



Government of Bangladesh



Chars Livelihoods Programme

Socio-economic characteristics and nutritional status of households recruited in CLP2.1; report of the baseline survey conducted in April 2010



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1 Executive Summary

During April and May 2010 a baseline socio-economic and nutrition survey was conducted on a random sample of 405 newly recruited CLP 2.1 households. The main findings are as follows:

- Information was collected on 1583 individuals, of whom 832 were adults (15 years of age and above), 490 were children aged between 5-15 years, and 261 were under 5 year old children;
- 17.5% of households were female headed and average household size was 3.91, with male headed households having, on average, nearly two more family members than female headed households;
- Overall nearly 80% of household heads had not been to school; 52% of school aged children went to school and there was no gender difference in school attendance;
- 3.8% of household members reported having some disability, more so in adult males than females;
- Mean number of infections reported by households in the 30 days prior to the survey was 0.75 infections per household with 53.1% of households reported having one or more infections. Fever was the most common condition (50.4%) followed by dysentery (10.4%), diarrhoea (7.7%), Respiratory Tract Infection (4.0%), skin infection (2.0%) and 0.2% reported passing worms;
- 80% of male heads were employed as day labourers (39%, female heads). 86.2% of all adult males had worked for cash in the 30 days prior to the survey (23.6% adult females) and overall 3.7% were unemployed;
- Average land occupied by a homestead was 4.8 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 5 years. 48.4% had their floor submerged during the 2007 floods;
- 83.7% of households had a raised plinth of which 57.3% were provided by CLP.
- 21% of households had access to a sanitary latrine but open defecation was practised by over 1 in 5 adults and nearly two-thirds of children;
- 28.5% of households had soap or ash close to the latrine, only 11.4% of females reported using soap or ash before food preparation increasing to 31.3% after cleaning the child's anus;
- Only 17.5% of tube wells were observed to have a protective cement platform and only 6.1% of households with access to a tube well had a platform on a raised plinth;
- Nearly 92% of households were within a 10 minutes round trip of a water source;
- 71.6% of households had cash savings averaging 554 Taka (mean 397 Taka for all households) and 12% of households had taken out a loan (average 1212 Taka) in the last 30 days;

- Mean value of total assets was 1970 Taka of which productive assets were worth, on average, 871 Taka;
- Mean per capita income was 21.8 Taka pppd based on criteria used during CLP1;
- Mean per capita expenditure was 18.3 pppd based on criteria used during CLP1. Food costs accounted for 1295 Taka, 64.2% of total household expenditure and more so in female headed households (72.5%);
- Food diversity was generally poor with very little consumption of animal protein in the 7 days prior to the survey. The mean number of food groups consumed was only 5.7 (maximum 13);
- Nearly 85% of households ate smaller food portions and 76% 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 3.1;
- Nutritional status of the mother was poor; 40.3% had Chronic Energy Deficiency as defined by a Body Mass Index (BMI) < 18.5 (mean 19.1 kgm⁻²) and 47.1% were anaemic (mean haemoglobin level 119.6 g/dl). Overall 67.7% of mothers had a BMI <18.5 or were anaemic;
- Nutritional status of < 5 year old children was very poor; 53.6% were stunted (mean height-for-age -2.01), 45.8% were underweight (mean weight-for-age -1.97) and 20% were wasted (mean weight-for-height - 1.19). 64.8% of children were either stunted, underweight or wasted. 52% were anaemic (mean haemoglobin 106.3 g/dl) and 81.7% were either stunted, underweight, wasted or anaemic;
- 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 0.23 g/dl;
- There was a positive association between expenditure on food and improvement in child height-for-age and each additional 1000 Taka spent on food was associated with an increase in height-for-age of 0.21 standard deviations;
- Mothers who ate smaller or fewer meals had significantly lower haemoglobin levels than mothers who ate normally. Children were more likely to be wasted if they had eaten fewer meals

CLP2.1 Households by Key Indicators

Area of Focus	Indicator	CLP2.1
Income/Expenditure/Savings	Mean per capita income (Taka)	21.8
	Mean per capita expenditure (Taka)	18.3
	% of households with cash savings	71.6%
	Mean value of cash savings (Taka) for households with savings (all households)	554 (397)
Nutrition Mother Child	- mean BMI	19.1
	- % with BMI < 18.5	40.3%
	- mean haemoglobin level	119.6
	- % anaemic	47.1%
	- mean height-for-age z-score	-2.01
	- % stunted	53.4%
	- mean weight-for-age z-score	-1.97
	- % underweight	45.8%
	- mean weight-for-height z-score	-1.19
	- % wasted	20.0%
- mean haemoglobin level	106.3	
- % anaemic	52.0%	
Food Security	Mean household expenditure on food during the 30 days before the survey	1295
	Mean number of food groups consumed during the 7 days before the survey	5.7
	Mean number of food coping strategies used during the 7 days before the survey	3.1
Livelihood assets	Mean value of productive assets	871
	Mean value of total assets	1970
	% of households on raised plinth	83.7%
	% of households with access to a sanitary latrine	21.0%
	% of households with access to a tubewell with a platform on a raised plinth	6.1%
Risk Preparedness	% of households who had their floor submerged during the 2007 flood	48.4%
Infections, Health and Hygiene	Mean number of infections reported by household during the 30 days before the survey	0.75
	% of households reported as having 1+ infections	53.1%
	% of households reported having Diarrhoea in the 30 days before the survey	7.7%
	% of households reported having Dysentery in the 30 days before the survey	10.4%
	% of households reported having Fever in the 30 days before the survey	50.4%
	% of households reported having RTI in the 30 days before the survey	4.0%
	% of households reported having Skin Infection in the 30 days before the survey	2.0%
	% of households reported having Passed Worms in the 30 days before the survey	0.2%
	% of households reported that adult males practice open defecation	26.8%
	% of households reported that adult females practice open defecation	21.2%
	% of households reported that children practice open defecation	66.9%
	% of households where soap or ash is closed to the latrine	28.5%
	% of households where the female reports using soap or ash before preparing food	11.4%
% of households where the female reports using soap or ash after cleaning a child's anus	31.3%	

2 Background and aims of the biannual surveys

The aim of the biannual surveys is to monitor the changes in the socio-economic and nutritional status of a random sample of newly recruited CLP households over the next six years. CLP is focussing on improvements covering 11 areas :-

