

# EEP/Shiree

## Change Monitoring System - CMS3 -

**Monitoring the changes in Socio-Economic &  
Nutritional status of extreme poor households  
between March 2010 and March 2011; results from  
the four panel surveys**

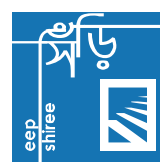
Professor Nicholas Mascie-Taylor and  
Dr Rie Goto

July 2011



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Swiss Agency for Development  
and Cooperation SDC



## Executive Summary

1. Background: The six Scale Funds are working with a total of 82,850 extreme poor households. In March 2010, 64 households from each of the six Scale Funds were randomly selected for regular follow-up. This report provides information on changes in socio-economic and nutritional status of the same households studied in March 2010 and again a year later in March 2011.
2. Attrition: 336 households took part in all four surveys conducted in March, July and October 2010 and March 2011. There was greater attrition in the urban sample (25%) than in the rural areas (9%). Information was collected on 1169 individuals of whom 679 were adults.
3. Male and female headed households and family size: In the total sample 40.8% of households were female headed and mean family size increased significantly from 3.23 in survey 1 to 3.48 in survey 4. Female headed households were smaller by, on average, 1.3 family members.
4. Schooling: Only 21.4% of heads of households had attended school significantly more so in male (28.6%) than female headed households (10.9%). Between surveys 1 and 4 school attendance increased significantly from 77.9% to 85.7% in school-aged children.
5. Chronic illness and disability: Disability prevalence did not change significantly between survey 1 and 4 and overall between 3.5% and 4% of household members were disabled mainly due to lack of mobility and vision. Prevalence of chronic illness fell very significantly from 14.8% of all household members in March 2010 to 3.4% in March 2011.
6. Morbidity status: The health status of family members was determined on the day of the survey and over the previous 7 and 30 days. For all adults, cough, eye infection and passing of worms all fell, and skin infection increased. In children 5 to 15 years of age the prevalence of fever and cough both fell between surveys 1 and 4. The only significant change in under 5 year old children was the reduction in passing of worms.
7. Employment: Unemployment fell to zero and petty trading increased substantially in both male and female headed households. Begging still remained an important source of income in female headed households. Between surveys 2 and 4 self employment increased in male headed households. The number of days worked increased significantly between surveys 3 and 4 while advanced sale of labour fell from 3% to <1%.
8. Land ownership: Households owning land increased significantly from 14.6% in survey 1 to 28.3% in survey 4.
9. Household ownership, size and structure: Average house size increased from 13.9 square metres to 15.3 square metres between survey 1, but the increase was only significant in male headed households. There was no significant change in materials used in house construction
10. Electricity, water supply and defecation practices: In rural areas about 95% of households had no electricity supply compared with 68% nationally whereas 86% of urban dwellers (88% nationally) had access

to electricity. There was a highly significant reduction of open defecation and increase in ring/slab latrines in rural areas. No change in water supply occurred.

11. Loans: In survey 1, 37% had cash savings and in survey 4 100% of households had cash savings and the mean amount increased significantly from 444 Taka (n=124, in survey 1) to 1103 Taka (n=336, in survey 4).
12. Assets: There were highly significant increases in the value of assets between surveys 1 and 4 and in the total sample the value rose from a mean of 2296 Taka to 9012 Taka with no significant difference in asset value between male and female headed households in survey 4.
13. Income: In the total sample mean income increased from 1702 Taka/month in survey 1 to 2791 Taka/month in survey 4. This increase was mainly due to the much higher income in the urban areas (over 1200 Taka/month higher). In the rural areas only mean income remained stable in surveys 1 to 3 at around 1400 Taka/month but increased significantly in survey 4 to 2203 Taka/month. Similar trends were found for per capita income. In rural areas the percentage of households below 22 Taka pppd income remained stable at about 70% for surveys 1 to 3 but fell to 50% in survey 4; with a 26 Taka pppd threshold 80% of households were below the threshold in surveys 1 to 3 falling to 62% in survey 4. In urban areas the percentage below 26 Taka pppd fell from over 50% in survey 1 to under 30% in surveys 2 and 3 and then to 19% in survey 4; the equivalent percentages for 30 Taka pppd were 60% in survey 1, 33% in surveys 2 and 3 and 21% in survey 4.
14. Expenditure: Total expenditure fell between surveys 1 and 2 (2128 and 1890 Taka/month, respectively) and then increased in surveys 3 and 4 (2363 and 2631 Taka/month, respectively). With a 24% increase in expenditure between surveys 1 and 4. Male headed household expenditure was significantly greater than female headed by, on average, 1168 Taka. Expenditure in urban areas was double that found in the rural areas. There was a significant fall in the percentages below the 22 and 26 Taka pppd thresholds in the rural areas only in survey 4, whereas the percentages below the urban thresholds (26 and 30 Taka pppd) fell consistently from 25% and 43.8% (respectively) in survey 1 to 10.4% in survey 4.
15. Difference between income and expenditure: The difference between household income and expenditure (credit/debit balance) was calculated for each household and the overall mean changed from a debit of -168 Taka in survey 1 to credit (+10, +228 and +641 Taka in surveys 2 to 4, respectively). When the average of the four surveys was calculated all NGO means were in credit except for SCF (-256 Taka/month).
16. Household food intake and security: Food diversity was poor especially in rural areas but in survey 4 egg and poultry consumption increased significantly. In the total sample the mean number of foods consumed in the last 7 days (maximum 13) increased from 5.9 in survey 1 to 7.1 and 7.0 in surveys 2 and 3 and fell to 6.7 in survey 4. Mean food diversity followed a similar pattern being least in survey 1 (4.3) increasing to 5.0 in survey 2 and falling to 4.9 and 4.8 in surveys 3 and 4, respectively.

The urban area had the highest mean for food diversity and number of different foods consumed. Food coping strategies showed significant improvement and mean coping strategies fell from 3.3 to 2.2 between surveys 1 and 4.

17. Social empowerment: There was little change in male responses between surveys 1 and 4. However less women felt that they did not have people outside their family who could be relied on
18. Adult nutritional status: In the total sample mean weight increased by 0.3kg between surveys 1 and 4 and BMI increased by 0.2 units. There was no significant change in haemoglobin concentration between surveys.
19. Child nutritional status: In the rural sample mean height-for-age worsened significantly between surveys 1 and 4. Mean height-for-age was worse in the urban areas in both surveys and weight-for-age was worse in the urban areas in survey 4 only. Mean haemoglobin improved significantly between the two surveys in both urban and rural samples and overall the improvement averaged 4 g/l with a concomitant reduction in anaemia of 13%, from 55.1% to 42.1%.

## 1. BACKGROUND

EEP/shiree ([www.shiree.org](http://www.shiree.org)) is a challenge fund supported by UKaid from the Department for International Development (DFID) in partnership with the Government of Bangladesh (GoB) to lift 1 million people out of extreme poverty by 2015. Harewelle International Ltd and PMTC Bangladesh Ltd manage the fund in consultation with EEP/shiree consortium partners including the Centre for Development Studies (CDS) at Bath University, the British Council and Unnayan Shamannay. EEP/shiree is one in DFID's portfolio of projects designed to reduce extreme poverty and vulnerability in Bangladesh.

The EEP/shiree Challenge Fund is worth £65 million British Pounds (around USD\$130M) and is being disbursed over a period of 8 years (2008-2015). It is also referred to as shiree (the Bengali word for steps and an acronym for "Stimulating Household Improvements Resulting in Economic Empowerment") reflecting the aim of providing households ways out of extreme poverty.

In order to monitor and evaluate socio-economic, empowerment and nutritional change, longitudinal (panel) surveys are being conducted (seasonally and annually) on randomly selected households. Besides these surveys, SHIREE is also supporting qualitative studies which will focus on key livelihood aspects of extreme poverty. The qualitative studies will provide rich longitudinal data which will be used with the surveys to gain more rounded insights into the choices and constraints facing extreme poor households.

This report provides information on the changes in socio-demographic and economic characteristics of households (including household assets, income and expenditure and social empowerment) and the nutritional status of parents and their < 5 year old children between March 2010 and March 2011. .

**shiree** is working with 6 NGOs. 2 NGOs (CARE and PAB) are working in the far north-west of Bangladesh, NETZ in the north-west, DSK in two urban slums in Dhaka and SCF and UTTARAN in the south-west (Table 1). The total number of households that the 6 NGOs are working with is 82,850..

Table 1 Location of the 6 NGOs and number of households

NGO	Location	Number of Households
CARE	Gaibandha, Nilphamari, Rangpur, Lalmonirhat	20,000
DSK	Dhaka slums	10,000
NETZ	Naogaon	9,000
PAB	Gaibandha, Nilphamari, Rangpur, Lalmonirhat	16,850
SCF (UK)	Khulna, Bagerhat	15,000
UTTARAN	Satkira, Khulna	12,000

## 2. AIMS OF THE ANNUAL SURVEYS

Through the annual surveys the project aims to determine:-

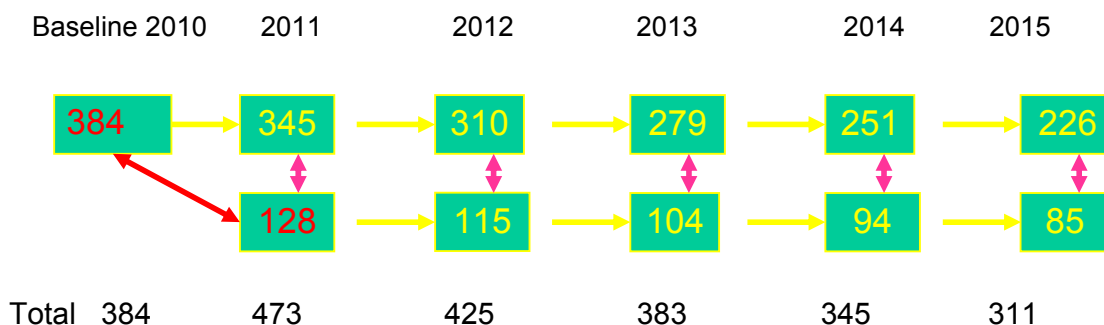
- (a) household annual change in socio-economic and empowerment status as a result of the shiree programme
- (b) intra-individual (primarily mother and <5 year old children) annual change in nutritional status
- (c) differences in nutritional, socio-economic status and empowerment between new and old recruits within the same NGO, and in the longer term
- (d) differences in nutrition, socio-economic status and empowerment between participants from different NGOs
- (e) differences between rural and urban cohorts

## 3. STUDY DESIGN

A longitudinal (panel) study design is being used (Figure 1) in which 384 households, 64 households from each NGO, were randomly recruited in March 2010 and a further 128 households were recruited in March 2011 (64 urban households and 64 rural households from NETZ).

The longitudinal design will examine (a) within subject changes (the yellow lines) (b) between cohort comparison of old and new cohort (purple lines) (c) recruitment homogeneity (red line) and (d) by year 3 for differences between NGOs.

Figure 1 Study Design



In March 2010, 64 representative households were selected from each of the 6 NGOs on the basis of the variables provided by the NGOs, usually the reported monthly income, educational level of the head of household, presence of under five year old in the household, age of the household head, household size and sex of household head. A representative back-up list was also generated in case households were absent on the day of the survey. A similar exercise was undertaken in the selection of the additional 128 households in March 2011.

#### **4. FIELD WORK**

The survey was completed in 24 days commencing on 8<sup>th</sup> March 2011 and finishing on 31<sup>st</sup> March 2011. A total of 24 people were involved in conducting the survey comprising 1 Researcher from Cambridge University, 1 Bengali Young Professional, 1 Programme Manager, 1 Data Manager, 6 Research Officers (but 1 absent later because of a health problem), 6 Research Assistants, 4 Enumerators and 4 Measurers.

A flexible survey team structure was used. Mainly 2 sub-teams were used, each team comprising 7 members (5 enumerators who were responsible for the questionnaire and 2 measurers who were responsible for taking anthropometric measurements and haemoglobin levels) with supervisors (Researcher, Young Professional, Research Officer, Programme Manager or Data Manager) to supervise the questionnaire and nutrition data collection. During the time the 5 enumerators were completing the questionnaires, the 2 measurers took the nutrition data in each household. In one day 16 households were visited by each team (32 households in total), hence it took 2 days usually to survey each NGO, except NETZ (3 days) and DSK (4 days) so as to complete an additional 32 households. The timetable allowed for some slippage as well as movement from 1 NGO to the next.

A trained Bengali enumerator asked a series of pre-tested questions to the head of household (or if the male head was absent, his spouse). The structured questionnaire covered 9 key areas:-

- a. socio-demographic characteristics
- b. disability, chronic illness and health status of all household members
- c. household land ownership
- d. housing size and structure, water, sanitation and electricity
- e. cash loans
- f. household assets
- g. household income and expenditure
- h. household food intake and food security
- i. gender and empowerment issues

The interview usually lasted about 1 hour.

At the same time the interviews were being carried out, the height, weight and haemoglobin levels of the mother and father (if available), and all children < 5 years of age were measured (some of follow-up children became more than 5 years of age). Height data were carefully checked with previous data in March 2010 by supervisors.

## 5. RESULTS

### 5.1 BASIC SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

In total 336 household participated in the four surveys (March 2010, July 2010, October 2010 and March 2011, called surveys 1 to 4, respectively) from the initial sample of 384 households. There was significant differential attrition across NGOs (Table 2,  $p=0.02$ ) with greatest loss in DSK (25%) and least in UTTARAN, (6%) but there was no significant difference in attrition rate between the five rural NGOs. Between the baseline survey and survey 4 there were thirty deaths and eleven births while fifteen adults and six children 5 to 15 years of age joined. Two households dropped out due to death, three refused to participate, ten households had left the area permanently, and fourteen were temporarily absent on the day of the survey. Information was collected on 1169 individuals, 679 adults, 334 children five to fifteen years old and 156 children under 5 years of age.

Just over 40% of households had a female head (40.8%) compared with 10.2% nationally (Household Income and Expenditure Survey, HIES, 2005) but there was highly significant variation between NGOs ( $p<0.001$ , Table 2) with most female headed households in DSK and NETZ and least in CARE. Female heads were primarily widowed (61.3%) or divorced/abandoned (19.7%) and only 18.2% were married while nearly all male heads were married (96.0%).

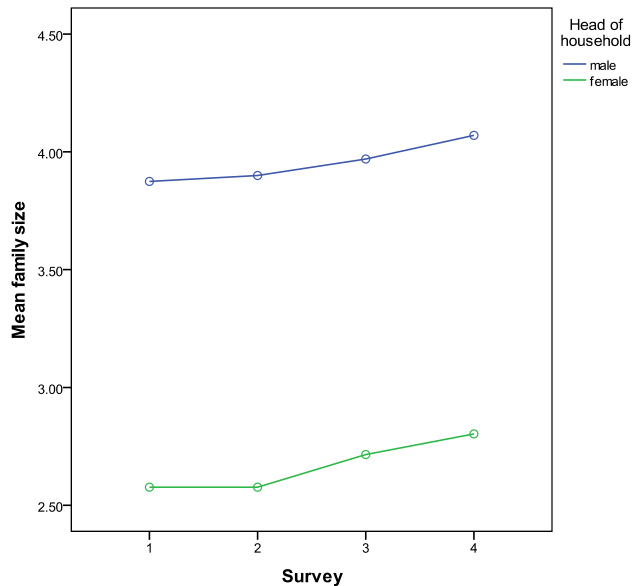
Table 2 Attrition (%) between surveys 1 and 4 by NGO and Female headed households (%) by NGO in survey 4

NGO	Attrition (%)	Female headed households (%)
CARE	14	14.5
DSK	25	64.6
NETZ	8	57.6
PAB	9	27.6
SCF	12	44.6
UTTARAN	6	38.3
Total Rural	9	36.8
Total	12.5	40.8

Repeated measures analysis of variance was used to examine the change in overall family size over the four surveys and as Figure 2 shows there was a small, but highly significant, increase in family size from survey 1 to survey 4 (mean family size, 3.23 in survey 1 and 3.48 survey 4 ( $p<0.001$ ) with male headed households having, on average 1.3 more family members (4.0 versus 2.7,  $p<0.001$ ).



