NUTRITIONAL ANTHROPOMETRIC AND MORTALITY SURVEY

FINAL REPORT

MANDERA CENTRAL DISTRICT

NORTH EASTERN PROVINCE, KENYA

March 2011

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List of Abbreviations

ADRA	Adventist Development and relief Agency
ARLMP	Aridlands Resource management project
ASAL	Arid and Semi Arid lands
CI	Confidence Interval
CMR	Crude Mortality Rate
COCOP	Consortium of Cooperating partners
DHMT	District health Management Team
DNO	District Nutrition Officer
ENA	Emergency Nutrition Assessment
HSNP	Hunger Safety Net project
IMAM	Integrated management of Acute malnutrition
MCH	Maternal and Child health
NEP	North eastern province
SMART	Standardised Monitoring and Assessment of Relief and Transitions
U5MR	Under Five mortality rates
WATSAN	Water and sanitation
WFP	World Food Programme

1 Executive Summary

Mandera Central is one of the districts that form the North Eastern Province (NEP) and is one of the districts gazetted as part of the Arid and Semi-Arid Lands of Kenya (ASAL). The district is located in the North West horn of Kenya bordered by Mandera East District and Somalia to the east, Mandera West District and Wajir North District to the west, Wajir District to the south and Ethiopia to the north. Mandera central district administratively consists of 5 divisions including El Wak, Shimbir Fatuma, Wargadud, Qalanqalesa and Kotulo and has its headquarters in El Wak town.

The District is prone to extreme climatic conditions characterized by successive droughts and floods leading to chronic food insecurity. This has rendered the population reliant on food aid.

Save the Children UK has been operating in all the 5 divisions of Mandera Central namely Elwak, Shimbir Fatuma, Qalanqalesa, Kotulo and Wargadud since August 2007. Within the five divisions there are a total of 7 Government of Kenya (GOK) health facilities including El Wak district hospital, covering a projected population of 63,025 people[1].
Nutrition surveys have been conducted in the area since 2006 and serve as a surveillance system. This survey was conducted from 1st of March to 17th of March 2011.

Specific Objectives
The survey aimed at estimating the;

- The prevalence of acute and chronic malnutrition in children aged 6-59 months;
- The nutrition status pregnant women and mothers with children <5 years ;
- The crude and under five mortality rate and causes of death;
- The proportion of households with access to improved water and sanitation;
- The coverage and content of the general food distribution;
- The food access and dietary diversity at household level;
- The Coverage of measles and BCG vaccination among target children;
- The Coverage rate of Vitamin A. supplementation and de worming;
- The Morbidity rates of children 6-59 months 2 weeks prior to the survey;
- To recommend appropriate interventions based on the survey findings;

Methodology
A two stage cluster sampling using SMART (Standardised Monitoring Relief and Transition) methodology was employed with identification of clusters being proportional to the population size. The target population for the anthropometric survey was children aged 6-59 months.

Data was collected on anthropometry, morbidity, vaccination and de-worming status, Vitamin A supplementation, hygiene and sanitation practices and food security.

Retrospective information on mortality was collected using the current household census method, with a recall period of 115 days, from all households visited including those without children under the age of five. A total of 35 clusters and 750 households were visited and 765 children from 6 to 59 months were assessed for anthropometry and other indicators.

Anthropometric and mortality data were analyzed using the ENA software version November 2008. Qualitative and quantitative data was analyzed using the EpiInfo/ ENA software.

[1] Figures obtained from the District Development Office- Mandera Central.

Main Results

Table 1: Results summary for acute malnutrition

WHO(2006) **N=759**	***Z- score***	***Global Acute Malnutrition*** W/H< -2 z and/or oedema	(210) **27.5%** (23.2% -32.2% 95% CI)
		Severe Acute Malnutrition W/H < -3 z and/or oedema	(26) **3.4%** 2.3% - 4.9% 95% CI)
NCHS(1977) **N=761**	***Z-score***	***Global Acute Malnutrition*** W/H< -2 z and/or oedema	(203) 26.7% (22.6% -31.2% 95% CI)
		Severe Acute Malnutrition W/H < -3 z and/or oedema	(5) 0.7% (0.3%- 1.5% 95% CI)
MUAC Analysis [N=765]		***Global Acute Malnutrition*** MUAC (<12.5 cm)	(49) 6.4%
		Severe Acute Malnutrition MUAC (<11.5 cm)	(7) 0.9%
		At risk of malnutrition MUAC (≥12.5 and <13.5cm)	(156) 20.4%
		Oedema present	(0) 0%

Table 2: Summary results for Mortality

	CMR (N:2997)	**U5 MR (N:1035)**
Deaths per 10,000/Day	**0.35 (0.20-0.63) 95%CI**	**0.83 (0.37-1.87) 95%CI**

Table 3: Summary results for Morbidity

Illness 2 weeks preceding the survey	**Frequency**	**Percentage prevalence**
Diarrhea	47	22%
Fever cough difficulty in breathing	66	31%
Fever with Chills like Malaria	129	61%
Intestinal Parasites	2	1%
Measles	2	1%
Other	4	2%
skin infection	15	7%
Stomach ache	4	2%
Toothache	1	0.5%
Vomiting	46	22%
Eye infections	2	1%

Table 4: Immunization coverage and Vitamin A supplementation

MEASLES [N= 727] 9-59 MONTHS	By card2 According to caretaker3 Not immunized	(334) 45.8% (370) 50.6% (23) 3.1%
OPV 1 [N= 765]	By card According to caretaker Not immunized	(368) 48.1% (389) 50.8% (7) 0.9%
OPV 3 [N= 765]	By card According to care taker Not Immunized	((370) 48.4% (381) 48.8% (13) 1.7%
Vitamin A [N=765]	By card According to caretaker Not immunized	(251) 32.8% (250) 32.7% (257) 33.6%
BCG SCAR [N= 765]	Present Absent	(717) 93.7% (48) 6.3%
De-worming [N=765]	Yes No Don't know	(47) 6.1% (710) 92.8% (8) 1.0%

Conclusion

Both the GAM and SAM rates are high and typical for the hunger gap season, during which this survey was undertaken. However, given the failure of the short rains in 2010 and the prediction of an even poorer rain performance during the 2011 long rains expected to start in April, there are prospects of rapid increase in malnutrition rates. The food prices continue to rise and given that a majority of the population relies on food aid which only lasts on average two weeks and have to purchase food for the rest of the month, food security at household level is likely to be further compromised.