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 known (d) females report violence (physical, verbal and sexual) and percentage of women (a) that can identify and feel confident to access 2+ sources of support and redress and (b) aware of laws related to dowry and early marriage

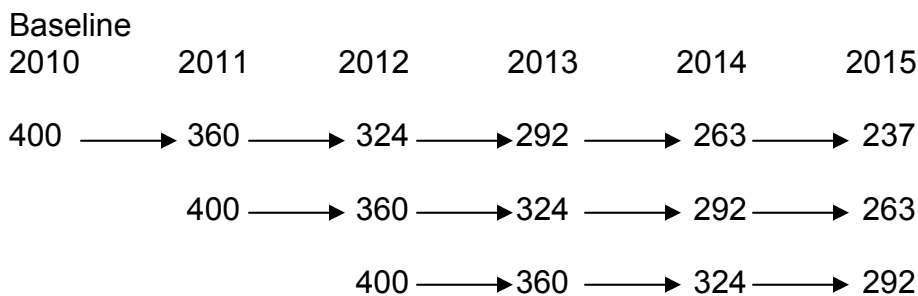
This report is able to provide information on indicators 1-8 above.

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. These sampled households will be monitored until 2016 (biannually for socio-economic indicators and annually for nutrition indicators) Each 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



A random sample of 405 households took part in the survey which was conducted during April and May 2010. Socio-economic data were collected through a pre-tested structured questionnaire, by experienced enumerators from a company called Grameen Bikash Foundation (GBF). The mother and their < 5 year old children had their height and weight measured by CLP's Community Development Organisers with supervision from the Data Entry and Monitoring Officers. The haemoglobin level was also obtained from a finger prick of blood and anaemic status determined.

Cohort 2.1 comprised a total of 5,004 households from island char villages in Kurigram and Gaibandha. Many of these households (3,632) were already residing in 'CLP1' villages i.e. where support had been provided during the first phase of the Programme. Out of the 405 households sampled during this survey, 87.9% were from 'CLP1' villages and 12.1% were from villages that had not previously received support from the Programme.

Ethical permission for the survey was obtained from the Bangladesh Medical Research Council.

4 Results

4.1 Household socio-demographic characteristics

A total of 405 households took part in the survey, 116 from Gaibandha (28.6%) and the remainder from Kurigram (289, 71.4%). Information was collected on 1583 individuals, 832 adults (defined as 15+ years of age), 490 children aged between 5 and 15 years of age and 261 under 5 year old children. The overall sex ratio was 0.98:1.00 (male: female) but in adults there were significantly more females (n=449) than males (n=383, $p < 0.025$ ¹).

Over 17% (Table 1) of households had a female head compared with 10.2% nationally (Household Income and Expenditure Survey, HIES, 2005). Female heads were primarily widowed (62%) or divorced/abandoned (26.7%) and only 8.5% were married, while nearly all male heads were married (99.1%). 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 40.6 years but female heads were significantly older by, on average, 4 years than male heads ($p = 0.032$).

The overall mean family size was 3.91 (range 1-8) which is lower than the national figure of 4.85 (HIES, 2005). Female headed households had, on average, 1.8 fewer family members than male headed households (2.38 versus 4.23, $p < 0.001$). Female headed households had fewer adults, children 5 to 15 years of age and under 5 year old children. Nearly three-quarters of female headed households had no other adult member compared with 0% in male headed households (Table 1).

¹ Here and elsewhere in this report the p (probability) value is quoted. A p value of < 0.05 implies a significant difference between the items being compared. So the number of males and females are not the same (which is expected by a sex ratio of 1:1) and there is an excess of females. As the p value becomes smaller so the result becomes more significant. So a p value of 0.025 implies that 1/40 times this result occurs by chance alone, but if the p value was 0.001, then this result only occurs 1/1000 by chance.

Table 1 Socio-demographic characteristics of male and female headed households

Variable	Head of Household		p	Total (n=405)
	Male n=334 (82.5%)	Female n=71 (17.5%)		
Marital Status (%)			<0.001	
Married	99.1	8.5		83.2
Unmarried	-	2.8		.5
Divorced	-	12.7		2.2
Abandoned	-	14.0		2.5
Widowed	0.9	62.0		11.6
Total	100.0	100.0		100.0
Mean Age	39.9	43.9	0.032	40.6
Mean Family Size	4.23	2.38	<0.001	3.91
Number of adults (%)			<0.001	
1	0	73.2		12.8
2	85.0	21.2		73.8
3+	15.0	5.6		13.4
Total	100.0	100.0		100.0
Number of children 5 to 15 years (%)			<0.001	
0	34.4	54.9		38.0
1	25.7	23.9		25.4
2	21.6	14.1		20.3
3+	18.3	7.0		16.3
Total	100.0	100.0		100.0
Number of children < 5 years			<0.001	
0	37.7	80.3		45.2
1	50.9	18.3		45.2
2	11.4	1.4		9.6
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 schooling compared with under a quarter of non-head female adults.

Table 2 Education by Gender

Variable	Gender		p	Total
	Male	Female		
Education – head			0.018	
None	76.9	91.6		79.5
1-5 years	15.3	7.0		13.8
6+ years	7.8	1.4		6.7
Total	100.0	100.0		100.0
Education all adults (%)			ns	
None	71.5	73.7		72.7
1-5 years	18.0	19.6		18.9
6+ years	10.4	6.7		8.4
Total	100.0	100.0		100.0
Education – adults non head (%)			<0.001	
None	34.7	70.4		41.0
1-5 years	36.7	22.0		34.1
6+ years	28.6	7.6		24.9
Total	100.0	100.0		100.0
Education - children 5 to 15 years (%)			ns	
None	49.8	45.8		48.0
1-5 years	46.8	48.0		47.3
6+ years	3.4	6.2		4.7
Total	100.0	100.0		100.0

Of the children 5 to 15 years of age 89% were from male headed households (436 children, 233 boys and 203 girls) while children from female headed households accounted for the remaining 11 % (32 boys and 22 girls). Overall 52% of school aged children went to school (Table 3) and there was no significant difference in school attendance between male and female headed households. However, significantly less girls than boys went to school in female headed households (27.3% versus 59.3%) and significantly more girls in male headed households went to school (57.1%) compared with girls from female headed households (27.3%).