Figure 2 Changes in mean family size over the four surveys



## 5.2 SCHOOLING

Only 21.4% of heads of households had attended school compared with 49% nationally (HIES, 2005) and male heads were more likely to attend school than female heads (28.6% and 10.9%, respectively,  $p < 0.001$ ). Of all adults about 30% had attended school more so in male (34%) than female headed households (25%,  $p < 0.001$ ).

There was a significant increase in school attendance between survey 1 and survey 4 in children 5 to 15 years of age. In survey 1, 77.9% of children attended school increasing to 85.7% in survey 4 ( $p < 0.001$ ).

## 5.3 DISABILITY AND CHRONIC ILLNESS WITHIN THE HOUSEHOLD

Overall 6% of heads of household were disabled mainly due to lack of mobility and vision. There was a small but insignificant reduction in disability between the baseline survey and survey 4 in all household member groups (Table 3). The vast majority of disabled adults and children reported difficulty with self care; in survey 4, 87% reported difficulty in washing and feeding, going to the toilet (80%) and dressing (82%).

The prevalence of reported chronic illness among household heads decreased significantly between baseline and survey 4 from 26.5% to 7.4% ( $p < 0.001$ ) and among all adults from 22.5% to 5.3% ( $p = 0.004$ ). There were also reductions in children and overall in all household members chronic illness fell from 14.8% to 3.4% ( $p < 0.001$ ).

Table 3 Prevalence of disability and chronic illness in surveys 1 and 4

Household member	Disability			Chronic Illness		
	Survey		p	Survey		p
	1	4		1	4	
Head	6.0	6.0	ns	26.5	7.5	<0.001
All adults	5.9	5.3	ns	22.5	5.3	0.004
Children 5-15	2.4	0.9	ns	4.5	0.9	ns
<5 children	1.9	1.3	ns	3.2	0.6	ns
Total	4.4	3.5	ns	14.8	3.4	<0.001

#### 5.4 MORBIDITY STATUS

The reported prevalence of morbidity was obtained at each survey. For household heads the main findings were of no significant changes in diarrhoea over the four surveys (Table 4). Eye infection and passing of worms both fell sharply between surveys 1 and 4. For all adults cough, eye infection and passing of worms all fell, and skin infection increased. In children 5 to 15 years of age the prevalence of fever and cough both fell between surveys 1 and 4. The only significant change in under 5 year old children was the reduction in passing of worms (Tables 5 to 7). For all family members together (Table 8) there were significant reductions in cough, fever and passing of worms on the day of the study, past 7 and 30 days between surveys 1 and 4 but even so about 30% of all family members reporting having a fever in the last 30 days and 20% had a cough.

Table 4 Morbidity status (%) of head of household over the four surveys

Condition	Day of survey						Previous 7 days						Previous 30 days					
	Survey				p	p (1&4)	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4			1	2	3	4		
Diarrhoea	1.5	3.3	4.5	2.1	ns	ns	8.9	10.2	12.6	12.5	ns	ns	19.6	21.3	23.7	21.4	ns	ns
Fever	7.4	13.5	11.4	7.4	0.019	ns	23.5	24.9	25.7	16.1	0.012	0.015	43.5	51.5	47.6	36.6	0.001	ns
Cough	21.7	9.9	18.9	13.1	<0.001	0.003	26.8	15.9	27.2	18.2	<0.001	0.007	38.1	28.4	37.1	28.9	0.007	0.011
Skin infection	8.6	11.4	19.8	12.5	<0.001	ns	8.6	13.5	20.7	12.5	<0.001	ns	8.9	13.5	21.6	12.8	<0.001	ns
Eye infection	20.8	4.2	4.2	4.2	<0.001	<0.001	22.6	4.2	5.7	5.4	<0.001	<0.001	23.2	6.0	15.9	6.3	<0.001	<0.001
Passed worms	14.9	1.2	3.6	0.3	<0.001	<0.001	17.6	4.8	7.5	1.5	<0.001	<0.001	21.1	11.4	10.8	4.2	<0.001	<0.001

Table 5 Morbidity status (%) of all family members on the day of the study over the four surveys

Condition	All adults						5-15 year old children						< 5 year old children					
	Survey				p	p (1&4)	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4			1	2	3	4		
Diarrhoea	2.0	3.0	3.2	2.0	ns	ns	0.6	0.3	2.2	0.9	ns	ns	3.6	6.0	7.0	3.3	ns	ns
Fever	7.7	11.0	11.4	7.7	0.025	ns	8.6	6.5	4.7	3.7	0.042	0.009	10.8	9.7	7.0	13.0	ns	ns
Cough	16.0	8.4	16.8	11.3	<0.001	0.012	9.3	6.2	8.2	4.0	0.047	0.008	16.5	9.0	14.1	12.4	ns	ns
Skin infection	7.0	8.8	16.1	9.0	<0.001	ns	3.7	2.2	4.7	5.6	ns	ns	5.0	5.2	10.6	5.3	ns	ns
Eye infection	16.9	3.0	3.3	3.5	<0.001	<0.001	0.3	0	0.3	0.6	ns	ns	1.4	1.5	0	1.3	ns	ns
Passed worms	14.7	1.2	2.6	0.3	<0.001	<0.001	19.4	1.5	2.8	0	<0.001	<0.001	19.4	1.5	3.5	1.3	<0.001	<0.001

Table 6 Morbidity status (%) of all family members in the previous 7 days over the four surveys

Condition	All adults						5-15 year old children						< 5 year old children					
	Survey				p	p (1&4)	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4			1	2	3	4		
Diarrhoea	8.2	8.2	10.3	9.2	ns	ns	3.1	7.2	8.8	7.2	0.024	0.017	10.8	6.3	9.6	5.8	ns	ns
Fever	19.8	21.5	24.5	18.8	ns	ns	17.6	18.5	13.2	12.1	0.045	0.036	25.9	25.9	26.7	24.0	ns	ns
Cough	20.1	11.9	24.1	15.8	<0.001	0.040	13.0	4.6	8.5	7.2	0.001	0.014	25.9	14.9	18.5	20.9	ns	ns
Skin infection	7.0	10.2	16.2	9.0	<0.001	ns	4.0	2.2	5.0	5.6	ns	ns	4.3	5.9	10.4	6.5	ns	ns
Eye infection	18.3	3.3	5.5	4.5	<0.001	<0.001	0.6	0	3.1	1.3	0.002*	ns	2.2	3.7	3.7	1.3	ns	ns
Passed worms	18.6	5.0	7.0	1.5	<0.001	<0.001	21.3	3.7	6.6	1.6	<0.001	<0.001	19.4	12.7	12.6	6.5	0.011	0.001

Table 7 Morbidity status (%) of all family members in the previous 30 days over the four surveys

Condition	All adults						5-15 year old children						< 5 year old children					
	Survey				p	p (1&4)	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4			1	2	3	4		
Diarrhoea	16.0	17.5	20.3	17.6	ns	ns	9.0	11.1	14.5	9.1	ns	ns	10.8	11.9	9.6	5.8	ns	ns
Fever	38.9	44.0	44.4	32.5*	<0.001	0.015	32.4	43.0	31.8	20.9	<0.001	0.001	48.2	63.4	40.0	41.6	<0.001	ns
Cough	29.7	23.3	33.5	24.2	<0.001	0.026	19.4	20.1	20.4	11.8	0.012	0.008	38.1	33.6	33.6	27.4	ns	ns
Skin infection	7.1	10.5	17.1	9.2	<0.001	ns	4.0	2.2	6.3	5.6	ns	ns	5.8	6.0	11.9	6.5	ns	ns
Eye infection	18.6	5.0	14.4	5.1	<0.001	<0.001	1.2	0.3	13.8	1.9	<0.001	ns	2.2	4.5	8.1	1.3	0.015	ns
Passed worms	20.3	10.8	9.1	3.6	<0.001	<0.001	22.5	10.8	8.8	4.4	<0.001	<0.001	23.0	21.6	19.3	12.4	ns	0.017

Table 8 Morbidity status (%) of all family members together on the day, previous 7 and 30 days over the four surveys

Condition	Day of survey						Previous 7 days						Previous 30 days					
	Survey				p	p (1&4)	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4			1	2	3	4		
Diarrhoea	1.8	2.6	3.4	1.8	0.042	ns	7.0	8.4	9.8	8.2	ns	ns	13.3	15.0	15.9	13.6	ns	ns
Fever	8.4	9.5	8.9	7.3	ns	ns	19.9	21.1	21.6	17.5	ns	ns	38.2	46.1	40.3	30.4	<0.001	<0.001
Cough	14.1	7.8	14.0	9.4	<0.001	<0.001	18.8	10.1	19.0	15.8	<0.001	0.002	27.8	23.6	29.8	21.1	<0.001	<0.001
Skin infection	5.8	6.5	12.1	7.6	<0.001	ns	5.8	7.3	12.3	7.7	<0.001	ns	6.0	7.5	13.4	7.8	<0.001	ns
Eye infection	10.2	2.0	2.1	2.4	<0.001	<0.001	11.2	2.4	4.6	2.6	<0.001	<0.001	11.6	3.6	13.5	3.7	<0.001	<0.001
Passed worms	16.6	1.3	2.8	0.4	<0.001	<0.001	19.5	5.6	7.5	2.2	<0.001	<0.001	21.3	12.0	10.2	5.0	<0.001	<0.001

## 5.5 EMPLOYMENT

There were significant changes in the main occupation of male headed households across all four surveys and between surveys 1 and 4 (Table 9). Unemployment fell to zero and petty trading increased substantially in both male and female headed households. Begging still remained an important source of income in female headed households.

Information on self employment was only ascertained in surveys 2, 3 and 4. In male headed households there was an increase in self employment in the total sample from surveys 2 to 4 and close to 50% of male headed householders were self employed in survey 4 although there was considerable variation between NGOs (Table 10). In female headed households there was a fall in self employment between surveys 2 and 4.

Information on the number of days worked in the last 7, 14 and 30 days and hours worked in the last 7 days was only collected in surveys 3 and 4. There was a highly significant increase in the days and hours worked between surveys 3 and 4. Male heads worked less days than female heads but the gap fell between surveys 3 and 4 (Table 11). Urban dwellers worked more than rural householders but the gap between urban and rural dwellers fell significantly between the two surveys. The self employed worked more days. Questions on advanced sale of labour were only asked in surveys 3 and 4 (Table 12). The analyses showed that the percentage paid in advance fell from 3% to under 1% but the difference was not significant.

Table 9 Main occupation (%) of head of households over the four surveys

Occupation	Male					Female						
	Survey				p	p (1&4)	Survey				p	p (1&4)
	1	2	3	4			1	2	3	4		
Unemployment	5.4	2.5	1.0	0	0.007	0.001	6.1	3.2	2.2	0	ns	ns
Agricultural day labourer	35.1	28.8	27.5	28.7			15.3	13.7	19.1	20.0		
Other day labourer	20.0	19.2	12.0	12.2			9.2	12.9	9.6	10.0		
Domestic maid	0.5	1.0	1.0	0.5			31.3	25.0	22.1	23.8		
Rickshaw	16.1	19.2	18.5	19.1			0	0	0	0		
Skilled labour	4.4	3.0	6.0	5.3			0.8	0.8	1.5	1.5		
Fishing/aquaculture	4.9	9.6	6.5	5.9			2.3	4.0	2.9	3.1		
Livestock	0	0.5	1.0	1.1			0	2.4	2.9	3.1		
Cottage/garment	1.5	2.0	6.0	6.4			1.5	2.4	2.9	2.3		
Petty trade	8.8	11.1	16.5	17.6			11.5	12.9	16.2	16.2		
Begging/scavenging	3.4	3.0	3.0	2.1			16.8	12.1	11.8	11.5		
Housework	0	0	1.0	1.1			5.3	10.5	8.8	8.5		

Table 10 Self-employed heads of households (%) by NGO over surveys 2 to 4

NGO	Male				Female				Total			
	Survey			p	Survey			p	Survey			p
	2	3	4		2	3	4		2	3	4	
CARE	36.2	40.4	50.0	ns	50.0	37.5	37.5	ns	38.2	40.0	48.1	ns
DSK	52.6	61.1	52.6	ns	69.0	69.0	64.3	ns	62.5	66.0	59.6	ns
NETZ	3.8	11.5	23.1	ns	51.5	60.6	36.4	ns	30.5	39.0	30.5	ns
PAB	38.1	31.0	30.0	ns	25.0	43.8	25.0	ns	34.5	34.5	28.6	ns
SCF	61.3	64.5	64.3	ns	60.0	68.0	65.2	ns	60.7	66.1	64.7	ns
UTTARAN	40.5	48.6	66.7	ns	27.3	54.5	28.6	ns	35.6	50.8	52.6	ns
Total	38.6	41.8	47.7	ns	49.6	59.4	45.0	0.042	43.0	48.8	46.6	ns

Table 11 Mean number of days and hours worked by head of household, urban-rural and type of employment in surveys 3 and 4

Number of days worked	Overall			Male			Urban			Self*			
	Survey		p	Survey		p	Survey		p	Survey	p	Survey	p
	3	4		3	4		3	4		3		4	
In the last 7 days	3.53	4.35	<0.001	-0.62	-0.21	ns	1.62	0.66	<0.001	1.87	<0.001	1.19	<0.001
In the last 14 days	7.11	8.69	<0.001	-1.54	-0.48	0.019	3.45	1.43	<0.001	3.73	<0.001	2.09	<0.001
In the last 30 days	14.58	18.38	<0.001	-2.36	-0.63	ns	5.59	2.63	0.001	7.40	<0.001	4.70	<0.001
Hours worked in the last 7 days	5.35	6.38	<0.001	+0.69	+0.93	0.017	2.34	0.32	0.004	1.25	0.006	0.04	ns

\*Independent sample t-test was performed to compare mean working day (or hours) between self vs non-self employment.

Table 12 Advanced sale of labour (%) in surveys 3 and 4

Advanced sale of labour	Last 7 days			Last 14 days			Last 30 days			Last 3 months		
	Survey		p	Survey		p	Survey		p	Survey		p
	3	4		3	4		3	4		3	4	
%	3.0	0.6	0.024	3.0	0.9	ns	3.0	0.9	ns	1.5	0.3	ns
Range (days)	0-7	0-7		0-14	0-14		1-30	1-19		0-18	0-2	

## 5.6 HOUSEHOLD LAND OWNERSHIP

The percentage of households owning land increased significantly from 14.6% in survey 1 to 28.3% in survey 4 ( $p < 0.001$ ) in the total sample (94.7% own land nationally, HIES, 2005) and also in male headed households (18.1% and 35.7%,  $p < 0.001$ ) but not female headed households (9.5% and 17.5%, Table 13). Use of cultivated land did not show any significant change but both share cropping and use of free cultivated land increased significantly overall and in male headed households between surveys 1 and 4.