Recommendation

Health and Nutrition

Immediate

- Scale up community mobilization activities in order to provide early detection and referral of the acutely malnourished
- Continue implementing the IMAM programme and where applicable start up new outreach sites.
- Promote use of insecticide treated mosquito net.
- Implement mass campaigns to improve Vitamin A and De-worming coverage (including targeting Early Childhood Development centers (ECDC)
- Preventive health care measures to reduce diseases which exacerbate malnutrition (Diarrhoea and malaria) e.g. accelerated health education
- Increase Public Health Promotion programs to distribute PUR sachets, Aqua tabs, soap, jerry cans, mosquito nets

Medium term

- Continued health outreach in locations inaccessible to health facilities to offer basic primary health care package
- Focused Health promotion and nutrition education including Infant and Young Child Feeding (IYCF) including diet diversity)
- Integrated health, nutrition and food security programming to address underlying causes

[2] Child welfare clinic cards were checked to verify immunization status of the child
[3] When no card was available, measles vaccination information was collected according to the caretaker

- Strengthen continuous nutrition surveillance through regular nutrition surveys, Programme coverage assessments and MUAC screening.

Long term

- Food security and Livelihood interventions (including disaster reduction and resilience)
- Viable WATSAN interventions

2 Introduction

Mandera Central is one of the districts that form the Mandera County and is gazetted as part of the Arid and Semi-Arid Lands of Kenya (ASAL). The district is located in the North West horn of Kenya bordered by Mandera East District and Somalia to the east, Mandera West District and Wajir North District to the west, Wajir District to the south and Ethiopia to the north. Mandera central district administratively consists of 5 divisions including El Wak, Shimbir Fatuma, Wargadud, Qalanqalesa and Kotulo and has its headquarters in El Wak town.

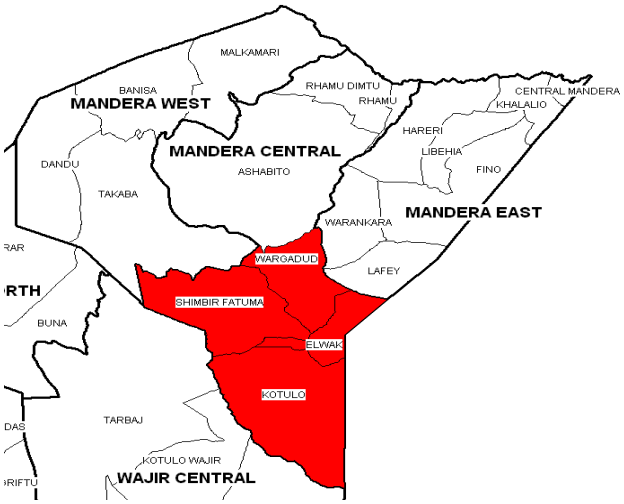
Mandera central district as is the rest of Mandera county is characterized by long dry spells, interspersed with low erratic rainfall. Recent climatic hazards such as the long dry spell occasioned by the failure of the rains in late 2008 and 2009 and the short rains in 2010, coupled with conflict from Somalia continued to have a devastating impact on the traditional livelihoods of pastoralist populations in the area. Mandera County continues to suffer from structural deficits in the provision of health care, education and water and sanitation infrastructure. Despite many years of humanitarian and relief interventions and improved government assistance, the North Eastern Province of Kenya is still largely food insecure.

Save the Children UK operates in all the 5 and is currently implementing an integrated Nutrition and health programme that aims to treat the acutely malnourished whilst strengthening the health systems to provide curative and preventive health services.

Relief Programmes currently in the area:

- CARE: Water, Hygiene and Sanitation
- Kenya Red Cross: Emergency relief
- Save the children UK: Treatment of acute malnutrition, Hunger safety net programme (HSNP, Health Outreach, WATSAN
- COCOP/WFP: Food Aid
- ADRA: Primary Health Care
- Office of the President: Food Aid
- APHIA II: Mother and Child Health (MCH), HIV/AIDS
- Northern Aid: WATSAN, HIV/AIDS
- DANIDA: Nomadic Clinic

Figure 1: Map of the area



2.1 Survey objectives

The overall goal of the survey was to assess the health and nutritional status of children less than 5 years of age.

The specific objectives of the survey aimed at estimating:

- The prevalence of acute and chronic malnutrition in children aged 6-59 months;
- The nutrition status of women of child bearing age 15-49 years;
- The crude and under five mortality rate and causes of death;
- The proportion of households with access to improved water and sanitation;
- The coverage and content of the general food distribution;
- The food access and dietary diversity at household level;
- The Coverage of measles and BCG vaccination among target children;
- The Coverage rate of Vitamin A. supplementation and de worming;
- The Morbidity rates of children 6-59 months 2 weeks prior to the survey;
- To recommend appropriate interventions based on the survey findings;

3 Methodology

3.1 Survey methodology

The survey employed the standardised monitoring of relief and transitions (SMART) sampling methodology. Emergency Nutrition Assessment (ENA) for SMART software was used to determine sample size for anthropometry and retrospective mortality. Children from 6 to 59 months of age were included in the sampling. Two stage cluster sampling was applied to assign clusters and to select the survey population. A local events calendar was used to aid mothers in accurate determination of the ages of their children. The principle of Probability Proportional to Population Size (PPS) was used in the identification of clusters using ENA for SMART software version November 2008.