Table 3 Percentage of boys and girls 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	51.1	48.9	42.9	57.1	ns	47.2	52.8
Female	40.7	59.3	72.7	27.3	<0.025	53.7	46.3
p by head of household	ns		0.01			ns	
Total	50.2	49.8	45.8	54.2	ns	48.0	52.0

4.3 Disability and Infection

For all household members 3.8% were reported as having some disability, but more so in adult males than females primarily due to greater physical disability and more chronic illness (defined as persistent illness for the last three months or longer) in adult males. There was no significant difference in reported disability between male and female household heads and about 1 in 20 were suffering from some health condition mainly caused by chronic illness or blindness (Table 4). There were no significant differences in health status between boys and girls in either age group (5 to 15 years of age or under 5 years of age). When all household members were combined together females were found to have significantly better health status.

The households were also asked about their health condition (infections) over the last 30 days (Table 5). Overall three quarters of household members were free of infections. About 1 in 3 adults were suffering from one or more infections in the last month compared with 1 in 4 children < 5 years of age and about 1 in 7 children 5 to 15 years of age.

The mean number of infections reported by households in the 30 days prior to the survey was 0.75 infections/household and 53.1% of households reported having one or more infections. Fever was the most common infection (50.4%) followed by dysentery (10.4%), diarrhoea (7.7%), Respiratory Tract Infection (RTI) (4.0%), skin infection (2.0%) and 0.2% 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	94.3	94.4	94.3	94.0	96.7	95.5	97.4	98.2	97.8	97.0	96.0	96.5	95.5	96.9	96.2
Blind	0.3	2.8	0.7	0.5	1.3	0.9	1.1	0.4	.8	2.2	1.6	1.9	1.0	1.1	1.1
Physical disability	1.2	0	1.0	1.3	0.2	.7	0	0.4	.2	0	2.4	1.2	0.6	0.6	0.6
Psychological disorder	0.6	0	0.5	0.8	0.4	.6	0.8	0.4	.6	0.7	0	.4	0.6	0.4	0.5
Deaf	0	0	0	0	0.7	0.4	0	0	0	0	0	0	0	0.4	0.2
Dumb	0	1.4	0.3	0	0.2	0.1	0.8	0	0.4	0	0	.0	0.3	0.1	0.2
Chronic illness	3.6	1.4	3.2	3.4	0.4	1.8	0	0.9	.04	0	0	.0	1.9	0.5	1.4
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
p	ns			<0.001			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	All household members
Diarrhoea	3.0	1.2	3.5	7.7
Dysentery	4.0	1.0	5.4	10.4
Fever	22.0	10.1	18.3	50.4
Respiratory Tract Infection	1.7	0.7	1.5	4.0
Skin infection	0.2	1.5	0.2	2.0
Passed worms	0	0	0.2	0.2
Number of infections				
0	69.6	86.4	74.8	46.9
1	29.9	12.6	21.2	34.8
2+	0.5	1.0	4.0	18.3

4.4 Employment

Overall 3.7% were unemployed and over 41.9% of all working adults were employed as a day labourer and 42.9% were engaged in housework. There were highly significant differences in occupations between male and female workers, both heads of households and for all adults.

Over 80% of male heads reported their main occupation as a day labourer compared with 39% of female heads (Table 6). Female heads other main occupations were as a domestic maid or housework. Of the 8 (2.4%) unemployed male heads, 4 were suffering from physical disability or chronic illness. The reported occupation of the other adult males also tended to be a day labourer while females were engaged in housework.

Information was also collected on the main paid occupation in the 30 days prior to the survey (Table 7). 91% of male household heads had a paid occupation compared with only 73.2% of female heads. 1 in 13 heads had two paid occupations in the month prior to the survey. Overall 86.2% of all adult males had worked for cash in the last month compared with only 23.6% 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 (16.5 versus 14.3 days, respectively, $p = 0.022$). Overall male adults worked, on average, over 2 days more than female adults (16.5 versus 14.2, $p = 0.020$) in the previous 30 days. Overall, on average, 1.8 adults were in paid work during the last 30 days

The majority of children aged between 5 and 15 years of age were reported to be students (66.9%) and only 11 were engaged in cash income work the previous 30 days, 7 as agricultural day labourers, 3 as non-agricultural day labourers and 1 as a fisherman.

Table 6 Main reported occupation of Adults

Main occupation (%)	Head of Household		All adults		
	Male N=334	Female N=71	Male N=383	Female N=449	Total
Work own land	-	-			
Agriculture day labourer	69.2	16.9	65.3	4.2	32.3
Non-agriculture day labourer	15.6	22.5	14.6	5.4	9.6
Weaver	1.8	-	2.1	.0	1.0
Maid	-	25.4	.0	4.2	2.3
Rickshaw puller	3.6	-	3.1	2.5	2.8
Fisherman	1.8	-	2.1	.0	1.0
Housework	1.8	29.5	1.8	78.0	42.9
Service	0.3	-	.8	.2	.5
Small trader	3.3	-	3.1	.0	1.4
Beggar	0.3	5.6	.3	1.6	1.0
Student	-	-	1.6	1.6	1.6
Unemployed	2.4	-	5.2	2.5	3.7
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=304	Female N=52	Male N=330	Female N=395	Total N=725
Work own land	-	-	-		
Agriculture day labourer	64.8	21.2	63.3	19.2	39.3
Non-agriculture day labourer	24.0	40.4	24.9	58.7	43.3
Weaver	1.6	-	2.7	1.8	2.2
Maid	1.3	34.6	1.5	18.0	10.5
Rickshaw puller	2.6	-	2.4	.0	1.1
Fisherman	2.3	-	2.1	.0	1.0
Housework	-	-	-	-	-
Service	-	-	-	-	-
Small trader	-	-	-	-	-
Beggar	-	-	-	-	-
Student	-	-	-	-	-
Other	3.3	3.8	3.0	2.3	2.6
p	<0.001		<0.001		

4.5 Household land ownership and access

The average land occupied by a homestead was 4.80 decimals, and male headed households had significantly more homestead land, on average, than female headed households (4.93 versus 4.17 decimals, $p=0.008$).

Very few households had any cultivable land (Table 8).