Table 13 Household land ownership by head of household in surveys 1 and 4

Land	Male			Female			Total		
	Survey		p	Survey		p	Survey		p
	1	4		1	4		1	4	
Land owned			<0.001			ns			<0.001
0	81.9	64.3		90.5	82.5		85.4	71.7	
0.1-2.49	8.0	16.6		4.4	8.0		6.5	13.1	
2.50-4.99	4.5	8.5		3.6	4.4		4.2	6.8	
5.0+	5.5	10.6		1.5	5.1		3.9	8.3	
Cultivated – yes	2.0	2.0	ns	0	0.7	ns	1.2	1.5	ns
Share cropped – yes	4.0	8.5	0.035	0.7	2.9	ns	2.7	6.3	0.012
Free use – yes	4	10.1	0.012	0	3.6	ns	2.4	7.4	<0.001

## 5.7 HOUSING, WATER ACCESS, SANITATION AND ELECTRICITY

### 5.7.1 Home Ownership

The percentage of households owning their own house increased from 70% to 77.4% ( $p = 0.03$ , Table 14) between surveys 1 and 4.

House Ownership	Survey	
	1	4
Own	25.8	24.4
Rent	15.6	14.9
Live with parent	2.7	0.9
Live with parent-in-law	0.9	0.6
Rent free with family	5.4	4.2
Rent free non-family	5.4	2.1
Own house on khas land or someone else's land	44.1	53.0

### 5.7.2 Size of house

Each household specified the length and width of their house in hath (0.46m) and from this the total area of the house was determined in square metres (sq m). The mean reported size of houses increased significantly from 13.9sq m to 15.3sq m between 2010 and 2011 ( $p = 0.003$ ), but this increase was only apparent in male headed households (up from 15.3 to 17.5sq m, 2010 and 2011 respectively,  $p < 0.001$ ) and not in female headed households (11.8 and 12.1sq m, respectively,  $p$  ns). The smallest dwellings continued to be, on average, in the urban slums (8.6sq m) and largest, on average, CARE households (19.0sq m).



### 5.7.3. House construction

There was no significant change in house construction between surveys 1 and 4 (Table 15).

Table 15 Materials use in construction of wall, roof and floor in surveys 1 and 4

Material	Wall		Roof		Floor	
	Survey		Survey		Survey	
	1	4	1	4	1	4
None	-	0.3	0.3	0.3	-	-
Grass etc.	27.9	28.9	22.5	19.3	0.6	3.9
Bamboo	18.3	11.9	0.6	0.6	5.1	-
Mud	26.4	26.8	0.9	-	85.4	86.6
Tiles	0.3	-	2.7	4.5	-	-
Tin sheet	26.1	30.7	71.7	75.0	-	0.3
Cement/brick	0.9	1.5	0.6	0.3	8.0	9.2

### 5.7.4 Source of drinking water

There was no significant change in the source of drinking water between surveys 1 and 4 (Table 16).

Table 16 Source of drinking water

Material	Wall	
	Survey	
	1	4
Pipe	10.4	11.3
Tubewell	74.1	76.2
Open well	0.6	0.9
Pond/river	14.3	11.6
Purchased	0.6	-

### 5.7.5 Electricity supply

There was little change in electricity supply between surveys 1 and 4 and nearly all rural households (95%) had no electricity supply (nationally 68% of rural households do not have electricity) whereas about 86% of urban dwellers had an electrical supply which is very close to the national urban average of 88%.

### 5.7.6 Defecation practices

There were highly significant improvements in defecation practices in the rural sample as well as total sample (Table 17) with the main reduction in the use of open spaces and increased usage of ring/slab latrines.

Table 17 Defecation practices by urban/rural in surveys 1 and 4

Defecation practice	Urban			Rural			Total		
	Survey		p	Survey		p	Survey		p
	1	4		1	4		1	4	
Open	2.1	2.1	ns	36.8	20.5	<0.001	31.8	17.9	<0.001
Hanging	10.4	4.2		2.1	0.7		2.2	1.2	
Pit	12.5	2.1		10.8	8.7		11.0	7.7	
Ring/slab	39.6	39.6		49.3	68.4		47.9	64.3	
Sanitary	35.4	52.1		1.0	1.7		6.0	8.9	

## 5.8 CASH LOANS AND SAVINGS

### 5.8.1 Cash Loans

Five sources of cash loan were identified (i) free informal (ii) informal loans with interest (iii) interest loans from shomiti (iv) interest loans from microfinance institutions and (v) interest loans from bank or Government of Bangladesh. There was no consistent pattern as to the number or amount borrowed over the 4 surveys (Table 18) except that the mean loan per household was highest in survey 4 as were the number and amount of microfinance loans.

Table 18 Number of loans, average amount of loan over the 4 surveys

Survey	Type	Number	Household	Mean/loan	Mean/household
1	Free informal	96	61	1682	2647
	Interest informal	94	49	2447	4694
	Shomiti	8	8	3258	3258
	Microfinance	17	15	3902	4422
	Bank	8	7	5667	6476
	Total	223	140	2373	3780
2	Free informal	103	78	1553	2051
	Interest informal	37	35	2763	2921
	Shomiti	8	8	2975	2975
	Microfinance	28	25	3929	4401
	Bank	1	1	7770	7770
	Total	177	147	2281	2747
3	Free informal	132	89	1191	1766
	Interest informal	84	57	3674	3674
	Shomiti	9	8	3364	3784
	Microfinance	21	21	3716	3716
	Bank	1	1	16700	16700
	Total	247	176	1990	2836
4	Free informal	87	65	2040	2730
	Interest informal	81	57	4078	5797
	Shomiti	11	9	2510	3068
	Microfinance	33	31	4692	4994
	Bank	1	1	12000	12000
	Total	213	132	3297	5320

### 5.8.2 Cash Savings

The respondents were asked about the extent of their cash savings and as Table 19 shows for the total sample the number and amount of savings increased from survey 1 to survey 4 and by survey 4 all households had some cash savings. The increase in percentage between surveys (i.e. survey 1 to 2, 2 to 3 and 3 to 4) were all highly significant ( $p < 0.001$ ) for the total sample as well as in the rural sample, but the mean savings did not change significantly between sequential surveys (i.e. survey 1 to 2, 2 to 3 and 3 to 4) although the change between survey 1 and survey 4 was very significant ( $p < 0.001$ ). There were significant differences in NGO mean savings in all surveys but particularly marked from survey 2 onwards due to the much higher savings in DSK. The increase in savings was not consistent across NGOs, for example savings in PAB fell from surveys 2 to 4 while in CARE they increased from survey 2 to 4. When analyses were restricted to the rural NGOs there was no significant difference in means in survey 1 but thereafter highly significant differences in means were apparent. There was no significant difference in mean cash savings between male and female headed households for all four surveys.

Table 19 Cash savings by NGO over the 4 surveys

NGO	Survey							
	1		2		3		4	
	n	Mean	n	Mean	n	Mean	n	Mean
CARE	35	512	36	416	46	605	55	817
DSK	41	264	44	1774	48	2352	48	2375
NETZ	18	82	40	239	56	694	59	577
PAB	22	945	21	1690	24	1330	58	649
SCF	4	655	22	542	25	1109	56	901
UTTARAN	4	347	48	230	57	276	60	1491
Total Rural	83	533	167	497	208	683	288	891
Rural %	29		58		72		100	
Total	124	444	211	763	256	996	336	1103
Total %	37		63		76		100	

## 5.9 HOUSEHOLD ASSETS

### 5.9.1 Animals

Only one urban household owned an animal (chicken) in both March 2010 and 2011. There were highly significant increases in animal ownership in both male and female headed households, particularly for cattle, goat and poultry (Table 20). Animal ownership in both male and female headed households was very similar in March 2011 at just over 60% and overall animal ownership increased by 33.9% between surveys 1 and 4. Ownership increased in all rural NGOs (Table 21) but there was no significant increase in male headed households in UTTARAN between surveys. In March 2011 information on shared ownership was also collected and just under 10% of rural households

shared animals, primarily cattle and calves. In total 62.8% of rural households either owned or shared an animal in survey 4 (Table 20).

There were highly significant increases in the amount spent on purchasing animals between the two surveys in both male and female headed households. Overall there was a fivefold increase in spending on animals (Table 25). In March 2011 female headed households had spent significantly more on animals than male headed households (8125 Taka versus 5654 Taka, respectively,  $p < 0.025$ ).

#### 5.9.2 Working equipment

There were significant increases in working equipment ownership in both male and female headed households particularly on rickshaws, and in male headed households on nets and agricultural equipment (Table 20). Overall nearly three quarters of households owned some working equipment in March 2011 compared with just over half in March 2010. Over 80% of male headed households owned some working equipment in survey 4 compared with only 57% of female headed households ( $p < 0.001$ ). The total amount spent on working equipment increased by over 1500 Taka (340% increase) between surveys 1 and 4 (Table 25).

#### 5.9.3 Household belongings

There was increased ownership of all household items between the two surveys with the exception of blankets/quilts and there were large increases in ownership of a mobile phone, fan, wardrobe and chair (Table 24). Nearly a fifth of households had a permanent or temporary shop in survey 4.

Male household belongings were worth significantly more than female headed households in both March 2010 ( $p < 0.01$ ) and March 2011 ( $p < 0.025$ ). Inclusion of shop assets increased the value of household belongings by over 1000 Taka in male headed households ( $p < 0.01$ ) and by over 600 Taka in female headed households ( $p < 0.025$ ).

#### 5.9.4 Total household assets

Total assets (excluding shop) increased substantially in both male and female headed households to about 9000 Taka ( $p$  ns, Table 25). With the inclusion of shop male headed households mean assets were just over 10,000 Taka about 500 Taka more than female headed households ( $p$  ns). There was considerable variation between NGOs (Table 26) with NETZ and UTTARAN spending the most in survey 4. The average amount spent did not vary significantly between rural and urban households (9146 versus 8308 Taka, respectively).

Part of the increase in assets will have resulted from direct transfer from shiree. Information on the worth of assets transferred was collected in surveys 2 and 3 and the mean amount was 6443 Taka, but there was considerable variation between NGOs from a mean of 921 Taka per household in CARE to 17410 per household in NETZ. When total worth of assets transferred by shiree was subtracted from total worth of assets in survey 4, overall households were in credit by about 2500 Taka, but there was considerable

variation between NGOs with deficits averaging 4200 and 1800 Taka in NETZ and DSK, respectively, and credit in the other 4 NGOs ranging from just over 3100 Taka in PASB to over 7600 Taka in UTTARAN.

Table 20 Ownership (%) of specific animals in surveys 1 and 4

Animal ownership	Male			Female			Total			Shared ownership		
	Survey		p	Survey		p	Survey		p	Male	Female	Total
	1	4		1	4		1	4				
Cattle	3.0	12.6	<0.001	0.7	27.0	<0.001	2.1	18.5	<0.001	8.0	2.9	6.0
Calf	0.5	3.0	ns	0.7	3.6	ns	0.6	3.3	0.02	0.5	0.7	0.6
Goat	7.0	23.6	<0.001	3.6	24.8	<0.001	5.7	24.1	<0.001	3.5	2.9	3.3
Poultry	27.1	44.2	<0.001	13.9	3.6	<0.001	21.7	39.9	<0.001	-	0.7	0.3
Pig	0.5	2.5	ns	0.7	2.2	ns	0.6	2.4	ns	-	-	-
Total	34.2	60.8	<0.001	17.5	62.0	<0.001	27.4	61.3	<0.001	12.1	5.8	9.5

Table 21 Ownership (%) of any animal by NGO and head of household in surveys 1 and 4

NGO	Male		Female		Total	
	Survey		Survey		Survey	
	1	4	1	4	1	4
CARE	38.3	57.4	37.5	37.5	39.2	55.5
DSK	-	5.9	3.2	-	2.1	2.1
NETZ	32.0	78.0	26.5	100.0	29.8	94.9
PAB	31.0	54.8	-	62.5	22.4	56.9
SCF	25.8	83.9	36.0	84.0	30.4	83.9
UTTARAN	56.8	59.5	8.3	73.9	38.3	65.0
Total Rural	37.4	65.9	21.7	80.2	31.6	71.2
Total	34.2	60.8	17.5	62.0	27.4	61.3

Table 22 Ownership (%) of specific working equipment in surveys 1 and 4

Working Equipment Ownership	Male			Female			Total		
	Survey		p	Survey		p	Survey		p
	1	4		1	4		1	4	
Net	13.1	21.1	0.009	4.4	10.2	ns	9.5	16.7	<0.001
Rickshaw	5.5	18.6	<0.001	2.2	10.9	0.004	4.2	15.5	<0.001
Boat	0.5	2.0	ns	1.5	1.5	ns	0.9	1.8	ns
Sewing Machine	-	3.5	ns	0.7	4.4	ns	0.3	3.9	ns
Cottage industry	0.5	1.0	ns	-	1.5	ns	0.3	1.2	ns
Agricultural equipment	12.1	11.6	<0.001	19.0	13.1	ns	14.9	12.2	<0.001
2	19.6	20.1		13.9	16.8		17.3	18.8	
3+	22.6	46.7		8.8	16.8		17.0	34.5	
Total	62.8	84.4	<0.001	44.5	56.9	0.017	55.4	73.2	<0.001

Table 23 Ownership (%) of any working equipment by NGO and head of household in surveys 1 and 4

NGO	Male		Female		Total	
	Survey		Survey		Survey	
	1	4	1	4	1	4
CARE	61.7	89.4	25.0	37.5	56.4	81.8
DSK	17.6	47.1	22.6	25.8	20.8	33.3
NETZ	96.0	88.0	55.9	67.6	22.9	76.3
PAB	64.3	85.7	50.0	43.8	60.3	74.1
SCF	58.1	77.4	48.0	76.0	53.6	76.8
UTTARAN	64.9	97.3	56.5	78.3	61.7	90.0
Total Rural	67.0	87.9	50.9	66.0	61.1	79.9
Total	62.8	84.4	44.5	56.9	55.4	73.2

Table 24 Ownership (%) of specific household belongings (%) by head of household in surveys 1 and 4

Household belongings	Male			Female			Total		
	Survey		p	Survey		p	Survey		p
	1	4		1	4		1	4	
Television	0.5	3.5	0.031	1.5	7.3	0.021	0.9	5.1	0.001
Radio	1.0	4.5	ns	0.7	2.2	ns	0.9	3.6	0.035
Mobile phone	6.0	23.1	<0.001	1.5	13.9	<0.001	4.2	19.3	<0.001
Bicycle	5.0	11.6	0.002	0.7	2.9	ns	3.3	8.0	<0.001
Fan	7.0	10.6	0.039	10.2	17.5	0.006	8.3	13.4	<0.001
Jewellery	59.8	63.3	ns	32.1	32.1	ns	48.5	50.6	ns
Wooden box	39.2	51.3	0.002	28.5	37.2	ns	34.8	45.5	<0.001
Blanket	97.5	94.9	ns	94.9	94.9	ns	96.4	94.9	ns
Table	28.6	36.2	0.04	10.9	12.4	ns	21.4	26.5	0.040
Wardrobe	5.0	15.1	<0.001	5.1	12.4	0.013	5.1	14.0	<0.001
Chair	20.6	37.2	<0.001	6.6	14.6	0.019	14.9	28.0	<0.001
Mattress	17.1	23.1	ns	8.8	13.1	ns	13.7	19.0	<0.001
Bed	70.4	82.9	<0.001	59.2	64.2	ns	66.1	75.3	<0.001
Permanent shop		19.1			14.6			17.3	
Temporary shop		19.6			16.8			18.5	