A total population of 63,025 was estimated for the survey area covering the five divisions. Information on population figures was obtained from the District Development Officer (DDO) in Elwak based on projections from the 2009 National Census. The survey training took place from 1st -4th March 2011 while data collection was conducted from 11th to 17th March 2011.

3.2 Sampling Procedure and Sample Size Calculation for Anthropometric Data

The sample size was calculated using the ENA for SMART software package. The number of children under 5 (U5) in the survey area was estimated at 20% of the total population (12,605 children). In addition to the under five population data, the following basic assumptions were made:

1. Estimated prevalence of malnutrition is 29.4 %[4]
2. Design effect is 2.0 and the standard margin of error is 5% (95% CI).

The above data was entered to ENA/SMART software and generated 638 children as minimum sample size. The corresponding number of household to get 638 children was determined be 750 households.

[4] The highest C.I of the past malnutrition rates (2010 nutrition survey)

3.3 Sampling Procedure and Sample Size Calculation for Mortality Data

Similarly the 2010 mortality survey results were considered during planning for the mortality survey. The estimated population was (63,025[5]), estimated Crude Mortality Rate (CMR) of 0.46[6], precision (0.5), recall period (115 days) and design effect (2) were entered into Nutrisurvey for SMART which yielded a total of after which a sample size of 750 HH was generated.

After considering the time spent traveling, establishing the first household and time taken to administer each questionnaire and the breaks, it was estimated that a total of 22 households would be covered in a day and from each cluster, 21 children would be measured. A total of 35 clusters were included.
The recall period was 115 days to coincide with the day for IDD (16th November 2010)

3.4 Selection of households and children

In the second stage of sampling i.e. household selection the Expanded Programme on Immunization (EPI) method was employed to select the households. A household was defined as people who shared a cooking pot even though not necessarily related to each other. If there were several structures within the same compound but each had their own cooking pots, then they were regarded as separate households. Each survey team with the help of a village elder moved to the centre of the village where they spun a pen and walked to the direction the pen faced to the edge of the village. While at the edge of the village, the team spun a pen again and walked alongside this second line counting each house on the way. Using random numbers list, the team selected the first house to be visited by randomly selecting a number between 1 and the total number of households counted. The randomly selected number became the first household and thereafter the subsequent household was determined by standing at the doorstep of the sampled house as if walking away and the house on the right became the next household to be visited. If a sampled house had no children 6-59 months, only the mortality questionnaire was administered. This process continued until the required number of children (21) was achieved. If they got the required number of children before going to 22 households, they continued until they reached the required number this time only administering the mortality questionnaire.

In the event there was no one at home in a selected house, a neighbour was consulted concerning the whereabouts' of the members of the household. If the members had permanently left and were not expected to return, the household was skipped and not replaced. If the household members were expected to return, the survey team revisited the house at least once more before leaving the cluster.

The villages that were assigned more than one cluster were equally divided and the centre of each subdivision determined and the households to be surveyed were selected as above.
Mortality information was solicited from each of the households visited in the cluster while household, child and maternal anthropometric data was only collected from households with children aged 6-59 months. In case the chosen direction did not yield the required number of children, the team went back to the centre of the cluster and selected another direction to follow until the required number of children was obtained. In the last household all the children within the defined parameter were included in the survey even if the minimum 21 children had already been obtained. A total of 765 eligible under fives

[5] Data obtained from the District development Office(DDO) Mandera Central
[6] The highest C.I of the past mortality rates (2010 nutrition survey)

and 367(eligible women (15-49 years) were covered from 770 households.

3.5 Data collected

The interactive interviewing method was used to collect quantitative information using a structured questionnaire adapted from the Kenya National Guidelines for Nutrition Assessments. The data collected included household demographic information, under five and childcare givers' anthropometry, morbidity, immunization, vitamin A supplementation, water and sanitation, food aid, food security indicators, sources of livelihood, Malaria, coping strategies and retrospective mortality.

3.5.1 Children's data

Anthropometry
Age was determined using health cards and recorded in months. A local calendar of events was developed and used to assist mothers recall their children's age in the absence of health cards.
Height was measured in centimetres using child height boards with 0.1cm precision. Height was measured for children above 87cm and recumbent length for those below 87cm
Weight: Children were measured using the 25kg Salter hanging scale with 0.1kg precision. All children were weighed with minimal clothing and no shoes.
Bilateral oedema: The presence of bilateral pitting oedema was assessed for all children, by applying minimal pressure on the dorsal side of both feet for at least 3 seconds. If the pit remained after removing the pressure, the outcome was considered to be positive.
Mid-upper arm circumference: The Mid-Upper Arm circumference (MUAC) was measured at the mid-point of the left upper arm (precision of 0.1 cm), using standard MUAC tapes for children and adults. .

Vaccination and micronutritient supplementation and coverage
Measles vaccination: assessed by checking for measles vaccination on EPI cards and/or verbal confirmation from the caretakers.
OPV 1 and 3*:* assessed by asking if the child received vaccination on the thigh with polio drops at 6 weeks and 14 weeks as well as confirmation from EPI cards.
BCG vaccination: assessed by checking for the characteristic BCG scar on the child's left arm.
Vitamin A supplementation: assessed by asking caretakers if the child had received a Vitamin A supplement in the last 6 months. A sample of Vitamin A capsules (red/blue) was shown to aid in recall.
Deworming: assessed by asking whether the child had received antihelminthes in the last 3 months.