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

Source	N	Mean
Own	-	-
Mortgage out	-	-
Mortgage in	6	7.3
Share out	2	11.0
Share in	15	19.0
Lease out	-	-
Lease in	1	8.0
Khas	1	2.0

4.6 House ownership and structure

On average households had lived at their homestead for 5 years (range 10 months to 31 years), female headed households more so, on average, than male headed households (6.4 years versus 4.7 years, $p=0.012$).

12 households did not have their own homestead and were living with another household. Most homesteads were constructed of a corrugated iron/tin roof, either jute stick, straw or tin sheet for the walls and all households had a dirt floor (Table 9). There were no significant differences in homestead construction by head of household.

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

Material (%)	Roof	Wall	Floor
Corrugated iron/tin sheet	82.2	17.5	-
Bamboo	-	1.5	-
Straw	9.1	24.2	-
Jute Stick	5.7	53.8	-
Dirt	-	-	97.0
Living with another household	3.0	3.0	3.0
Total	100.0	100.0	100.0

Overall 83.7% of households had a raised plinth of which 57.3% were provided by CLP. No significant differences were found between male and female headed households in having a raised plinth.

In the last flood 17.3% of the households ($n=70$) did not exist. Based on all households ($n=450$) 19.3% reported that the floor of their current homestead was submerged under water and based on households that existed at the time ($n=335$) 23.3% were submerged; nearly half of these households (9.4%) had to temporarily move to another area. In the 2007 flood nearly half of households flooded (48.4%) and of these over half (25.2%) had to move to another area. On

average, households had moved 3 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.

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 17.5% of tube wells were observed to have a protective cement platform and 41.2% of tube wells were on a raised plinth. Only 6.1% of households had a platform on a raised plinth. Overall just over a quarter of households owned or shared ownership of a tube well, but there was a very marked difference between male and female headed households with one third of male headed households owning or sharing ownership of a tube well compared with only 1 in 10 of female headed households (Table 10). There was no significant difference in the percentage of CLP provided tube wells between male and female headed households.

Table 10 Water source and sanitary latrine

Variable	Head of household		p	All households
	Male	Female		
Water source (%)			<0.001	
Own	26.9	8.5		23.7
Shared ownership	5.1	1.4		4.4
Owned by other	68.0	90.1		71.9
CLP provided (%)			ns	
No	97.6	95.8		97.3
Yes	2.4	4.2		2.7
Mean time to water source (minutes)	4	6	0.004	4.4
% within 10 minutes round trip of water source	93.1%	85.9%	<0.05	91.9%
Used water purification (%)	0	0	-	0
Access to safe drinking water	5.5%	5.6%	ns	5.6%
% access to a sanitary latrine	22%	17%	ns	21%

Female headed households had to walk, on average, 2 more minutes than male headed households, in order to obtain their drinking water; 93.1% of male headed households were within a 10 minute round trip of a water source compared with 85.9% of female headed households. No households used any chemicals to purify their water. Overall about 1 in 18 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 21% of households had access to a sanitary latrine 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 child were generally poor and only 11.4% reported using soap or ash before food preparation (Table 11). Just under a third of females (30.8%) 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	11.1	4.2		9.9	7.1	12.5
Ash	1.8	0		1.5	1.2	2.1
Water only	32.6	26.8		31.6	30.6	33.3
Not wash	54.5	69.0		57.0	61.2	52.1
Total	100.0	100.0		100.0	100.0	100.0
Before eating			ns			
Soap	12.7	16.5		16.5	18.8	16.7
Ash	-	-		-	-	-
Water only	87.3	83.5		83.5	81.2	83.3
Not wash	-	-		-	-	-
Total	100.0	100.0		100.0	100.0	100.0
Before serving food			ns			
Soap	2.7	-		2.2	3.5	2.1
Ash	0.3	-		0.2	-	-
Water only	22.8	22.5		22.7	16.5	30.2
Not wash	74.3	82.5		74.8	80.0	67.7
Total	100.0	100.0		100.0	100.0	100.0
After defecation			0.035			
Soap	18.0	9.9		16.5	20.0	18.8
Ash	69.2	64.8		68.4	72.9	69.8
Water only	4.8	9.9		5.7	1.2	6.3
Not wash	8.1	15.5		9.4	5.9	5.2
Total	100.0	100.0		100.0	100.0	100.0
Before feeding child			ns			
Soap	4.7	6.3		4.8	5.1	7.8
Ash	0.5	-		0.4	-	-
Water only	16.4	6.3		15.7	15.4	19.6
Not wash	78.4	87.4		79.0	79.5	72.5
Total	100.0	100.0		100.0	100.0	100.0
After washing child's anus			ns			
Soap	8.5	6.7		8.4	7.9	11.8
Ash	23.1	20.0		22.9	23.7	23.5
Water only	2.4	-		2.2	5.3	2.0
Not wash	66.0	73.3		66.5	63.2	62.7
Total	100.0	100.0		100.0	100.0	100.0

Significantly more females from male headed households washed their hands after defecation with soap or ash than females from female headed households (87.2% versus 74.7%, 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 28.5% of these households had soap or ash at the latrine and of the households with a tube well less than 50% of these households had soap or ash at the tube well (Table 12). In female headed households with a latrine no soap or ash was available while in male headed households with a latrine soap or ash was available in a third of households. 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	10.0	-		9.4
Ash	36.7	33.3		36.5
No	53.3	66.7		54.2
Total	100.0	100.0		100.0
Latrine (%)			<0.001	
Soap	2.6	-		2.1
Ash	31.6	-		26.4
No	65.8	100.0		71.4
Total	100.0	100.0		100.0

4.7.3 Defecation practices

Overall a quarter of all adults (males 26.8%, females 21.2%) practiced open defecation increasing to 51.5% in children (Table 13). 27.5% of adults used a sanitary latrine (a latrine with cement slab platform and unbroken seal covered by tin or corrugated iron sheeting or bamboo superstructure) while 27.6% used an unhygienic latrine and a further 20.1% used a pit latrine (a simple hole in the ground, with or without a cement platform or superstructure). For children nearly 16% defecated at the homestead, and a further 20% used either a pit latrine or an unhygienic latrine.