Table 25 Average amount (Taka) spent on assets by head of household in surveys 1 and 4

Assets	Male			Female			Total		
	Survey		p	Survey		p	Survey		p
	1	4		1	4		1	4	
Animals	1276	5654	<0.001	1141	8125	<0.001	1241	6666	<0.001
Equipment	558	2048	<0.001	249	1916	<0.001	456	2006	<0.001
Household belongings	1965	3919	<0.001	1321	2833	<0.001	1703	3476	<0.001
Household belongings + shop		4941			3475			4347	
Total assets	2752	9085	<0.001	1633	8906	<0.001	2296	9012	<0.001
Total assets + shop		10108			9548			9880	

Table 26 Average amount (Taka) spent on assets by NGO and head of household in surveys 1 and 4

NGO	Male		Female		Total	
	Survey		Survey		Survey	
	1	4	1	4	1	4
CARE	2860	5385	1079	2112	2601	4909
DSK	2754	11064	2554	6642	2625	8208
NETZ	1168	12470	1048	13739	1099	13201
PAB	3796	5935	1496	7057	3162	6245
SCF	2359	10868	1919	8210	2163	9681
UTTARAN	2828	12672	1230	9216	2215	11347
Total Rural	2752	8901	1363	9568	2241	9146
Total	2752	9085	1633	8906	2295	9012

## 5.10 HOUSEHOLD INCOME

Repeated measures analysis of variance was used to examine the changes in income (based on HIES criteria) over the four surveys by both head of household and by NGO. Overall the mean income increased from 1702 in survey 1 to 1876, 2037 and 2791 Taka/month from surveys 2 to 4 respectively. As can be seen in Figure 3 there was a consistently higher mean income in male headed households (overall average of the four surveys, 2709 versus 1494 Taka/month in male and female headed households, respectively). Part of the increase in mean income is due to the much higher income in the urban area (average of the four surveys, 4515 Taka/month) compared with rural areas (average of the four surveys, 1619 Taka/month, Table 27, Figure 4).

The analyses were repeated just for the five rural NGOs and no significant change in mean income was found until survey 4 (1446, 1446, 1382, 2203 Taka/month for surveys 1 to 4, respectively) and the pattern of change among the NGOs was inconsistent ( $p < 0.001$ ) i.e. the lines were not parallel. When the mean income over the four surveys was averaged there was no significant difference in mean income between the five rural NGOs. Rural male headed households reported income was over 1200 Taka/month more than female headed households (2236 versus 1002 Taka/month) respectively.

The mean per capita income for the total sample was significantly higher in male than female headed households (22.2 and 19.4 Taka pppd, respectively,  $p < 0.001$ ) and the difference was consistent over the four surveys (Figure 5). Per capita income over the four surveys revealed that the mean Taka pppd in the urban areas was more than double that in the rural areas (40.8 versus 17.4) Taka pppd, Table 27 and Figure 6). There was an upward trend in per capita income in the urban area but in the rural areas there was a small fall over the first three surveys and only in survey four did the mean per capita income significantly improve (means of 16.5, 16.4 15.2 and 21.6, overall average of the four surveys, 1 to 4, respectively).

In the rural areas alone there was no significant difference in per capita income between the five NGOs overall (i.e. average of the four surveys), but there was highly significant heterogeneity in the pattern of means between NGOs ( $p < 0.001$ , i.e. non-parallel lines) and rural male headed households earned on average 4.9 Taka pppd (19.9 versus 15.0 Taka pppd, in male and female headed households, respectively). Based on 22 Taka pppd (2007 prices) the percentage of rural households below the threshold remained stable for surveys 1 to 3 at about 70% (Table 28 p ns), but there was a significant fall in survey 4 to just under 50% ( $p < 0.001$ ). With a 26 Taka pppd (2009 prices) threshold about 80% of households were below the threshold for surveys 1 to 3 falling to 62% in survey 4 ( $p < 0.001$ ). In the urban areas over 50% of households were below the 26 Taka pppd (2007 prices) in survey 1 falling to under 30% in surveys 2 and 3 and to 18.8% by survey 4 ( $p < 0.001$ ). With a 30 Taka pppd threshold, 62.5% were below the threshold in survey 1 falling to over 30% in surveys 2 and just over 20% in survey 4.

Female headed households had significantly greater in-kind income than male headed households (514 versus 287 Taka, respectively, Figure 7). In-kind

income also increased significantly especially between surveys 2 and 3 (303, 341, 483 and 476 Taka, respectively from survey 1 to survey 4,  $p=0.022$ ) but there was no significant heterogeneity between NGOs (mean 401 Taka, Figure 8). The percentage that in-kind income contributed to total income in the total sample rose from 17% in survey 1 to 22% in survey 3 and then fell back to 19% in survey 4. DSK had the lowest percentage throughout the four surveys (8%) while NETZ had the highest (27%, Table 29).

Table 27 Mean income (Taka) based on the average of the four surveys by NGO

NGO	Cash income/month	Per capita income	In-kind income/month	Total income/month
CARE	1749	20.6	471	2220
DSK	4515	40.8	454	4969
NETZ	1428	15.8	378	1806
PAB	1491	16.8	402	1893
SCF	1596	15.5	303	1899
UTTARAN	1829	18.5	395	2224
Total Rural	1619	17.4	390	2008
Total	2101	21.3	401	2502

Table 28 Percentage of households below per capita income (Taka pppd) thresholds over the four surveys

	<22 Taka pppd				<26 Taka pppd			
	Survey				Survey			
Rural	1	2	3	4	1	2	3	4
CARE	54.5	54.5	78.2	38.2	67.3	69.1	85.5	47.3
NETZ	71.2	79.7	83.1	54.2	81.4	84.7	88.1	69.5
PAB	53.4	69.0	82.8	58.6	65.5	81.0	87.9	72.4
SCF	83.9	81.8	67.9	60.7	91.1	89.1	78.6	69.6
UTTARAN	81.7	64.4	76.7	36.7	86.7	78.0	78.3	51.7
Total Rural	69.1	69.9	77.8	49.7	78.5	80.4	83.7	62.2
	<26 Taka pppd				<30 Taka pppd			
Urban	1	2	3	4	1	2	3	4
DSK	52.1	27.1	29.2	18.8	62.5	35.4	31.3	20.8

Table 29 In-kind income as a percentage of total income by NGO over the four surveys

NGO	Survey			
	1	2	3	4
CARE	17	16	19	14
DSK	8	5	9	10
NETZ	17	31	35	24
PAB	16	23	29	24
SCF	24	11	19	22
UTTARAN	22	22	19	18
Total	17	18	22	19
Rural	19	18	22	19

Figure 3 Mean income by head of household over the four surveys

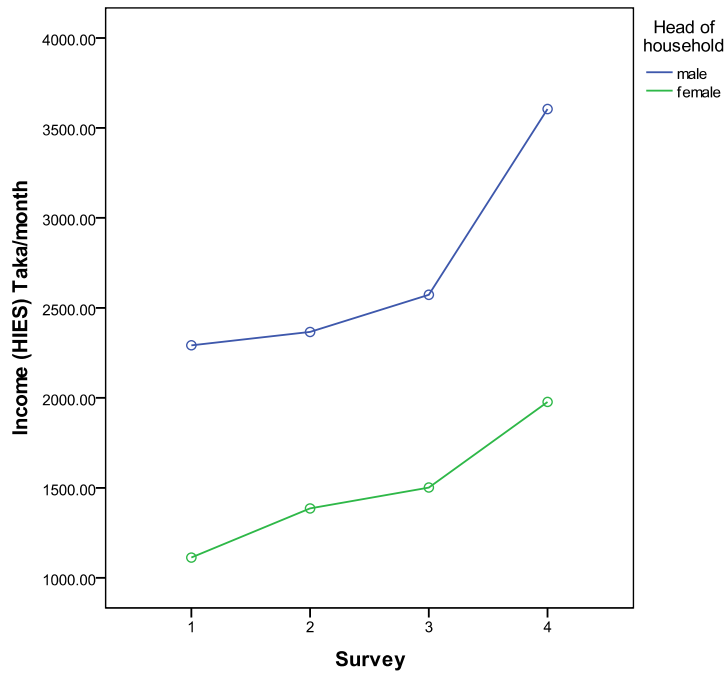


Figure 4 Mean income by NGO over the four surveys

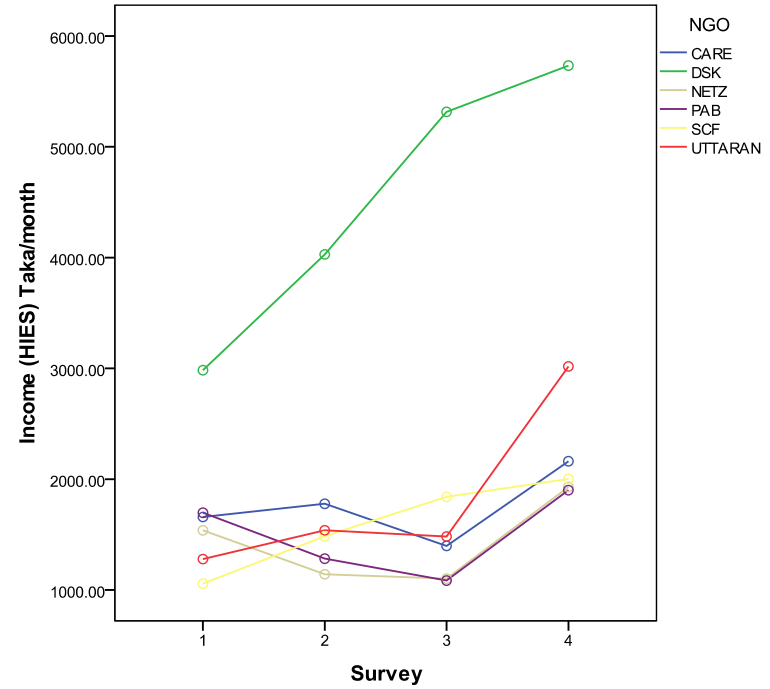


Figure 5 Mean income pppd by head of household over the four surveys

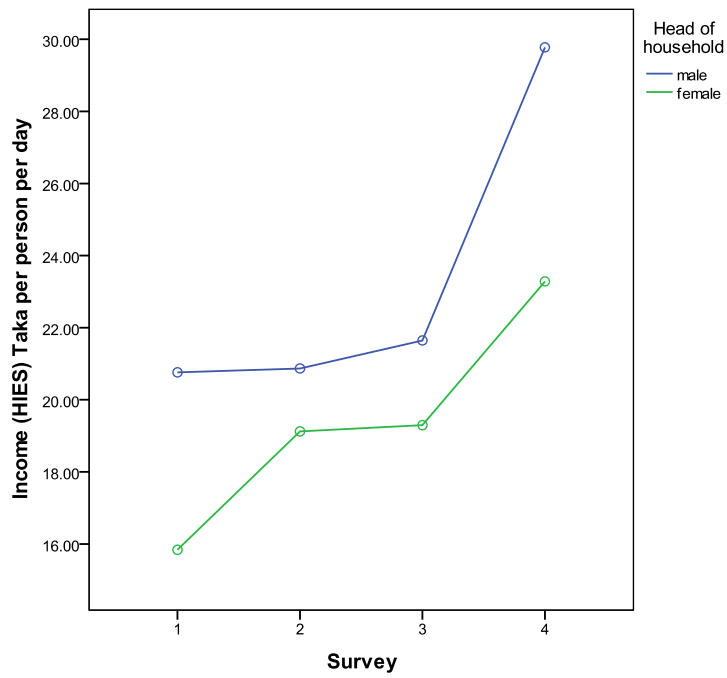


Figure 6 Mean income pppd by NGO over the four surveys

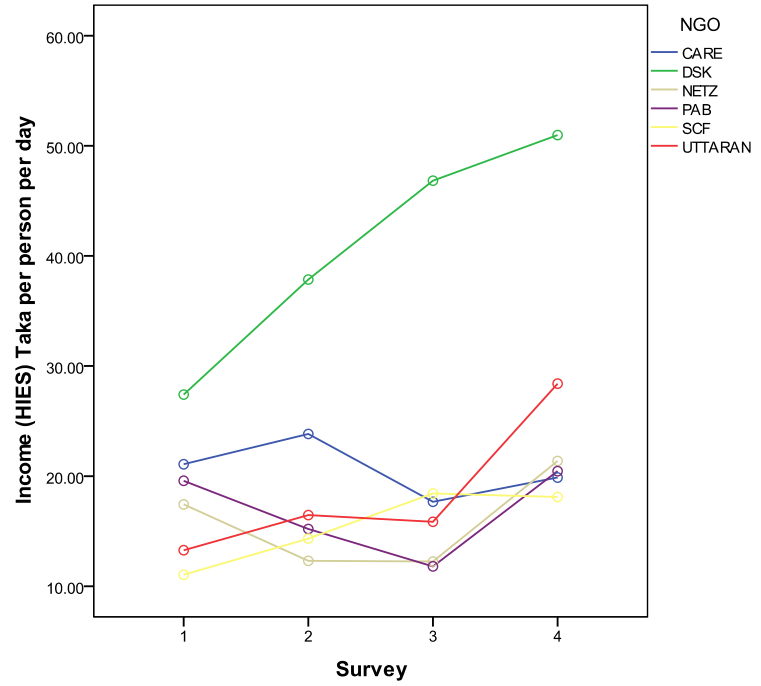


Figure 7 Mean in-kind income by head of household over the four surveys

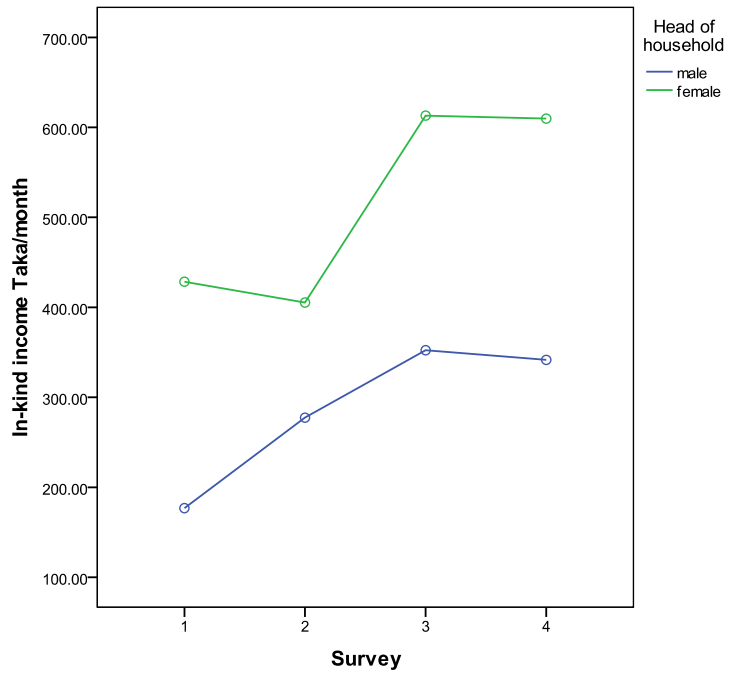
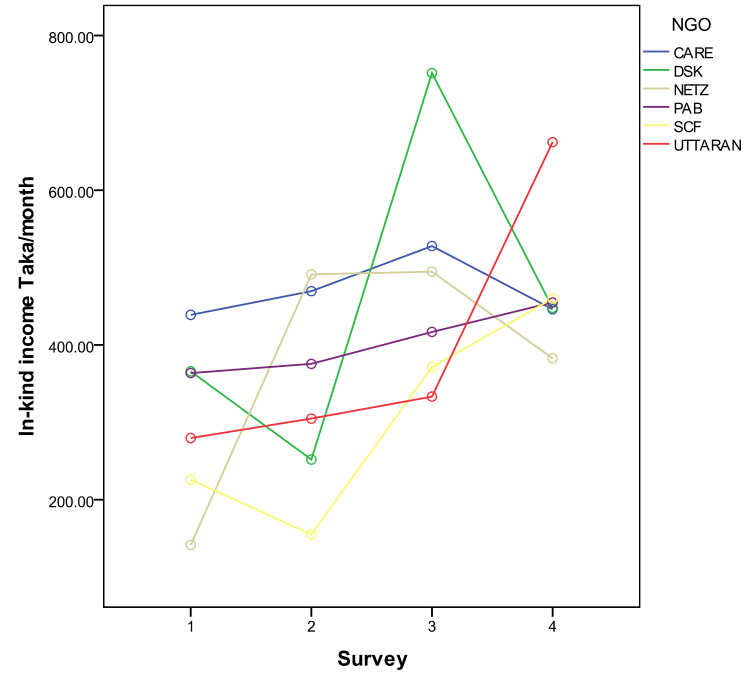