Retrospective morbidity of children
Caretakers were asked for episodes of illness in the last 2 weeks (14 days) prior to the survey. The cause of illness and whether assistance had been sought was recorded. The following case definitions were used:

- Malaria (fever with chills);
- Diarrhea (watery stool >3/24H);
- Respiratory infection (fever with difficulty breathing or cough);
- Measles (fever with red rash);
- Other (specify);
- None

3.5.2 Mortality data

Retrospective mortality data was collected using the current household census method in all the visited households, including those with no children aged less than five years old. The recall period was 115 days starting from Idd ul Hajj (Nov 16th 2010). Information was collected on the age and sex of the household members, their residence status, the number of household members present within the recall period, the number of persons who arrived or left, and the number of births and deaths over the recall period. The presumed causes of death were recorded based on the following case definitions:

- Diarrhea (watery stool >3/24H);
- Bloody diarrhea;
- Measles (fever with rash);
- Fever;
- Lower respiratory tract infection (fever, cough, chest pin, difficulty breathing);
- Malnutrition;
- Injury;
- Other (specify);
- Unknown;

3.5.3 Causes data

Household questionnaires adapted from the national guidelines on nutrition assessments were used to gather data on causes of malnutrition. This data included:

- General food distribution
- Water and sanitation
- Maternal nutritional status
- Health care seeking patterns
- Sources of income and food
- Food consumption and dietary diversity
- Mosquito net coverage

Useful sources of secondary information particularly concerning the most current situation was the Arid lands Resource management project (ALRMP) Drought Monthly bulletins and the monthly DSG meeting attended by administrative and public health officials. The information gathered was triangulated to establish patterns, trends and relationships and formed the basis for discussion.

3.6 Training and supervision

The survey was conducted by five teams each team comprising of one team leader, two measurers and one interviewer. The following also participated in the survey: Ministry of health (3 people), ALRMP (3 people) and the district development office (1 person). A four days training was conducted and the topics covered included;

- Survey objectives
- Basic principles of nutrition
- Causes of malnutrition.
- Taking and recording anthropometric measurements
- Assessment of Oedema
- Sampling procedures
- practice in taking anthropometric measurements
- community entry behaviour
- research ethics (the do's and don'ts of the survey)
- Standardization test.

The teams pre-tested the questionnaire and sampling methodology in Makutano location

(not among the sampled clusters) on 4th March where each team interviewed 2 households under the supervision of the two Save the Children Nutrition officers and the district nutritionist after which the whole team met for feedback and sharing of fieldwork experience.

3.6.1 Data Quality Control

In order to ensure that quality data was collected, the following measures were taken:

- The teams were thoroughly and adequately trained for 4 days including the pre-test.
- A standardization test was undertaken where each of the enumerators took both weight and height for 10 children each 2 times and their measurements compared with those of their supervisors. The results of the test were used to identify weak measurers and retraining was done.
- All the enumerators participated in the pre-test under the close supervision of the supervisors and thereafter adjustments were made to the tools and corrections made on any errors identified.
- Daily standardization of the weighing scales with a known weight (1kg salt).
- Supervision of each of the teams by the supervisors and team leaders during data collection
- Questionnaires were checked by the team leaders before leaving the household for consistency and completeness
- Triangulation and validation of information using secondary data
- Taking measurements for all under fives in the household to avoid bias in selecting one of them

3.7 Data Entry and Analysis.

Anthropometric and mortality data entry and analysis was conducted using ENA for SMART software version November 2008. The food security data, Water and sanitation, malaria, coping strategy, analysis was done on Excel spread sheet and EPI INFO 1.3.5 setup.

3.8 Nutritional indices

The following indices and cut-off points were used in this survey:

Acute Malnutrition Indices:

Weight-for-height (WFH) index
Acute malnutrition rates are estimated from the weight for height (WFH) index values and survey to the WHO references and are reflective of current nutritional conditions.
WFH indices were expressed in Z-scores as follows;

Table 5: Acute malnutrition indicators

	WFH z-score
Global Acute Malnutrition	< -2 SD and/or oedema
Moderate Acute Malnutrition	< -2 SD and ≥ -3 SD
Severe Acute Malnutrition	< -3 SD and/or oedema

Global acute malnutrition (GAM) is therefore defined as 'the proportion of children presenting with a weight for height index less than -2 Z scores and/or oedema'

Mid-Upper Arm Circumference (MUAC)
MUAC, like weight for height, is used to quantify wasting in a population.

The guidelines used were as follows:

MUAC < 11.5 cm	severe malnutrition and high risk of mortality
MUAC ≥ 11.5 cm and <12.5cm	moderate malnutrition
MUAC ≥12.5 and < 13.5 cm	moderate risk of malnutrition
MUAC ≥ 13.5 cm	satisfactory nutritional status

Table 6: Maternal MUAC cut off points

Nutritional status	
Normal	≥ 21.0cm
Moderate malnutrition	< 21.0cm
Severe wasting	< 18.5cm

Chronic Malnutrition Index:

Height-for-Age (HFA) - Stunting
Chronic malnutrition rates are estimated from the height-for-age (HFA) index values. The HFA indices were compared with WHO references and are reflective of long-term malnutrition. HFA indices are expressed in Z-scores.

Table 7: HFA indices

	Height for Age z-score
Global Chronic Malnutrition	<-2 SD and/or oedema
Moderate Chronic Malnutrition	<-2 SD and ≥ -3 SD
Severe Chronic Malnutrition	<-3 SD and/or oedema

Global chronic malnutrition is therefore defined as 'the proportion of children presenting with a height for age index less than -2 Z scores.

Weight-for-Age (WFA)-Underweight
WFA is a composite index that reflects both wasting and stunting. The WFA indices were compared with WHO references. WFA indices are expressed in Z-scores.