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	5.5	5.2	5.3
	Other sanitary latrine	21.3	23.0	22.2
	Pit latrine	19.4	20.7	20.1
	Latrine unhygienic	26.0	29.1	27.6
	River/pond	1.1	0.7	0.9
	Open defecation	26.8	21.2	23.9
	Total	100.0	100.0	100.0
Children	Own sanitary latrine			2.0
	Other sanitary latrine			2.0
	Pit latrine			4.1
	Homestead			15.9
	Latrine unhygienic			9.0
	River/pond			-
	Open defecation			66.9
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 871 Taka and non-productive assets of 1099 Taka. Male headed households had over double the worth of productive assets and nearly twice as much non-productive assets as female headed households. Total worth of all assets was 1970 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	958	465	<0.001	871
Non-productive	1195	646	<0.001	1099
Total	2153	1111	<0.001	1970

4.9 Savings and loans

Overall 71.6% of households reported having some savings significantly more so in male headed (75%) than female headed (59%, $p < 0.01$) households. The average amount saved was 554 Taka (Table 15) for those households with savings, and the mean fell to 397 when all 405 households were considered. Among those with savings male headed households savings were, on average, double those of female headed households. Savings in the last month averaged

432 Taka for those who had saved and these were also significantly greater in male than female headed households (470 versus 211 Taka, respectively). The mean savings for all households was 303 Taka.

One third of households had a loan, more so in male than female headed households (35% versus 23%, respectively, $p < 0.05$). The amount of the loans taken was not significantly different by head of household. Only 2.4% and 4.2% of male and female headed households respectively had given loans to others.

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 (334)		Female (71)				
	n	Mean amount (Taka)	N	Mean amount (Taka)			
Savings	248	599	42	289	0.002	554	397
Informal interest free loan	93	911	12	380	ns	850	220
Informal with interest loan	16	1847	1	3000	ns	1915	80
Interest loan CBO etc.	1	1000	-	-	-	1000	2
Loan given to others	8	381	3	367	ns	377	10
Loans during the last 30 days							
Loan taken	43	1277	5	650	ns	1212	144
Cash loan repayment	52	778	5	320	ns	737	104
Loan given to others	6	142	2	500	ns	232	5
Cash loan repayment received	5	156	-	-	-	156	2
Savings in last 30 days	242	470	42	211	0.001	432	303

In the 30 days prior to the survey nearly 12% of households had taken out a loan and the mean amount of 1212 Taka did not differ between male and female heads of household. Overall 14% of households had made a cash repayment on a loan, averaging 737 Taka. About 2% of households had loaned money to others and the amount was greater in female headed households. Only male headed households (1.5%) had received a cash repayment in the last 30 days.

4.10 Household income

CLP1 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 repayment received. Full details of how household income was calculated are provided in Annex 1. Based on this approach, the overall income of the households was 2382 Taka/month (Table 16) but male headed households had a much higher mean monthly income than female headed households (2633 versus 1198 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 21.8 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, 47.9% 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 Taka
	Male Taka	Female Taka		
Adults				
Cash	2155	615	<0.001	1885
In-kind	63	166	0.014	81
Children				
Cash	24	75	ns	33
In-kind	0	3	ns	1
Irregular				
Cash	189	165	ns	185
In-kind	35	128	<0.001	51
Loan taken	165	46	0.008	144
Loan payment received	2	0	ns	2
Total	2633	1198	<0.001	2382
Per capita income/day	22.3	19.7	ns	21.8

Table 17 Percentage of households in the lowest income decile

Criteria	Male	Female	p	All households
CLP 1	25.7	78.9	<0.001	35.1

Compared with the national rural mean monthly income of 7203 Taka (HIES, 2005) overall 35.1% (CLP) of all households were in the lowest household income/month decile (Table 17). There was a very marked difference between male and female headed households with between a quarter and just over a third of male households being in the lowest decile compared with between nearly 80% and 90% of female headed households.

4.11 Household expenditure

Household expenditure during CLP1 (see Annex 1 for details) was calculated over the previous 30 days. Overall household expenditure of CLP 2.1 households was 2049 Taka which was significantly higher, on average, in male headed

households (Table 15). Cost of food was the largest expenditure item in both male (62.4%) and female (72.5%) headed households and overall households spent 64.2% on food (mean food expenditure = 1295 Taka). Total expenditure per capita was 18.8 Taka, significantly higher in male headed households (19.0) than female headed households (15.1).

Table 18 Household expenditure

Item	Head of household		p	All households
	Male	Female		
Food	1427	677	<0.001	1295
Non-food (household, agriculture and social)	739	235	<0.001	650
Loan repayment	121	23	<0.001	104
Total expenditure	2287	934	<0.001	2049
Total expenditure/capita/day	19.0	15.1	0.017	18.3

Table 19 Percentage of households in the lowest expenditure decile

Criteria	Male	Female	P	All households
CLP1	71.4	98.6	<0.001	76.2

Compared with the national rural mean monthly expenditure of 6134 Taka (HIES, 2005) overall 76.2% (CLP) of all households were in the lowest household expenditure/month decile (Table 19). Nearly all female headed households were in the lowest expenditure decile compared with 71% of male headed households.

4.12 Difference between household income and expenditure

The difference in household income and expenditure (income minus expenditure) was calculated based on total income and expenditure (CLP) in the last 30 days. Households, on average, were in credit by 332.6 Taka with no significant difference between male and female headed households. Overall 76.4% of households were in credit.

Table 20 Net (mean) credit-debit

Income – expenditure	Head of household		p	All households
	Male	Female		
CLP1 criteria	+345.0	+263.7	ns	+332.6

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 animal protein in the diet. Female headed households had a worse diet than male headed households with significantly lower intake of eggs, fish, oil and

other vegetables and no fruit intake at all. The average number of different foods eaten was 5.7 but there was significantly greater diversity in male than female headed households (5.9 versus 4.9 foods eaten, respectively, $p < 0.001$).

Overall about 85% of households ate smaller food portions and 76% ate 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 7% 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 3.1 and there was no significant difference between male and female headed households.