Figure 8 Mean in-kind income by NGO over the four surveys



## 5.11 HOUSEHOLD EXPENDITURE

Male headed food expenditure was significantly higher than female headed expenditure, on average, throughout the surveys (2006 and 1091 Taka, respectively) but the pattern was not consistent (Figure 9). Food expenditure did not show a consistent pattern over the four surveys but was highest in survey 4 (Figure 10). There was significant variation between NGOs with the highest spending in DSK across all surveys (Table 30). When analyses were restricted to rural NGOs the pattern of food expenditure was not consistent across the surveys but the average food expenditure over the four surveys was not significantly different. Rural male headed households spent on average more than double the amount spent by rural female households (1847 versus 890 Taka, respectively).

Food per capita expenditure did not show a consistent pattern over the four surveys and was highest in survey 4 (Figure 11). The urban area had the highest mean food expenditure (Table 30) and male headed households spent more on food, on average, than female headed households (17.5 and 14.9 Taka pppd, respectively, although the difference between households appeared to be increasing (Figure 12). The pattern of food per capita expenditure varied significantly ( $p < 0.001$ ) by NGO across surveys.

When the rural NGOs were analysed separately there was no significant difference in overall means (average of the four surveys) but male headed households spent significantly more than female headed households (16.6 versus 13.7 Taka pppd).

Household expenditure over the previous month, on average, fell between surveys 1 and 2 but increased thereafter and by survey 4 was 44% higher than survey 1 (584 Taka and 844 Taka, surveys 1 and 4, respectively). Urban expenditure was far higher, on average, than rural expenditure (Table 30) and male headed households spending was significantly higher (754 versus 566 Taka in male and female headed households respectively,  $p = 0.002$ , Figure 13). When the rural areas were analysed separately, there was still a just significant difference between overall means ( $p = 0.035$ ) mainly due to the difference between NETZ and SCF means (Figure 14, Table 30). Rural male headed households spent more, on average, (480 Taka) than female headed households (312 Taka,  $p = 0.007$ ).

Household per capita expenditure did not vary significantly over the four surveys and the main finding was the significantly higher spending in the urban area (Table 30). There was no significant difference between male and female headed means (Figure 15) and there were no significant differences between the overall rural means (Figure 16).

Work related expenditure and per capita did not vary significantly across surveys, by NGO or by head of household (Figures 17 and 19). The amount spent on work-related items increased significantly across the surveys from 21 Taka to 101 Taka between surveys 1 and 4 ( $p = 0.042$ ) and there was considerably more spent in the urban areas, on average, than in the rural areas (mean 209 versus 38 Taka, respectively, Table 30) although the gap



appears to be lessening (Figures 18 and 20). There was no significant difference in work related expenditure between male and female headed households.

Total expenditure showed a fall between surveys 1 and 2 (2128 and 1890 Taka, respectively) and then an increase in surveys 3 and 4 (2363 and 2631 Taka) with an overall percentage increase in expenditure of 24% between the baseline survey and survey 4 ( $p < 0.001$ ). Male headed household expenditure was significantly greater than female headed by, on average, 1168 Taka (2837 versus 1669 Taka, respectively,  $p < 0.001$ ) and the gap appeared to be increasing (Figure 21). Expenditure in urban areas was more than double that found in the five rural areas (Table 30 and Figure 22).

The rural analyses indicated that there were significant differences between NGOs with least overall expenditure in NETZ and greatest in SCF. The 6 NGOs differ in their approach to asset transfer, target groups and working areas and more details can be obtained from [www.shiree.org](http://www.shiree.org). Mean expenditure in rural male headed households was more than double that in rural female households (2383 versus 1153 Taka, respectively,  $p < 0.001$ ). The pattern of expenditure also varied significantly between NGOs over the four surveys.

Total per capita expenditure did not vary significantly over the four surveys with expenditure varying between 21.1 and 26.3 Taka pppd, nor were there any significant differences between male and female headed households (Figure 23). Overall the urban areas had greatest expenditure (Table 30 and Figure 24). The rural analyses indicated no significant differences in overall means, by head of household or between NGOs over the four surveys.

Based on the 22 and 26 Taka pppd there was only a significant fall in the numbers below poverty thresholds in rural areas in survey 4 to 50% and 65.6%, respectively (both  $p < 0.01$ , Table 31). In rural areas using the 26 and 30 Taka pppd thresholds there were steady falls from surveys 1 to 4 and in survey 4 only just over 10% of households were below the thresholds compared with 25.0% and 43.8% in survey 1 (22 and 26 Taka pppd, respectively).

Table 30 Estimated (from repeated measures ANOVA) mean and per capita food, household, work and total expenditure averaged over the four surveys

NGO	Food	Food pppd	Household	Household Pppd	Work-related	Work-related pppd	Total expenditure	Total expenditure ppd
CARE	1376	15.3	426	5	58	0.7	1801	19.6
DSK	2448	21.4	1979	19	209	3.2	4677	43.8
NETZ	1198	13.3	259	3	22	0.2	1479	16.7
PAB	1347	16.0	361	4	23	0.3	1730	20.4
SCF	1526	16.0	534	8	47	0.4	2084	24.4
UTTARAN	1394	15.2	398	5	40	0.4	1747	20.5
Total Rural	1368	15.2	396	5	38	0.4	1768	20.3
Total	1548	16.2	660	7	67	0.9	2253	24.2

Table 31 Percentage of household below per capita expenditure (Taka pppd) thresholds over the four surveys

	<22 Taka pppd				<26 Taka pppd			
	Survey				Survey			
Rural	1	2	3	4	1	2	3	4
CARE	54.5	68.5	56.3	40.0	69.1	83.3	79.2	58.2
NETZ	74.6	89.8	76.3	61.0	84.7	98.3	84.7	78.0
PAB	43.1	69.0	63.8	60.3	53.4	81.0	75.9	75.9
SCF	76.8	75.9	53.7	46.4	83.9	81.5	72.2	62.5
UTTARAN	65.0	74.1	64.2	41.7	78.3	87.9	79.2	53.3
Total Rural	62.8	75.6	63.2	50.0	74.0	86.6	78.3	65.6
	<26 Taka pppd				<30 Taka pppd			
Urban	1	2	3	4	1	2	3	4
DSK	25.0	20.9	15.9	10.4	43.8	39.5	20.5	10.4

Figure 9 Mean food expenditure by head of household over the four surveys

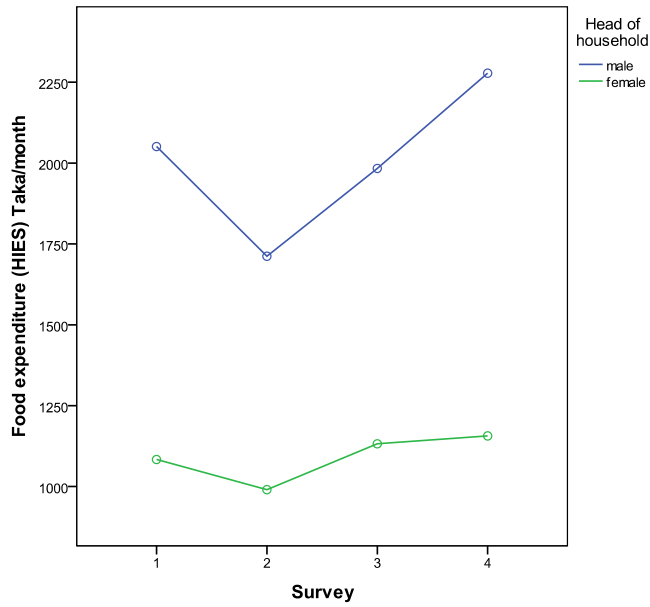


Figure 10 Mean food expenditure by NGO over the four surveys

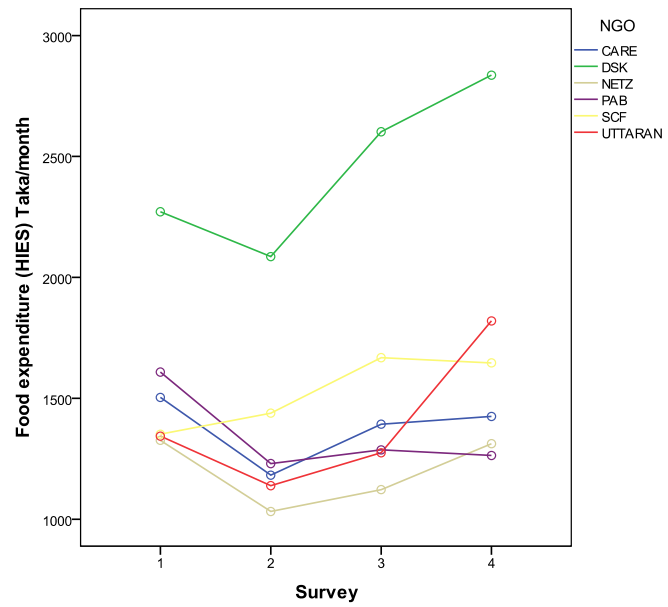


Figure 11 Mean food expenditure pppd by head of household over the four surveys

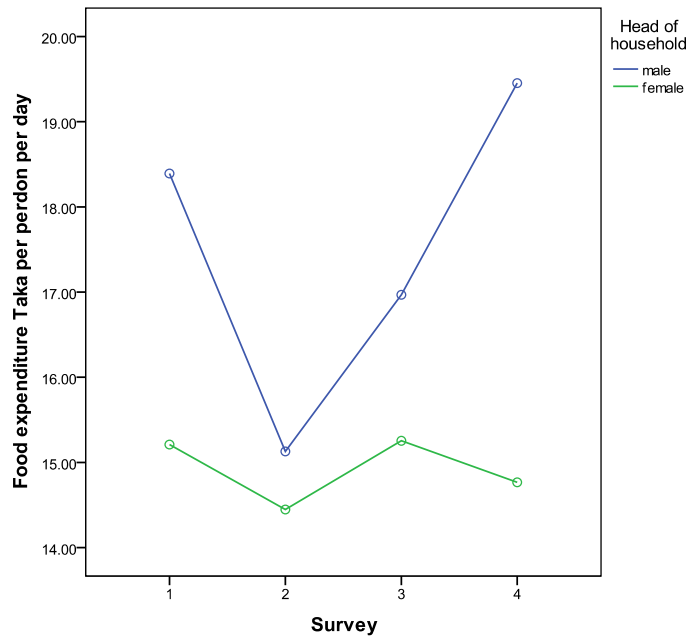


Figure 12 Mean food expenditure pppd by NGO over the four surveys

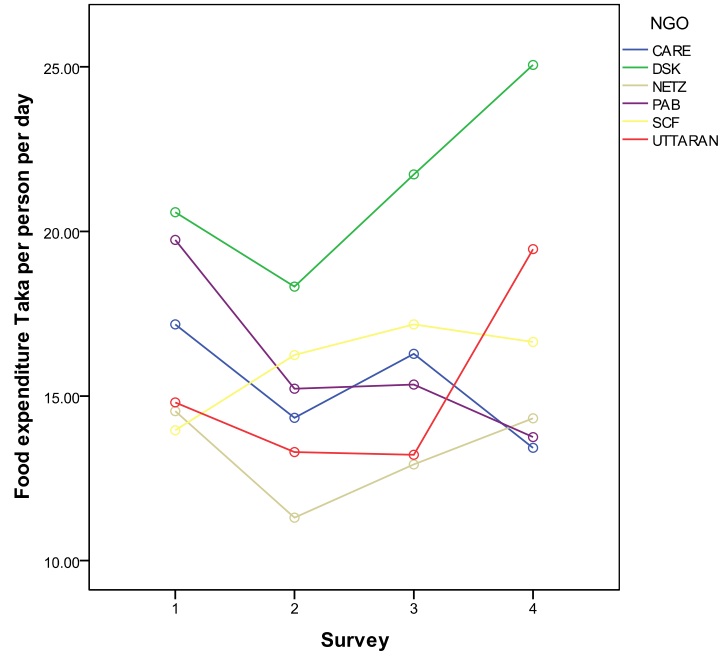


Figure 13 Mean household expenditure by head of household over the four surveys

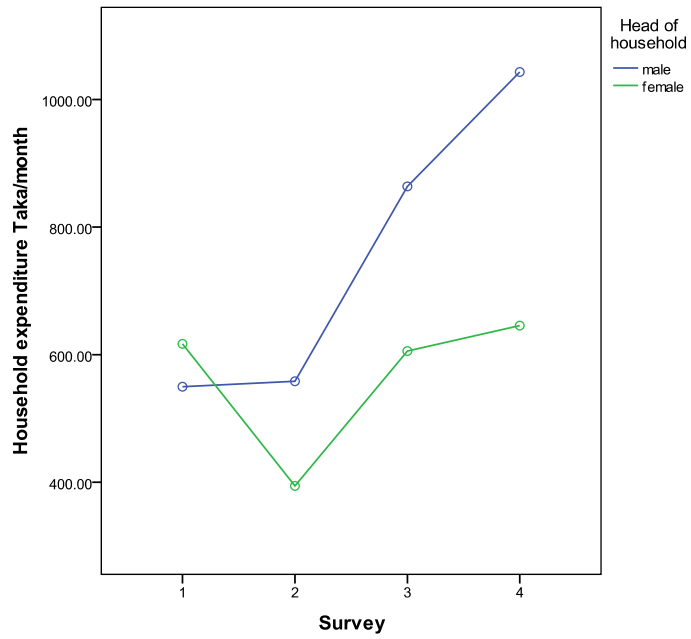


Figure 14 Mean household expenditure NGO over the four surveys

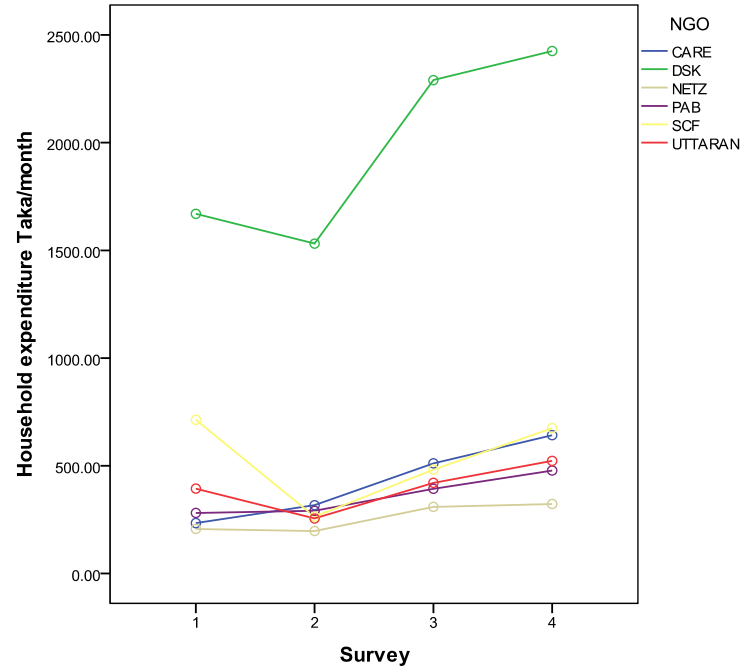


Figure 15 Mean household expenditure pppd by head of household over the four surveys