Table 8: WFA indices

	Weight for Age z-score
Global Underweight	<-2 SD and/or oedema
Moderate Underweight	<-2 SD and ≥-3 SD
Severe Underweight	<-3 SD and/or oedema

Mortality Indices
The crude mortality rate (CMR) is determined for the entire population surveyed for a given period. The CMR using the current census method is calculated as follows:

$$\text{CMR} = \frac{10{,}000 \text{ people}}{\text{Number of recall days}} \times \frac{\text{number of deaths during recall}}{\text{Number of current residents}} = \text{Deaths/10,000/day}$$

$$+1/2 \text{ (No. of deaths during recall)}$$
$$-1/2 \text{ (No. of births during recall)}$$

The proportion of deaths among children under-five years of age (U5MR) is also calculated the same way using the under five population data. The thresholds are defined as follows:

Table 9: Mortality Thresholds

	Total population CMR	Under-five population U5MR
Alert level:	1/10,000 people/day	2/10,000 children/day
Emergency level:	2/10,000 people/day	4/10,000 children/day

3.9 Survey data validation process

During data analysis, Nutrisurvey for SMART software flagged any missing data, extremes or potentially incorrect z-scores values. All flagged off Z-scores were excluded from the analysis. A triangulation of information was done to verify the findings of the quantitative data; information was collected through key informants,focus group discussions, secondary data and observation.

Presentation of the survey results were made both at the Food security technical sub DSG for Mandera central and later at the nutrition Information working group meeting where the results were validated.

4 RESULTS

4.1 Survey sample description

Table 10: Summary of the Survey sample

Number of children 6-59 months surveyed	765
Number of children 6-59 months analysed by WHO	759
Number of children 6-59 months analysed by NCHS	761
Number of total population surveyed for mortality	5009
Number of children under five surveyed for mortality	1098
Number of HH covered in the mortality survey	770
Number of persons who joined the household during the recall period	95
Number of persons who left the household during the recall period	70
Number of under five children who joined the household during the recall period	15
Number of under five children who left the household during the recall period	13
Number of births during the recall	78
Average Number of persons per HH	7
Average Number of children per HH	1.4
% of children under five in the population	21.9%

4.2 Anthropometric results (based on WHO 2006)

Table 11: Acute Malnutrition definitions

	WFH z-score	*MUAC*
Global acute malnutrition	<-2 SD and/or oedema	<12.5 CM and/or Oedema
Moderate acute malnutrition	≥-3 SD to < -2 SD	≥11.5cm to <12.5cm
Severe acute malnutrition	<3 SD and/or oedema	<11.5cm and /or oedema

Table 12: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17 months	84	58.3	60	41.7	144	18.8	1.4
18-29 months	84	51.5	79	48.5	163	21.3	1.1
30-41 months	110	50.9	106	49.1	216	28.2	1.0
42-53 months	78	50.3	77	49.7	155	20.3	1.0
54-59 months	41	47.1	46	52.9	87	11.4	0.9
Total	397	51.9	368	48.1	765	100.0	1.1

Figure 2: Population age and sex pyramid

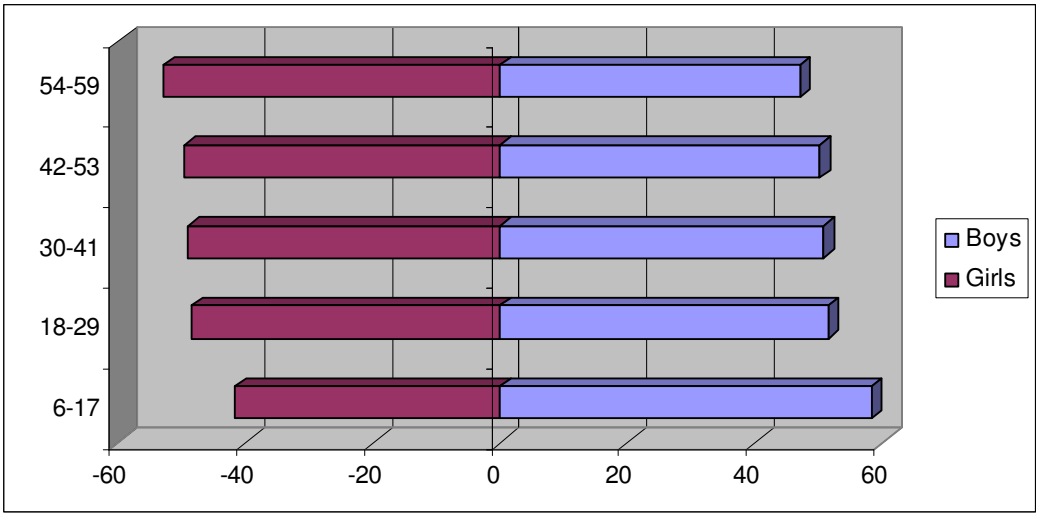


Table 13: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 759	**Boys** n = 396	**Girls** n = 363
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(209) 27.5 % (23.3 - 32.2 95% C.I.)	(121) 30.6 % (25.3 - 36.4 95% C.I.)	(88) 24.2 % (19.6 - 29.6 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(184) 24.2 % (20.1 - 28.9 95% C.I.)	(106) 26.8 % (21.7 - 32.6 95% C.I.)	(78) 21.5 % (16.8 - 27.1 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(25) 3.3 % (2.3 - 4.8 95% C.I.)	(15) 3.8 % (2.4 - 6.0 95% C.I.)	(10) 2.8 % (1.3 - 5.8 95% C.I.)