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

Item	Head of household		P	All households
	Male	Female		
Rice			ns	
< 7 days	3.6	5.6		4.0
7 days	96.4	94.4		96.0
Total	100.0	100.0		100.0
Wheat			ns	
0	68.3	69.0		68.4
1	4.8	2.8		4.4
2	8.7	4.2		7.9
3	6.3	9.9		6.9
4+	12.0	14.1		12.3
Total	100.0	100.0		100.0
Pulses			ns	
0	71.9	78.9		73.1
1	15.0	11.3		14.3
2+	13.2	9.9		12.6
Total	100.0	100.0		100.0
Milk			ns	
0	78.7	88.7		80.5
1	12.6	4.2		11.1
2+	8.7	7.0		8.4
Total	100.0	100.0		100.0
Meat			ns	
0	96.1	95.8		96.0
1+	3.9	4.2		4.0
Total	100.0	100.0		100.0
Poultry			ns	
0	95.8	97.2		96.0
1+	4.2	2.8		4.0
Total	100.0	100.0		100.0
Eggs			0.029	
0	78.1	87.3		79.8
1	14.1	2.8		12.1
2+	7.8	9.9		8.1
Total	100.0	100.0		100.0
Fish			0.003	
0	39.2	62.0		43.2
1	31.7	16.9		29.1
2	19.5	11.3		18.0
3+	9.6	9.9		9.6
Total	100.0	100.0		100.0
Potato			0.028	
0	8.4	19.7		10.4
1	6.0	2.8		5.4
2	13.2	18.3		14.1
3	22.2	18.3		21.5
4+	50.3	40.8		48.6
Total	100.0	100.0		100.0
Dark vegetables			ns	
0	62.0	66.2		62.7
1-3	21.9	21.2		21.7
4+	16.2	12.7		15.6
Total	100.0	100.0		100.0
Other vegetables			0.004	
0	20.7	40.8		24.2
1-3	38.7	36.6		38.3
4+	40.7	22.5		37.5
Total	100.0	100.0		100.0
Sugar			ns	
0	91.6	95.8		92.3
1+	8.4	4.2		7.7
Total	100.0	100.0		100.0
Fruit			0.03	
0	93.7	100.0		94.8
1+	6.3	-		5.2
Total	100.0	100.0		100.0
Oil			<0.003	
0	3.6	8.5		4.4
1-4	9.9	19.8		11.6
5+	86.5	71.8		84.0
Total	100.0	100.0		100.0
Mean food diversity	5.9	4.9	<0.001	5.7

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			ns	
0	16.8	8.5		15.3
1	12.3	9.9		11.9
2	29.0	28.2		28.9
3	20.4	19.7		20.2
4+	21.6	33.8		23.7
Total	100.0	100.0		100.0
Number of days eat fewer meals			ns	
0	25.7	15.5		24.0
1	17.7	16.9		17.5
2	25.1	23.9		24.9
3	17.7	16.9		17.5
4+	13.8	26.8		16.0
Total	100.0	100.0		100.0
Number of days eat lower quality meals			<0.001	
0	70.1	50.7		66.7
1	13.5	14.1		13.6
2	12.6	21.1		14.1
3+	3.9	14.1		5.7
Total	100.0	100.0		100.0
Number of days eat uncultivated (wild) food			<0.001	
0	92.8	76.1		89.9
1	7.2	23.9		10.1
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	94.0	90.1		93.3
1+	6.0	9.9		6.7
Total	100.0	100.0		100.0
Number of days give more food to earning household member			<0.001	
0	50.0	91.5		57.3
1	4.8	0		4.0
2	14.7	2.8		12.6
3+	30.6	5.6		8.9
Total	100.0	100.0		17.3 100.0
Number of days sell asset to provide food			ns	
0	99.1	98.6		99.0
1+	0.9	1.4		1.0
Total	100.0	100.0		100
Number of food loans taken			ns	
0	85.3	88.7		85.9
1	8.7	11.3		9.1
2+	6.0	-		4.9
Total	100.0	100.0		100.0
Number of days food loaned out			ns	
0	96.4	98.6		96.8
1+	3.6	1.4		3.2
Total	100.0	100.0		100.0
Number of days food loan taken			ns	
0	79.6	78.9		79.5
1	9.9	12.7		10.4
2+	10.5	8.5		10.1
Total	100.0	100.0		100.0
Number of days bought food on credit			ns	
0	91.0	90.1		90.9
1+	9.0	9.9		9.1
Total	100.0	100.0		100.0
Number of days begged for food			<0.001	
0	94.0	71.8		90.1
1+	6.0	28.2		9.9
Total	100.0	100.0		100.0
Mean food shortage strategies	3.4	3.1	ns	3.1

4.13.1 Homestead gardens

Only 15 (14 male headed) (3.7%) households reported growing some produce on their homestead garden during the last 30 days. The number of different fruits, vegetables and spices ranged from 1 to 9 and the Taka value of the harvest ranged between 35 and 280 Taka (mean=110 Taka). Only two households sold any produce during the last 30 days (mean=40 Taka), 6 households loaned harvest to others (mean value=37.5 Taka) and three households reported that there were costs associated with their homestead garden (mean=175 Taka).

4.14 Nutritional Status of Mothers

4.14.1 Anthropometry

The Body Mass Index (BMI, weight (kg)/height (m)²) 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 40.3% of mothers were suffering from CED (compared with 30% in the Bangladesh Demographic Survey, 2007). Significantly more mothers living in female headed households were CED (46.5%) than mothers living in male headed households (39%).

Table 23 BMI of mothers

BMI	Head of household		p	All mothers
	Male	Female		
Mean BMI	19.2	18.7	ns	19.1
BMI categories (%)			0.043	
<16	6.0	11.3		7.1
16-16.9	8.4	16.9		9.8
17-18.49	24.6	18.3		23.5
18.5+	61.0	53.5		59.7

4.14.2 Haemoglobin level

Haemoglobin (Hb) level was obtained from a finger prick of blood. The mean haemoglobin level was 119.6 g/l just below the anaemic threshold of 120 g/l. Mothers living in female headed households had a significantly lower mean haemoglobin level than those living in male headed households (Table 24).

Table 24 Haemoglobin level of mothers

Haemoglobin	Head of household		p	All mothers
	Male	Female		
Mean haemoglobin	120.5	115.5	0.004	119.6
Haemoglobin categories (%)			0.049	
Anaemic	45.0	57.7		47.1
Normal	55.0	42.3		52.9
Total	100.0	100.0		100.0

Haemoglobin levels were categorised as severely anaemic <70 (g/l), anaemic 70 – 119.9 in females and normal, ≥120. Only two individuals had severe anaemia and overall 47.1% were anaemic. Mothers from female headed households were just significantly more likely to be anaemic (57.7%) than mothers from male headed households (45.0%).