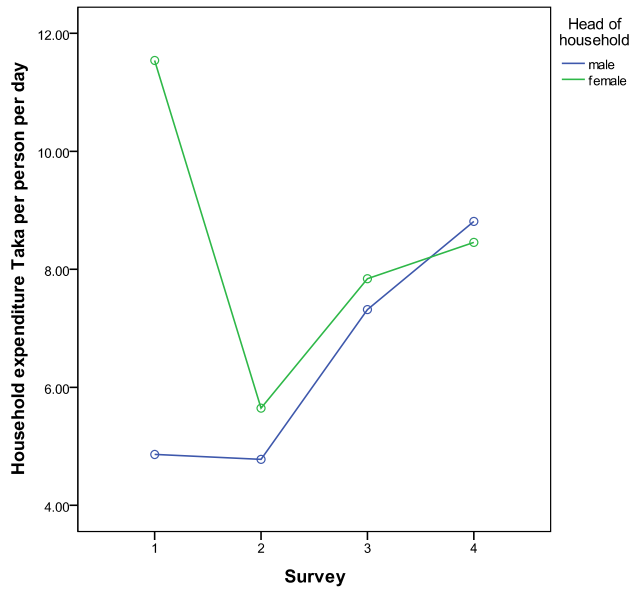


Figure 16 Mean food expenditure pppd by NGO over the four surveys

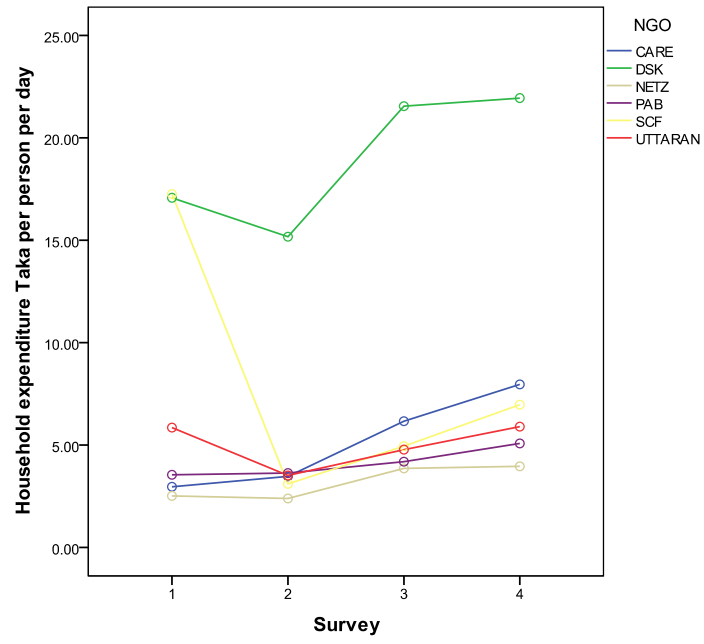


Figure 17 Mean work-related expenditure by head of household over the four surveys

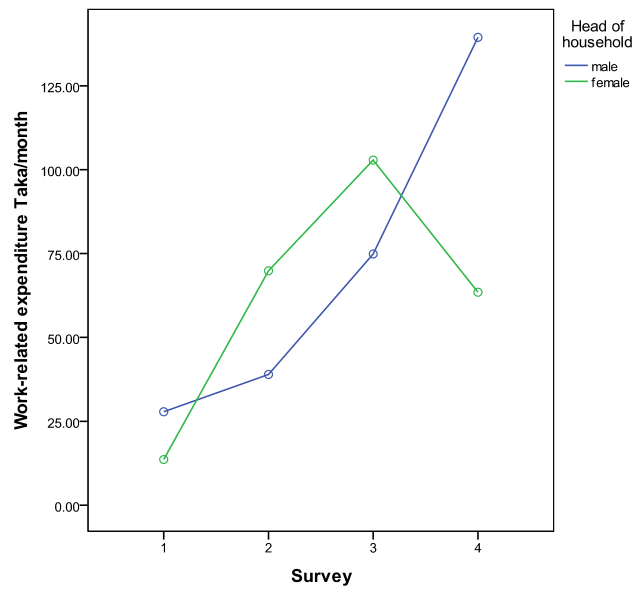


Figure 18 Mean work-related expenditure by NGO over the four surveys

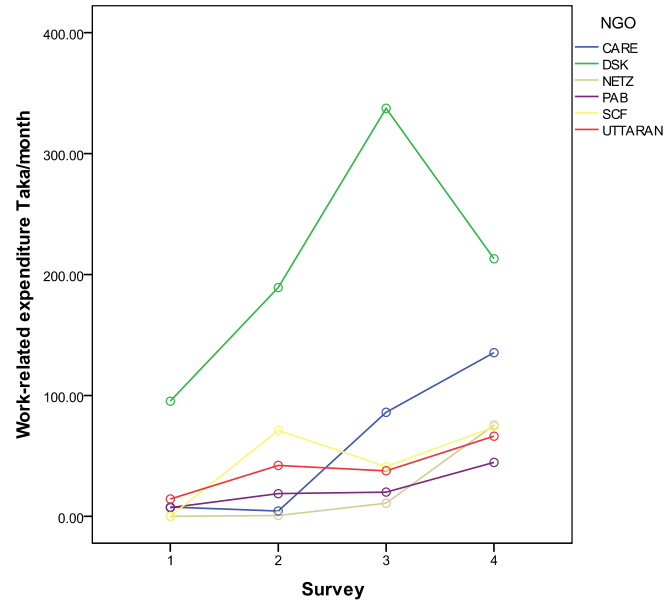


Figure 19 Mean work-related expenditure pppd by head of household over the four surveys

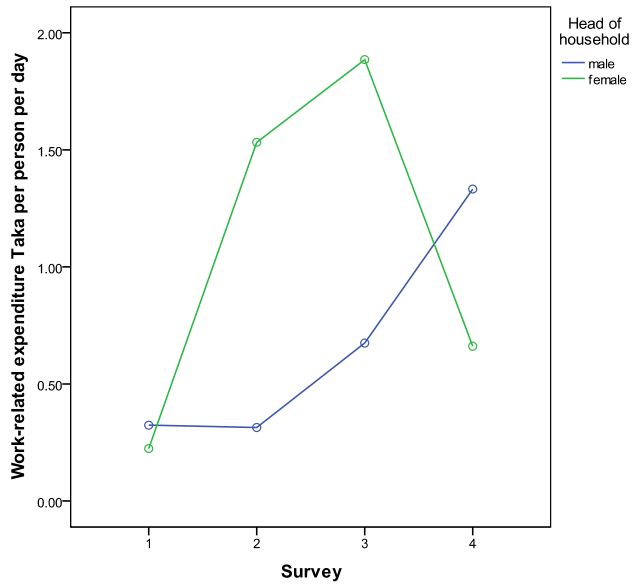


Figure 20 Mean work-related expenditure pppd by NGO over the four surveys

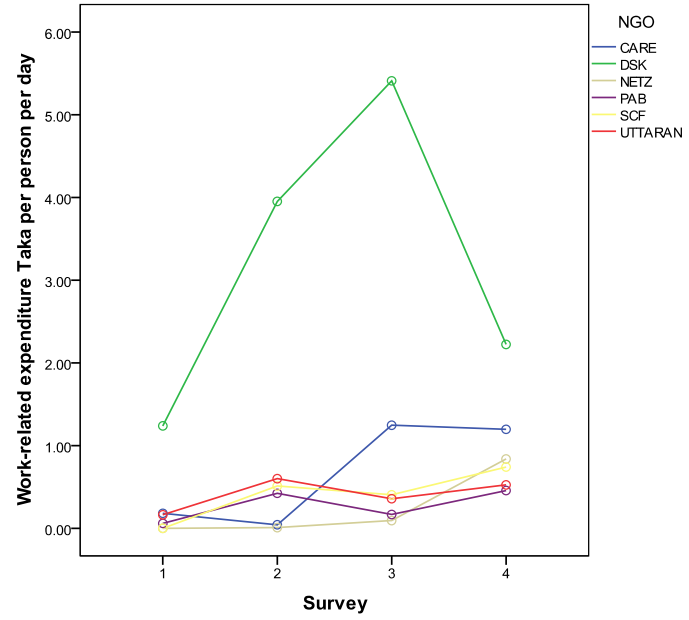




Figure 21 Mean total expenditure by head of household over the four surveys

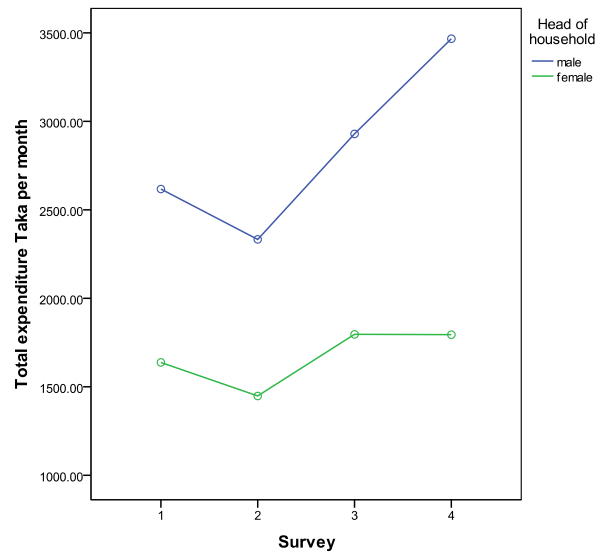


Figure 22 Mean total expenditure by NGO over the four surveys

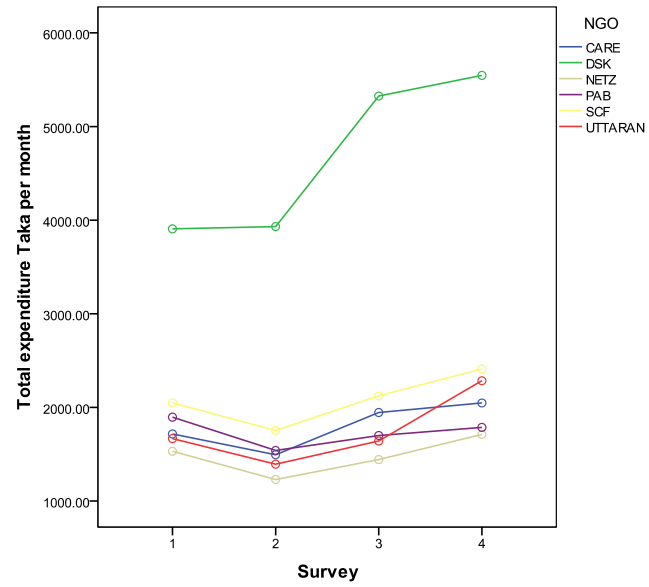


Figure 23 Mean total expenditure pppd by head of household over the four surveys

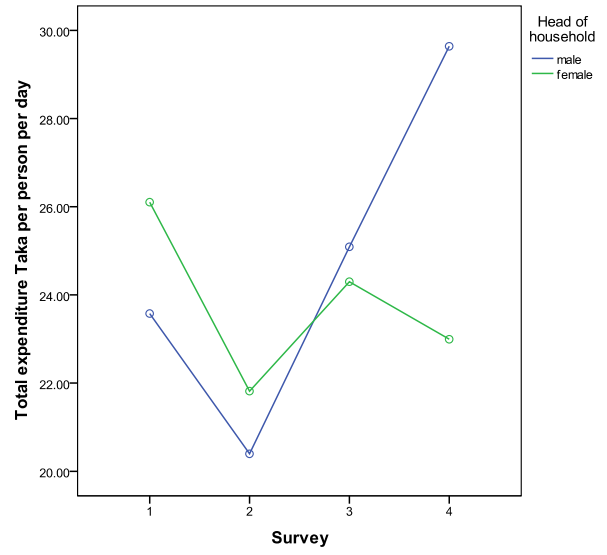
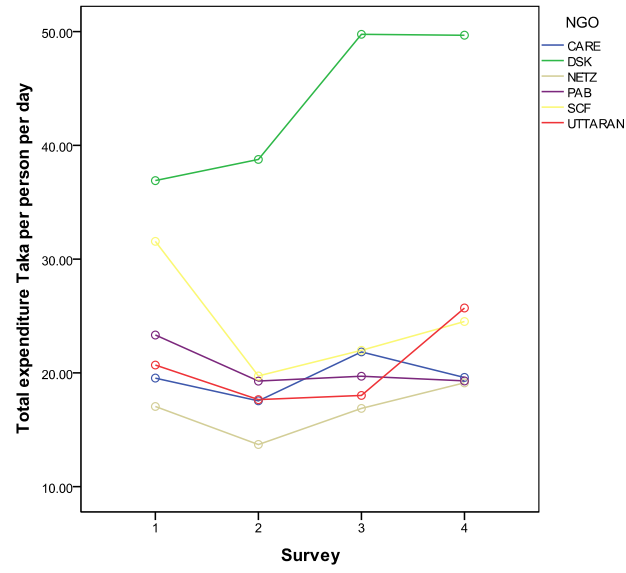


Figure 24 Mean total expenditure pppd by NGO over the four surveys



## 5.12 DIFFERENCE BETWEEN HOUSEHOLD INCOME AND EXPENDITURE

The difference between household income and expenditure based on HIES criteria of income minus expenditure (positive sign indicates credit and negative sign debit) was calculated for each household at each survey. Repeated measures analysis of variance was used to examine the pattern of credit/debit over the four surveys and on average households went from a debit of 168 Taka /month in survey 1 to increasing credit (+10, +228 and +641 in surveys 2 to 4, respectively). There was no significant difference between mean credit of male and female headed households (Figure 25). When the average of the four surveys was calculated all NGOs were in credit (range +205 Taka/month to +516 Taka/month) except for SCF (-256 Taka/month, Figure 26).