Prevalence of oedema was 0.0 %

Table 14: Prevalence of acute malnutrition by age based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		**Moderate wasting (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mths)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	142	4	2.8	15	10.6	123	86.6	0	0.0
18-29	162	2	1.2	35	21.6	125	77.2	0	0.0
30-41	214	10	4.7	42	19.6	162	75.7	0	0.0
42-53	154	7	4.5	48	31.2	99	64.3	0	0.0
54-59	87	2	2.3	44	50.6	41	47.1	0	0.0
Total	759	25	3.3	184	24.2	550	72.5	0	0.0

Table 15: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 26 (3.4 %)	Not severely malnourished No. 739 (96.6 %)

The figure below shows the weight for height distribution curve of the survey sample in Z-scores. The weight for height distribution curve of the sample is shifted to the left, with a mean Z-score of -1.22±1.20, which indicates a suboptimal nutrition status compared to the reference population (WHO reference table).

Figure 3: Comparative graph of GAM and WHO 2006 Reference Population

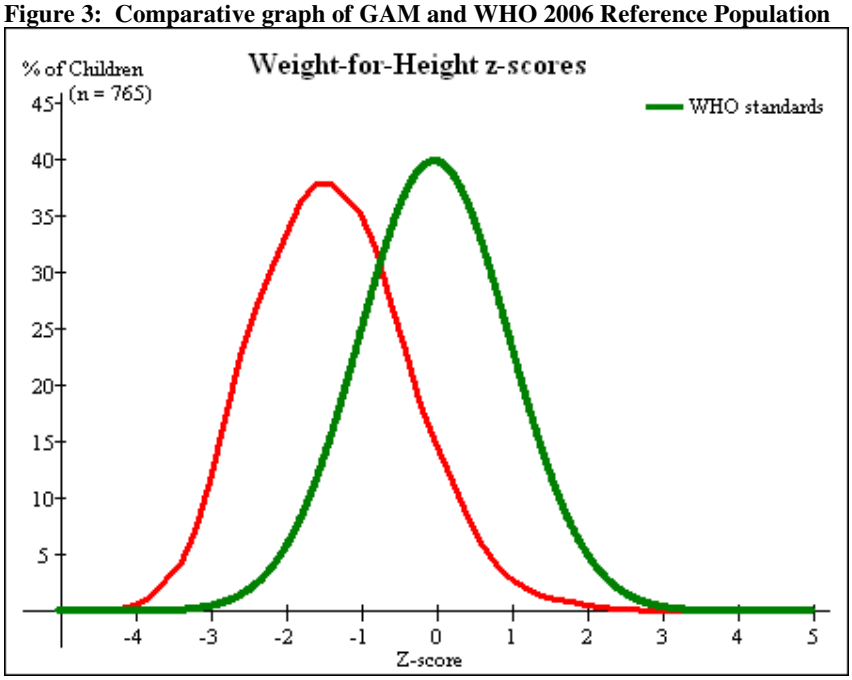


Table 16: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 765	Boys n = 397	Girls n = 368
Prevalence of underweight (<-2 z-score)	(297) 38.8 % (32.8 - 45.2 95% C.I.)	(153) 38.5 % (32.0 - 45.5 95% C.I.)	(144) 39.1 % (31.8 - 46.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(237) 31.0 % (26.3 - 36.1 95% C.I.)	(124) 31.2 % (25.9 - 37.1 95% C.I.)	(113) 30.7 % (24.8 - 37.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(60) 7.8 % (5.7 - 10.7 95% C.I.)	(29) 7.3 % (4.7 - 11.2 95% C.I.)	(31) 8.4 % (5.6 - 12.4 95% C.I.)

Table 17: Prevalence of underweight by age, based on weight-for-age z-scores and oedema

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mths)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	144	11	7.6	28	19.4	105	72.9	0	0.0
18-29	163	17	10.4	60	36.8	86	52.8	0	0.0
30-41	216	22	10.2	70	32.4	124	57.4	0	0.0
42-53	155	8	5.2	46	29.7	101	65.2	0	0.0
54-59	87	2	2.3	33	37.9	52	59.8	0	0.0
Total	765	60	7.8	237	31.0	468	61.2	0	0.0

Table 18: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 765	**Boys** n = 397	**Girls** n = 368
Prevalence of stunting (<-2 z-score)	(156) 20.4 % (15.7 - 26.1 95% C.I.)	(80) 20.2 % (14.9 - 26.7 95% C.I.)	(76) 20.7 % (15.6 - 26.9 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(123) 16.1 % (12.1 - 21.0 95% C.I.)	(67) 16.9 % (12.2 - 22.8 95% C.I.)	(56) 15.2 % (11.5 - 19.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(33) 4.3 % (2.9 - 6.3 95% C.I.)	(13) 3.3 % (1.7 - 6.2 95% C.I.)	(20) 5.4 % (3.4 - 8.6 95% C.I.)

Table 19: Prevalence of stunting by age based on height-for-age z-scores

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mths)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	144	5	3.5	24	16.7	115	79.9
18-29	163	8	4.9	33	20.2	122	74.8
30-41	216	13	6.0	37	17.1	166	76.9
42-53	155	7	4.5	17	11.0	131	84.5
54-59	87	0	0.0	12	13.8	75	86.2
Total	765	33	4.3	123	16.1	609	79.6

Table 20: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	759	-1.38±0.98	1.83	0	6
Weight-for-Age	759	-1.54±0.99	2.60	0	6
Height-for-Age	745	-1.13±1.22	2.46	0	20

* contains for WHZ and WAZ the children with oedema.

Table 21: Plausibility Checks for Anthropometric Data

Indicator	Survey
Digit preference weight	2 (7)
Digit preference height	4 (11)
WHZ (Standard deviation)	0 (0.98)
WHZ (Skewness)	0 (0.25)
WHZ (Kurtosis)	0 (-0.16)
Percentage of flags	0.8%
Age ratio: ages 6-29: 30-59	0.67

Overall sex ratio: p = 0.294 (boys and girls equally represented)
Overall age distribution: p = 0.000 (Significant difference)
Overall age distribution for boys: p = 0.096 (as expected)
Overall age distribution for girls: p = 0.002 (significant difference)
Overall sex/age distribution: p = 0.000 (significant difference
Overall data quality of survey is 16% this is unacceptable.

