden Box
16. Mosquito Nets
17. Chair / Table / Self
18. Radio
19. TV
20. Jewellery
21. Bicycle
22. Cattle / Goat Shed
23. Poultry Shed / Case
24. Mobile
25. Homestead Building Material (e.g. tin sheets, bamboo and wood)
26. Tools
27. Other Major Assets (specify)

of which items 1-10 and 20 were defined as productive assets.

The Taka value of each asset was determined from and the total value of household assets (sum of Taka value of all 27 items) and total value of all productive assets (sum of Taka value of 11 items) were calculated.



## B. Income

CLP-1 based household income on six items.

1. Household total net cash income earned over the 30 days prior to the survey for all household members (adults and children) from all **regular** activities.
2. Household total in-kind income earned over the 30 days prior to the survey for all household members (adults and children) from all **regular** activities.
3. Household total cash income earned over the 30 days prior by all household members from all **irregular** activities.
4. Household total in-kind income earned over the 30 days prior to the survey for all household members from all **irregular** activities.  
(irregular activities were defined as cash or in-kind from the following sources:-  
Manure sale, Milk sale, Ploughing sale, Insemination service sale, Livestock sale, Poultry Product sale, Poultry sale, Fish sale, *Kantha* Sewing, Shop / Business, Tree (other than fruit) sale, Fruit sale, Spices sale, Field Crop sale, Vegetable Crop sale, NGO (other than CLP), GoB Stipend / Relief / Pension, CLP, Dowry, Begging, Remittance, Gleaning, Gift, Help, Income from Service, Other activities)
5. Any loan(s) taken.
6. Cash loan repayment received.

## **C. Expenditure**

CLP-1 based household expenditure on 5 items.

1. Expenditure of Food items in the 30 days prior to the survey. Expenditure on food and food related items (Rice, Wheat /Other Cereals, Pulses/Beans/Nuts, Milk/Milk Products, Meat, Poultry, Eggs, Fish & Seafood (fresh/dried), Potato (including Sweet Potato), Dark Green Vegetables – Leafy, Other Vegetables, Sugar/Honey, Fruits, Oil, Spices, Fuel (firewood, kerosene, cow dung), and Other Food Items) were obtained and sum of all 17 food expenditure items was calculated.
2. Expenditure on Household, Agriculture and Social Events in the 30 days prior to the survey. Expenditure on the following items Health Costs, Education, Clothes, Household Goods, Agricultural Inputs, Transport, Livestock Feed and Treatment Costs, Livestock Purchase, Poultry feed and treatment costs, Poultry purchase, Land or Pond share/ lease/ mortgage /purchase, House Repair/ Materials, Own Marriage Cost (including dowry out), Social occasions, Tobacco/betel nut/betel leaf, Cosmetics (oil, soap, creams, etc.), and Other Expenditures were obtained and the sum of all 17 items was calculated.
3. Amount of cash loan(s) the household repaid in the 30 days prior to the survey.
4. Amount household lent to others in the 30 days prior to the survey.
5. Amount the household saved in cash in the 30 days prior to the survey.