Figure 25 Mean net income by head of household over the four surveys

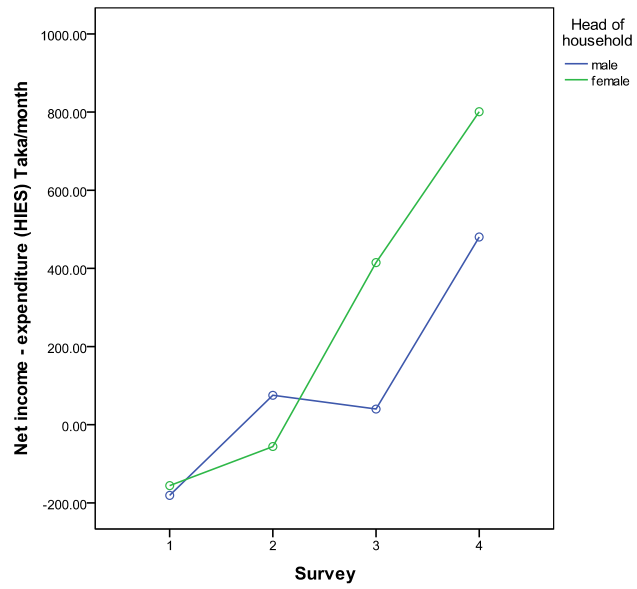
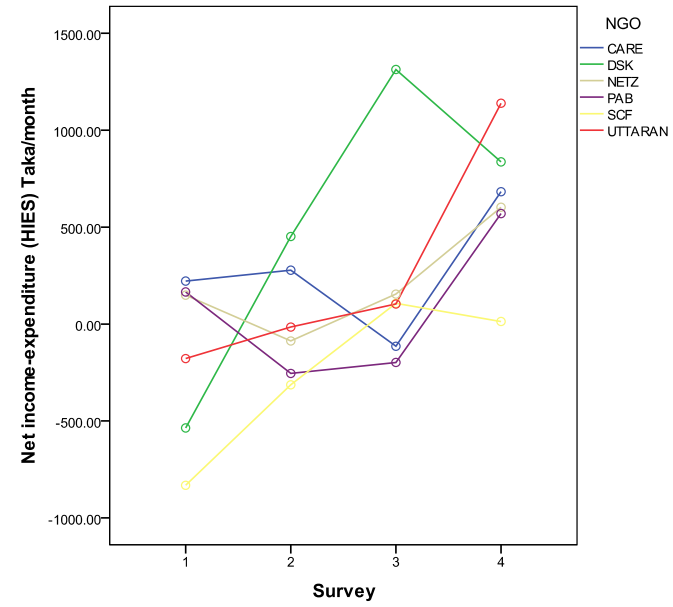


Figure 26 Mean net income by NGOs over the four surveys



## 5.13 HOUSEHOLD FOOD INTAKE

The households were asked how often family members had eaten 13 food items in the 7 days prior to the study (Table 32). Rice was eaten by nearly all households in all four surveys and potatoes were consumed by most households in March. Egg and poultry consumption increased significantly in survey 4.

The extent of household food diversity was determined in two ways (a) based on the mean of the number of foods eaten (maximum 13) and (b) based on the 7 food groups (grains, roots and tubers, legumes and nuts, dairy products, flesh foods, eggs, vitamin A rich fruits and vegetables and other fruit and vegetables) as defined by WHO and UNICEF. Consumption of any amount of food from each food group is sufficient to 'count' i.e. there is no minimum quantity.

In the total sample the mean number of foods consumed in the last 7 days increased significantly from 5.9 in survey 1 to 7.1 and 7.0 in surveys 2 and 3, respectively before falling to 6.7 in survey 4. There was no significant difference between male and female headed households (Figure 27) but there was highly significant difference ( $p < 0.001$ ) between NGOs with DSK having the highest mean (7.8) and SCF and UTTARAN the lowest (6.4, Figure 28). Repeated measures analysis of variance just with the rural NGOs still revealed a significant difference in average of the four surveys ( $p = 0.02$ ). Food diversity also varied by surveys with least diversity in survey 1 (4.3) increasing to 5.0 in survey 2 and falling to 4.9 and 4.8 in surveys 3 and 4 respectively. There was no significant difference between male and female headed household means (Figure 29). DSK had the highest mean diversity (5.0) and NETZ, PAB and SCF the least (4.5,  $p < 0.001$ , Figure 30). There was no significant heterogeneity between rural means.

Table 32 Number of days (%) in the last week that household members consumed foodstuffs

Food	Survey				p
	1	2	3	4	
Rice					-
0	0	0	0.9	0	
1	0	0	0.3	0	
2	0	0.3	0	0	
3+	100	99.7	98.9	100	
Flour					<0.001
0	72.3	64.0	66.9	76.5	
1	10.4	16.5	15.5	8.0	
2	8.6	11.4	10.7	6.8	
3+	8.6	8.1	6.9	8.6	
Pulse					<0.001
0	61.0	37.2	35.8	54.8	
1	23.8	32.7	25.7	22.6	
2	9.8	21.3	24.2	14.9	
3+	5.4	8.7	14.3	7.7	
Potato					<0.001
0	1.5	2.7	9.3	0.9	
1	1.8	2.7	7.5	0.9	
2	5.4	10.2	13.5	0.3	
3+	91.4	84.4	69.8	97.9	
Green vegetables					<0.001
0	18.8	6.9	6.3	13.7	
1	16.4	11.1	14.4	22.3	
2	30.4	27.9	28.1	31.8	
3+	34.5	54.1	51.2	32.1	
Other vegetables					<0.001
0	5.1	5.4	17.1	8.9	
1	3.6	6.3	8.4	9.8	
2	22.9	21.6	20.1	19.3	
3+	68.5	66.7	54.5	61.9	
Fruits					<0.001
0	91.4	58.0	54.5	72.3	
1	6.0	26.4	16.8	9.2	
2	1.5	7.5	15.9	11.6	
3+	1.2	8.1	12.9	6.8	
Milk					0.007
0	92.0	84.4	86.2	83.3	
1	5.1	7.5	4.5	8.3	
2	0.9	3.9	3.9	2.1	
3+	2.1	4.2	5.4	6.3	
Eggs					<0.001
0	70.2	54.4	56.3	40.5	
1	22.6	30.0	21.6	24.4	
2	3.6	11.1	16.5	18.8	
3+	3.6	4.5	5.7	16.4	
Fresh fish					<0.001
0	37.5	20.1	10.5	23.8	
1	33.6	33.9	23.4	26.8	
2	17.9	21.6	27.8	21.7	
3+	11.0	24.3	38.3	21.7	
Dried fish					ns
0	73.8	79.9	79.9	78.1	
1	9.8	9.6	7.2	8.3	
2	8.9	5.4	4.8	6.3	
3+	7.4	5.1	8.1	6.8	
Poultry					<0.001
0	95.5	92.2	91.3	83.8	
1	3.0	6.9	7.8	11.9	
2	0.6	0.3	0.6	3.6	
3+	0.9	0.6	0.3	0.9	
Meat					<0.001
0	90.5	92.8	97.3	92.0	
1	7.4	5.1	1.5	6.8	
2	1.5	0.6	0.3	0.9	
3+	0.6	1.5	0.9	0.3	
Mean foods eaten	5.9	7.1	7.0	6.7	<0.001
Mean food diversity	4.3	5.0	4.9	4.8	<0.001

Figure 27 Mean number of foods consumed by Head of household over the four surveys

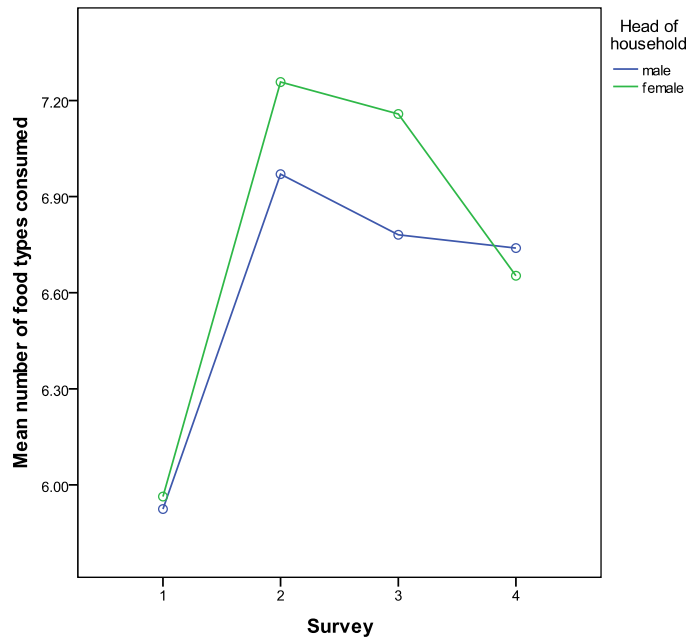


Figure 28 Mean number of foods consumed by NGO over the four surveys

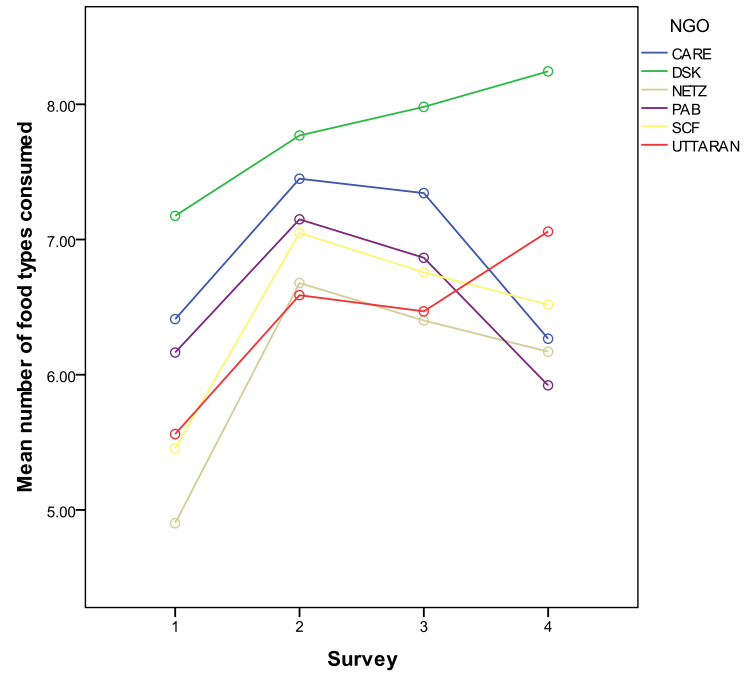


Figure 29 Mean food diversity by head of household over the four surveys

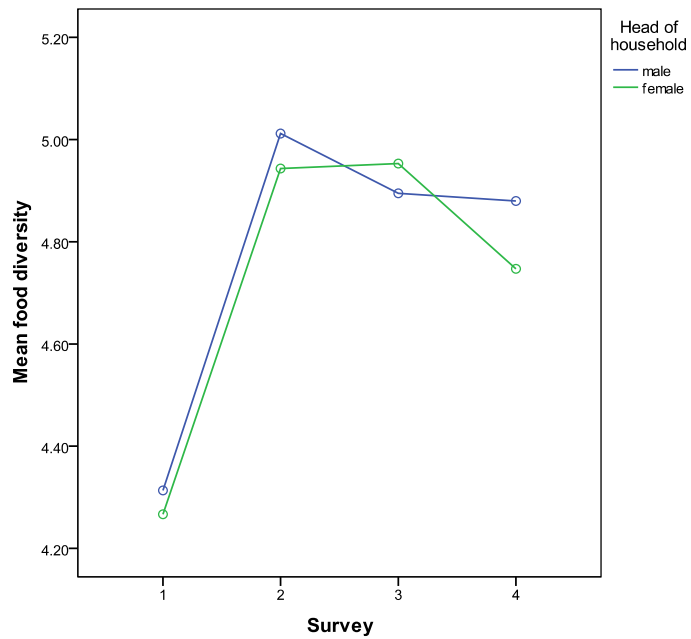
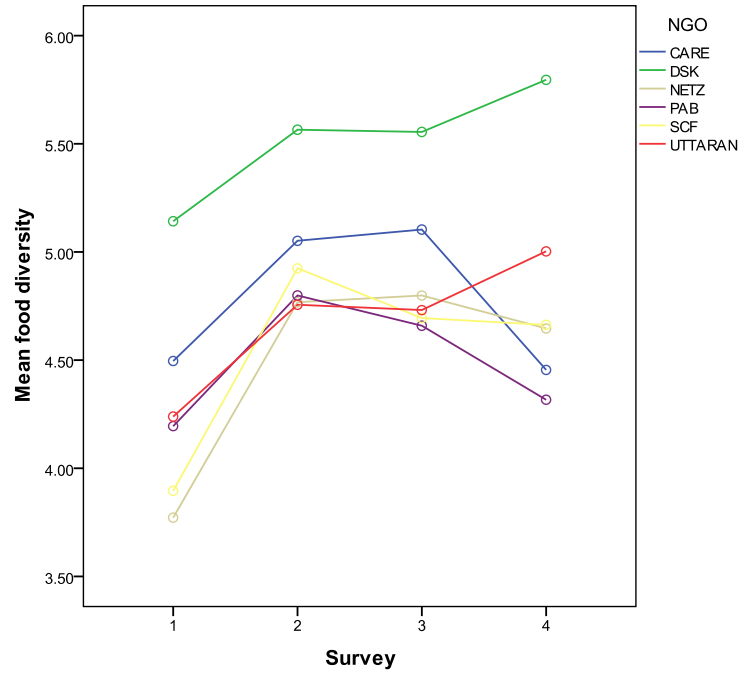


Figure 30 Mean food diversity by NGO over the four surveys





## 5.14 HOUSEHOLD FOOD SECURITY

The households were asked about the coping strategies they used as a result of financial hardship in the seven days prior to the survey with a pre-coded list of 10 food strategies (Table 33). There were significant improvements in 6 of the 10 strategies. For example households reported eating smaller portions of food between March 2010 and March 2011 fell from 83.6% to 51.8%; eating less than 3 meals a day (down from 67.6% to 39.3%), eating food of less quality (down from 63.4% to 32.1%) and less adults ate no food in the previous 24 hours (down from 6.9% to 1.8%). Eating gathered food appeared to be seasonal lower in March and higher in July and October. Borrowing money to buy food fell from 19.5% to 9.5% and buying food on credit fell from 28.6% to 21.4%. There was significant improvement (reduction) in food coping strategies with a fall in mean from 3.3 to 2.2 between surveys 1 and 4. There was no significant difference in mean coping strategies between male and female headed households (Figure 31) but there were significant differences between NGOs and DSK had the best mean food coping strategy (1.6) and PAB the worst (4.0,  $p < 0.001$ , Figure 32).