Table 22: Child nutritional status according to MUAC

Nutritional Status	MUAC Criteria	number	Percentage
Severe Malnutrition	<11.5cm	7	0.9%
Moderate Malnutrition	≥11.5cm-<12.5cm	42	5.5%
At Risk of Malnutrition	≥12.5cm-<13.5cm	156	20.4%
Well Nourished	>13.5	560	73.2%
TOTAL		765	100%

Table 23: Maternal nutrition status according to MUAC

MUAC cm	Frequency	Percent
<21	33	9.0%
21-22.9	90	24.5%
>23	244	66.5%
Total	367	100.0%

4.3 MORTALITY RESULTS

The recall period for the survey was 115 days starting from IDD ul Hajj (16th of November 2010).

Table 24: Mortality rates

CMR (total deaths/10,000 people / day): **0.35** (0.20-0.63) 95%CI
U5MR (deaths in children under five/10,000 children under five / day): **0.83** (0.37-1.87) 95%CI

Table 25: Causes of death

	Cause of death	<five years N=8	>five years N=6
1	Diarrhoea	1(12.5%)	0
2	TB	0	1(16.7)
3	Snakebite	0	1(16.6%)
4	Fever	1(12.5%)	1(16.6%)
5	LRTI	1(12.5%)	1(16.6%)
6	Malnutrition	0	0
7	Accident	0	1(16.6%)
8	Other		0
9	Unknown	5(62.5%)	1(16.6%)

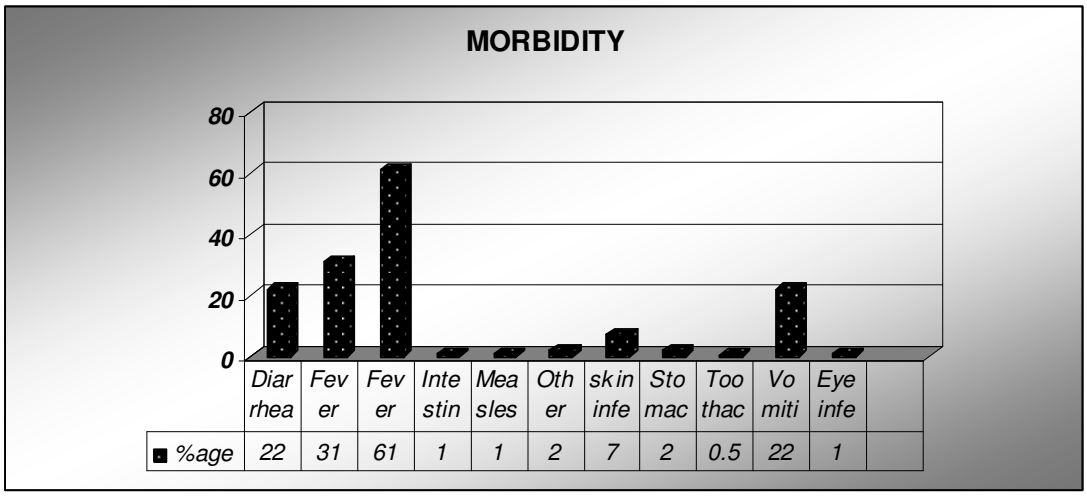
Three of the children who died of unknown causes were under 1 month old.

4.4 CHILD MORBIDITY

Table 26: Prevalence of reported illness in children in the two weeks prior to interview (n=765)

	6-59 months
Prevalence of reported illness	(212) 27.7%

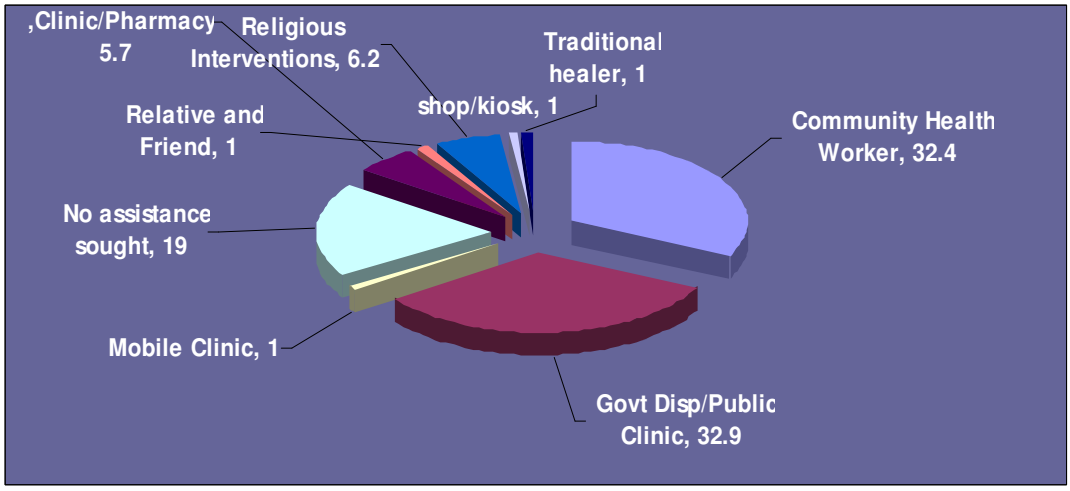
Figure 4: Symptom breakdown of reported illness in children two weeks prior to interview (n=212)



Health seeking patterns

Almost an equal number of people went to seek medical attention from government dispensaries (32.9%) as did from community health workers (CHW) (32.4%). This shows how key CHWs are in provision of care in the district. Another 5.2% of the respondents sought care from private clinics or pharmacies, 6.2% went for religious interventions while 19% did not seek any medical care.