4.14.3 Anthropometry and haemoglobin level

The relationship between haemoglobin and BMI categories is presented in Table 25. Two thirds 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	34.9	19.7	ns	32.3
Normal	CED	20.2	22.5		20.6
Anaemic	Normal	26.2	33.8		27.4
Anaemic	CED	18.7	23.9		19.7

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 250 children below 5 years of age were analysed of which 129 were boys (sex ratio (1.07:1)). The mean HAZ and WAZ were both close to -2, the cut-off for stunting and underweight, respectively, while the mean WHZ was -1.19. There was no significant difference in means between boys and girls. Boys, on average, had lower z scores for all three nutritional indicators. Overall about 53.6% of children were stunted (Table 28), 45.8% underweight and 20% wasted and more boys were severely underweight (20.9%) than girls (9.8%)

Table 27 Mean z-scores of boys and girls

Nutrition indicator	Boys	Girls	p	Total
HAZ	-2.11	-1.90	ns	-2.01
WAZ	-2.06	-1.87	ns	-1.97
WHZ	-1.29	-1.08	ns	-1.19

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	21.7	13.2	17.6	34.1	38.0	36.0	44.2	48.8	46.4	ns
WAZ	20.9	9.8	15.5	26.4	34.4	30.3	52.7	55.7	54.2	0.040
WHZ	3.9	0.8	2.4	20.9	14.0	17.6	75.2	85.1	80.0	ns

Only 35.2% of children had a normal HAZ, WAZ and WHZ (Table 29) and 1 in 8 children were stunted, underweight and wasted. Boys were over 2.5 times more likely to be stunted, underweight and wasted than girls (18.6% versus 7.4%, respectively). Over 88% of wasted children (acute undernutrition) also showed evidence of chronic undernutrition.

Table 29 Percentage of children stunted, underweight and wasted

Nutritional status	Boys	Girls	p	All children
Normal	34.1	36.4	ns	35.2
Stunted only	16.3	17.4		16.8
Underweight only	3.9	5.0		4.4
Wasted only	2.3	2.5		2.4
Stunted and underweight	20.9	26.4		23.6
Stunted and wasted	0	0		0
Underweight and wasted	3.9	5.0		4.4
Stunted, underweight and wasted	18.6	7.4		13.2
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 mean haemoglobin level in both boys and girls was below the non-anaemic cut-off of 110 g/l. No child was severely anaemic (Table 30) but overall 52% of children were anaemic, slightly more boys (53.5%) than girls (50.4%).

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	
106.1	106.5	Ns	106.3	-	-	-	53.5	50.4	52.0	46.5	49.6	48.0	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 only about three-quarters had normal nutritional status while for WHZ and haemoglobin nearly 60% had normal nutritional status. More girls than boys 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	22.8	26.9	ns	24.8
	Stunted	Normal	23.6	22.7		23.2
	Normal	Anaemic	21.3	21.0		21.1
	Stunted	Anaemic	32.3	29.4		30.9
WAZ	Normal	Normal	22.8	30.3	ns	26.4
	Underweight	Normal	23.6	19.3		21.5
	Normal	Anaemic	29.9	26.1		28.0
	Underweight	Anaemic	23.6	24.4		24.0
WHZ	Normal	Normal	35.4	41.2	ns	38.2
	Wasted	Normal	11.0	8.4		9.8
	Normal	Anaemic	40.2	43.7		41.9
	Wasted	Anaemic	13.4	6.7		10.2

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. Only 18.3% of the < 5 year old children had a normal nutritional status as defined by z-scores and haemoglobin levels and 8.5% of children were anaemic, stunted, underweight and wasted. Of the children with normal anthropometry 47.7% (16.7%/35.0%) were anaemic.

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

Anthropometry	Anaemic (%)	Non-anaemic (%)	All children
Normal	16.7	18.3	35.0
Stunted only	10.6	6.5	17.1
Underweight only	2.8	1.2	4.0
Wasted only	0.8	1.6	2.4
Stunted and underweight	11.9	12.2	24.1
Stunted and wasted	0	0	0
Underweight and wasted	0.8	3.7	4.5
Stunted, underweight and wasted	8.5	4.5	13.0
Total	52.0	48.0	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, 0.130 standard deviations (Table 33), WAZ by 0.148 and WHZ by 0.113. For each unit increase in maternal haemoglobin the child increased by 0.232 g/l.

Table 33 Relationship between mother and child nutritional status

Mother	Child	Regression coefficient (slope)	p
BMI	HAZ	+0.130	<0.001
BMI	WAZ	+0.148	<0.001
BMI	WHZ	+0.113	<0.001
Haemoglobin	Haemoglobin	+0.232	0.004