Table 33 Food coping strategies over the four surveys

Food Strategy	Survey				p
	1	2	3	4	
Eat smaller portion					<0.001
0 days	16.4	21.0	32.3	48.2	
1 day	8.9	13.5	7.5	8.3	
2 days	27.7	32.3	20.7	18.8	
3+ days	47.0	33.2	39.5	24.7	
Eat < 3 times a day					<0.001
0 days	32.4	28.4	49.4	60.7	
1 day	4.2	4.8	6.3	3.6	
2 days	16.7	16.5	11.7	13.1	
3+ days	46.7	50.3	32.6	22.6	
Eat food of less quality					<0.001
0 days	36.6	50.3	53.3	67.9	
1 day	21.7	20.1	9.5	10.7	
2 days	20.5	18.6	15.8	12.8	
3+ days	21.1	11.1	21.1	8.6	
Eat gathered food					<0.001
0 days	79.8	50.6	58.9	81.3	
1 day	9.2	15.0	11.6	9.2	
2 days	8.3	15.3	14.0	7.1	
3+ days	2.7	19.2	14.9	2.4	
Eat no food in 24 hours adult					0.004
0 days	93.2	97.3	97.3	98.2	
1 day	6.0	1.5	2.1	1.8	
2 days	0.9	0.6	0.6	-	
3+ days	-	-	-	-	
Eat no food in 24 hours child					ns
0 days	99.7	99.4	99.7	100	
1 day	0.3	0.3	0.3	-	
2 days	-	0.3	-	-	
3+ days	-	-	-	-	
Borrow money to buy food					0.006
0 days	81.3	80.5	82.1	90.5	
1 day	11.0	10.8	9.8	6.0	
2 days	6.0	7.5	4.5	3.3	
3+ days	1.8	1.2	3.0	0.3	
Bought food on credit					0.006
0 days	71.4	64.1	70.1	78.6	
1 day	11.0	16.2	11.4	8.9	
2 days	11.3	10.8	9.6	8.6	
3+ days	6.3	9.0	9.0	3.9	
Send family member elsewhere for food					ns
0 days	83.0	88.6	84.5	86.9	
1 day	5.1	4.5	3.0	1.8	
2 days	5.4	3.0	6.3	6.5	
3+ days	6.5	3.9	5.7	4.8	
Give more food to earning household members					0.002
0 days	65.2	62.3	62.6	67.6	
1 day	3.0	2.1	0.6	-	
2 days	6.8	7.2	8.1	2.4	
3+ days	25.0	28.4	28.7	30.1	
Mean food coping	3.3	3.5	2.9	2.2	<0.001

Figure 31 Mean food coping strategy by head of Household over the four surveys

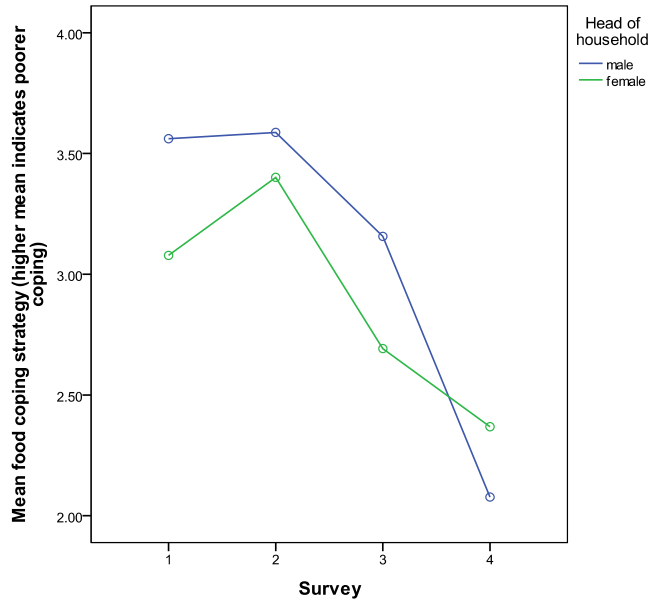
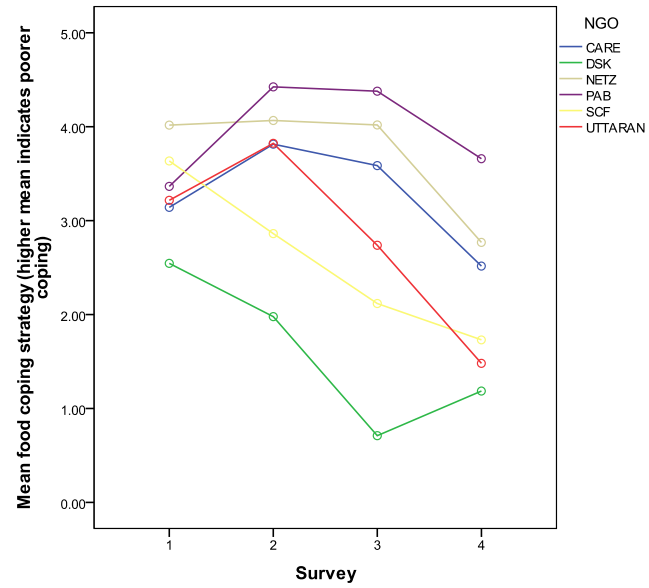


Figure 32 Mean food coping strategy by NGO over the four surveys



## 5.15 SOCIAL EMPOWERMENT

Questions were put separately to the male and female heads of household and to female spouses (Tables 34 and 35). There was no significant change in male responses between surveys 1 and 4. However less women felt that investing in children's education was the best use of scarce resources, less women felt that there were people who could be relied upon to help more women were uncertain about who should decide on use of money

Table 34 Social empowerment (Male replies)

	Survey	Agree	Neither	Disagree	p
Investing in children's education is the best use of my scarce resources	1	98.0	2.0	0	ns
	4	88.9	8.1	3.0	
If you earn money or receive a loan, you decide how to use the money	1	74.7	2.0	23.2	ns
	4	78.8	4.0	17.2	
You feel confident that you can face whatever the future brings/holds	1	74.0	2.0	24.0	ns
	4	80.0	5.0	15.0	
What you say matters in decisions in your household	1	99.0	-	1.0	ns
	4	99.0	-	1.0	
There are people outside your family you can rely on for help	1	60.0	6.0	34.0	ns
	4	56.0	2.0	42.0	

Table 35 Social empowerment (Female replies)

	Survey	Agree	Neither	Disagree	p
Investing in children's education is the best use of my scarce resources	1	93.8	3.9	2.3	0.02
	4	83.7	12.5	3.9	
If you earn money or receive a loan, you decide how to use the money	1	60.1	3.7	36.2	0.042
	4	59.3	7.4	33.3	
You feel confident that you can face whatever the future brings/holds	1	59.3	9.5	31.2	ns
	4	66.9	10.3	22.8	
What you say matters in decisions in your household	1	87.1	2.0	11.0	ns
	4	89.0	3.1	7.8	
There are people outside your family you can rely on for help	1	57.0	6.5	36.5	0.012
	4	51.3	3.4	45.2	
You feel frightened of moving alone outside your village	1	40.2	3.4	56.3	ns
	4	39.1	5.7	55.2	

## 5.16 NUTRITIONAL STATUS

### 5.16.1 Head of Household

In total 124 male and 130 female heads of household had their weight, height and haemoglobin measured in both March 2010 and March 2011. Body Mass Index (BMI, weight (kg)/height (m)<sup>2</sup>) was calculated and adults were placed into one of two categories, either suffering from Chronic Energy Deficiency (BMI <18.5) or normal (BMI ≥ 18.5). Haemoglobin (Hb) level was obtained from a finger prick of blood using a portable haemoglobin analyser (HemoCue, HomoCue Ltd., Sweden). Haemoglobin levels were categorised as severe anaemia <70 (g/l), anaemia 70 - 129.9 in males and 70 – 119.9 in females and normal as ≥130 in males and ≥120 in females. One female head of household had severe anaemia in survey 4 and one male head of household had severe anaemia in both surveys.

There was no significant difference in weight, BMI and haemoglobin in either male or female heads of households (Table 36) but in the total sample there was a just significant increase in weight (by 0.3kg) on average and a concomitant increase in BMI by 0.2 units.

Table 36 Nutritional status by head of household in surveys 1 and 4

Variable	Male			Female			Total		
	Survey		p	Survey		p	Survey		P
	1	4		1	4		1	4	
Mean values									
Weight	47.5	47.8	ns	41.8	42.2	ns	44.6	44.9	0.05
BMI	18.4	18.5	ns	18.9	19.0	ns	18.6	18.8	0.05
Haemoglobin	134.3	135.1	ns	116.0	115.7	ns	124.9	125.1	ns
Categories									
BMI <18.5	51.2	46.3	ns	53.1	51.5	ns	52.2	49.0	ns
Anaemic	35.0	33.3	ns	58.5	56.2	ns	47.0	45.1	ns

Repeated measures analyses of variance were used on the total sample to test for differences in weight, BMI and haemoglobin between surveys 1 and 4 after taking into account age (weight, BMI and haemoglobin values all negatively associated with age), male and female heads of households and differences in NGOs. The analyses revealed that for weight there was an overall increase from survey 1 to 4 of 0.5kg on average (p=0.017), while BMI increased significantly by 0.2 units (p=0.014) while there was no change in haemoglobin between the two surveys. Figure 33 presents the difference in mean weight between surveys 1 and 4 by headship and Figure 34 presents the variation by NGO. There was no significant variation between NGOs for either weight or BMI and all showed an increase in BMI and weight except for PAB.

The prevalence of both CED and anaemia fell, but not significantly, between surveys 1 and 4 in both male and female heads of households as well as in the total sample. A combined CED/anaemia index was generated in which individuals were placed into one of four categories (Table 38) of both CED and anaemic, CED only, anaemic only and normal. There were no significant

changes between surveys 1 and 4 and although in the total sample the percentage with CED and anaemia fell by 4% and the normal percentage increased by 0.8% these improvements were offset by a 1.6% increase in both CED only and anaemia only.

No significant associations were found between socio-economic changes and adult nutritional status.

Table 38 Relationship between CED and anaemia categories (%) in surveys 1 and 4

Head	Survey	CED and anaemic	CED only	Anaemic only	Normal	p
Male	1	21.5	28.1	14.0	36.4	ns
	4	16.5	30.6	16.5	36.4	
Female	1	36.4	17.1	21.7	24.8	ns
	4	33.3	17.8	22.5	26.4	
Total	1	29.2	22.4	18.0	30.4	ns
	4	25.2	24.0	19.6	31.2	

Figure 33 Mean weight of head of household in surveys 1 and 4

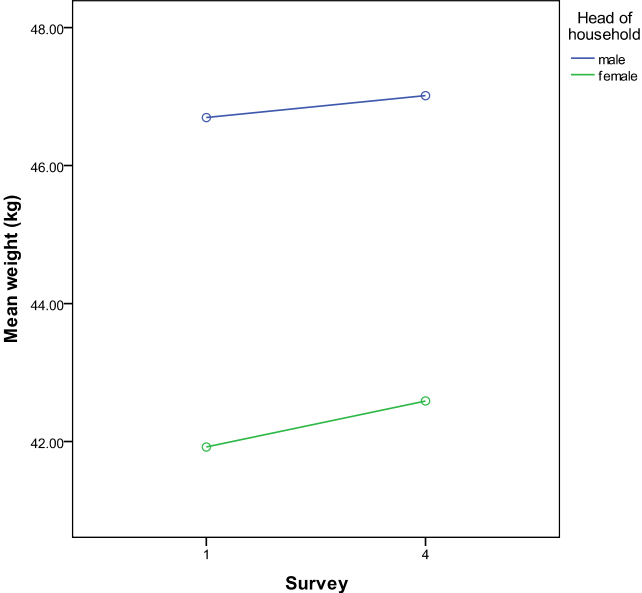
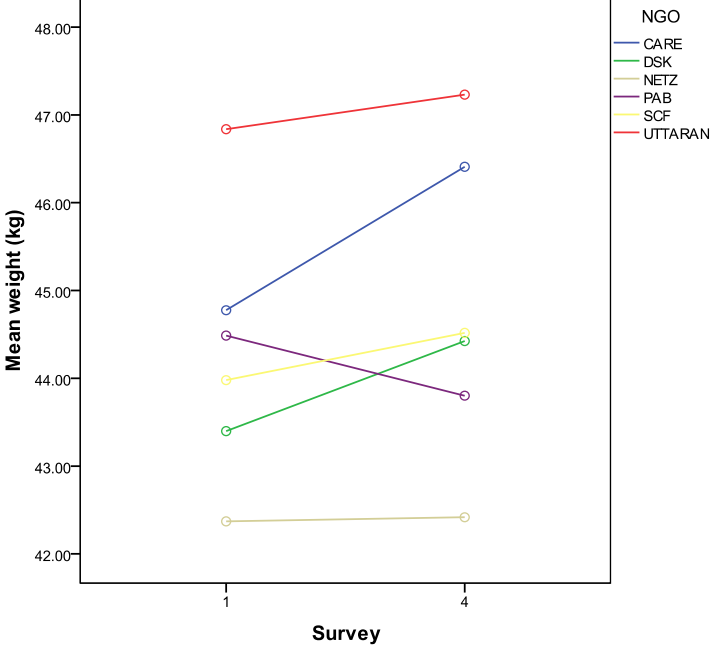


Figure 34 Mean weight by NGO in surveys 1 and 4





### 5.16.2 Under 5 year old children

Information on nutritional status was available on the same 102 children in surveys 1 and 4. In rural areas height-for-age z-score significantly worsened between the two surveys, but there was no other significant change in mean z-scores (Table 39). In surveys 1 and 4 there were also significant urban-rural differences with worse means for height-for-age ( $p=0.038$  and  $p=0.049$ , respectively) while weight-for-age z[-score was significantly worse in the urban areas only in survey 4 ( $p=0.022$ ). Haemoglobin concentration improved by 4 g/l and the percentage of children with anaemia fell by 13% overall, significantly in the urban areas.

No significant associations were found between socio-economic changes and child nutritional status.

Table 39 Change in nutritional status

Location	Nutritional status	Survey		p	Prevalence	Survey		P
		1	4			1	4	
Urban	Mean				Stunting	69.2	69.2	ns
	Height-for-age	-2.81	-2.81	ns	Underweight	71.4	71.4	ns
	Weight-for-age	-2.42	-2.53	ns	Wasted	28.6	28.6	ns
	Weight-for-height	-0.86	-0.98	ns	Anaemic	78.6	35.7	0.035
Rural	Haemoglobin	104.2	111.6	0.015	Stunting	44.9	47.2	ns
	Height-for-age	-1.61	-2.03	0.026	Underweight	42.0	50.0	ns
	Weight-for-age	-1.69	-1.92	ns	Wasted	22.7	21.6	ns
	Weight-for-height	-1.00	-0.80	ns	Anaemic	51.6	43.0	ns
Total	Haemoglobin	107.9	111.5	0.036	Stunting	48.0	50.0	ns
	Height-for-age	-1.88	-2.04	ns	Underweight	46.1	47.1	ns
	Weight-for-age	-1.88	-2.02	ns	Wasted	23.5	22.5	ns
	Weight-for-height	-1.16	-1.23	ns	Anaemic	55.1	42.1	0.029
	Haemoglobin	107.5	111.5	0.009				