Figure 2 Scatterplot of Child HAZ by Maternal BMI

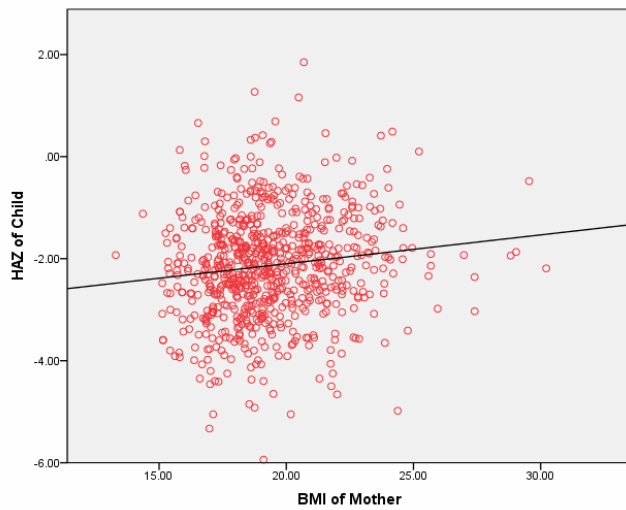


Figure 3 Scatterplot of Child WAZ by Maternal BMI

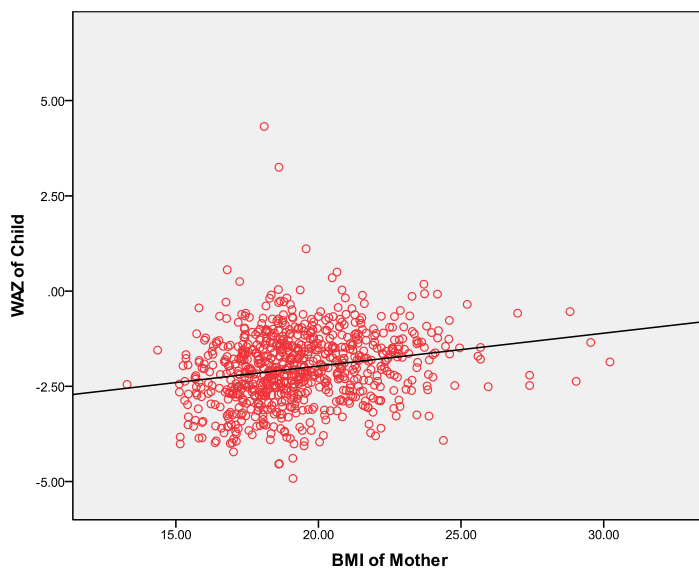


Figure 4 Scatterplot of Child WHZ by Maternal BMI

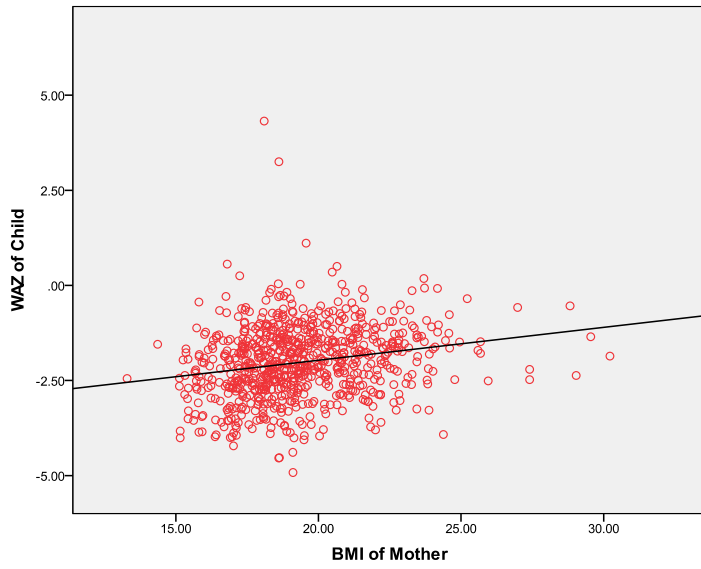
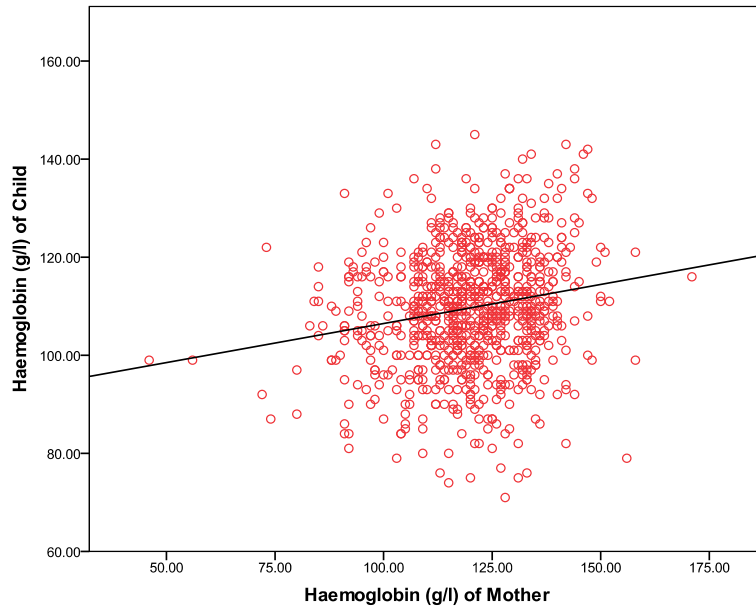


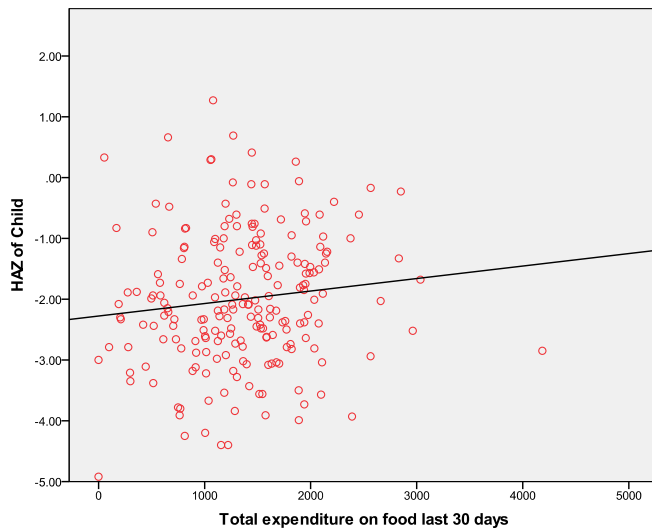
Figure 5 Scatterplot of Child and Maternal haemoglobin levels



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

There was a significant positive association between food expenditure and child HAZ (Figure 6) and each additional 1000 Taka spent on food was associated with an increase in HAZ of 0.21.

Figure 6 Scatterplot of Child HAZ and household food



There were also significant associations between eating smaller or fewer meals with mother and child nutritional status. Mothers who had not eaten smaller or fewer meals had significantly higher haemoglobin levels than mothers who ate less (Table 34). Children were significantly more wasted if they had eaten fewer meals.

Table 34 Association between mother and child nutritional status and food security

Food security	Maternal haemoglobin (mean)	p
Smaller meals		<0.001
No	124.8	
Yes	118.7	
Fewer meals		<0.05
No	121.9	
Yes	118.9	
	Child WHZ (mean)	
Fewer meals		0.011
No	-0.97	
Yes	-1.33	

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

CLP1 based household income on six items.

1. Household total 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

CLP1 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.