Figure 5: Type of assistance sought



4.5 VACCINATION RESULTS

The figure below indicates the vaccination coverage based on information from the child welfare cards and caretakers recall. The coverage for measles was 96.4%, Pentavalent/OPV 1 98.9%, pentavalent/OPV3 97.2%, and BCG 93.7%. Vitamin A supplementation coverage was 66.3%.

Figure 6: Vaccination coverage and vitamin A supplementation

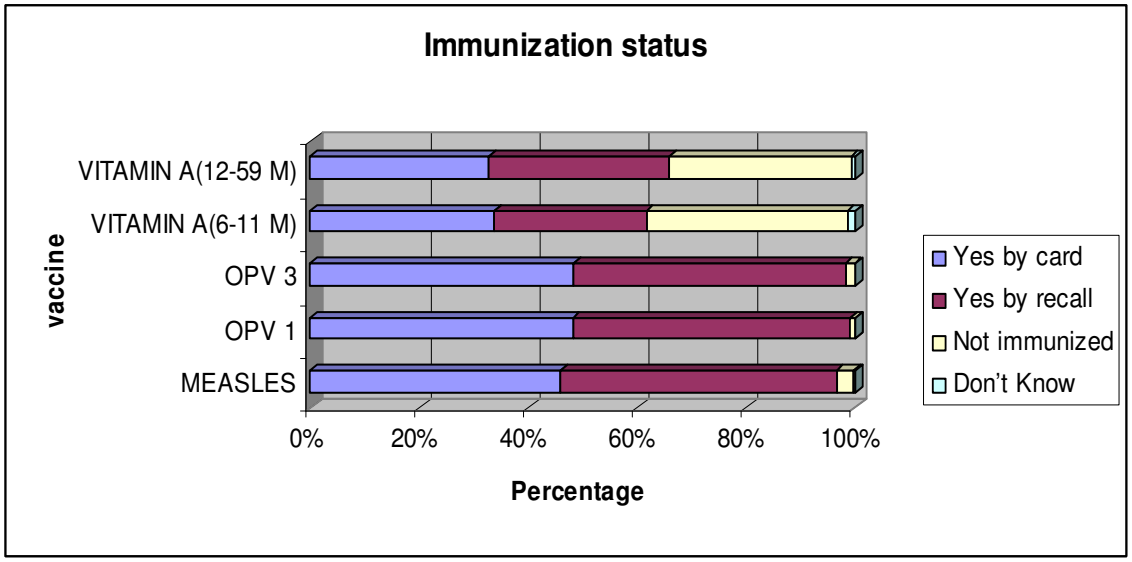


Figure 7: BCG and De-worming coverage

BCG SCAR [N= 968]	Present	(717) 93.7%
	Absent	(48) 6.3%
De-worming	Yes	(47) 6.1%
	No	(710) 92.8%
	Don't know	(8) 1%

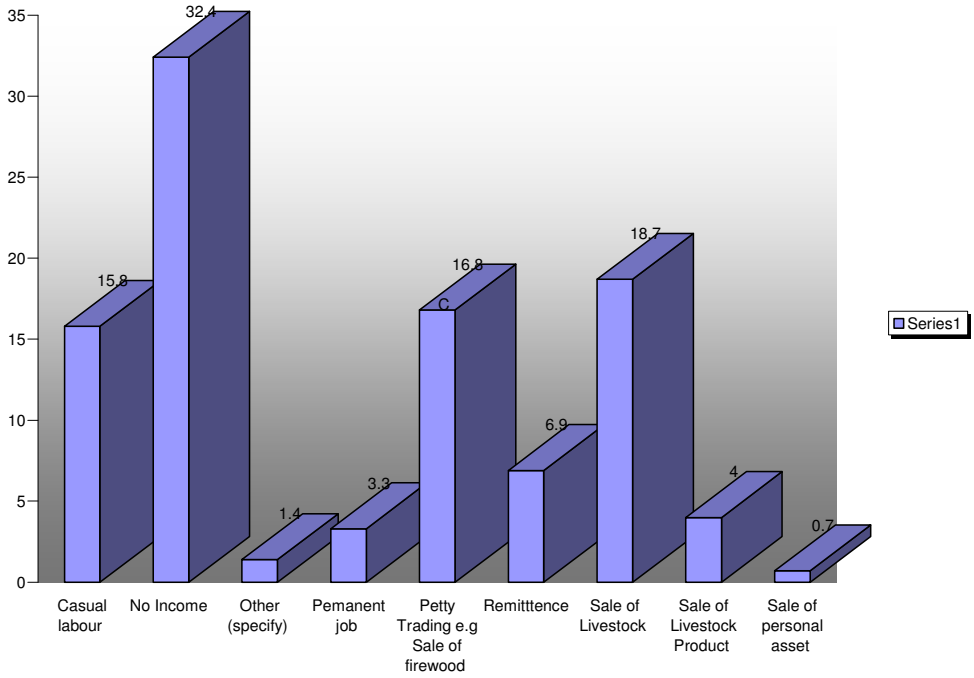
4.6 FOOD SECURITY AND LIVELIHOOD

The survey outcome indicated that the main three livelihood activities of the caretakers interviewed were livestock herding (22.7%), wage/casual labour (18.4%) and house wives (37%).

Main source of income

The chart below presents the sources of income in assessed areas. The most reported sources of income included sale of livestock and livestock products, casual labour and petty trade. Most of the respondents (32%) reported to not having any source of income.

Figure 8: Current sources of income



Sources of food

The main sources of food were given as food aid (54.6%) and purchases (41.8%). Of those interviewed, 93.1% said that their current food sources were not sufficient with a similar percentage reporting to have depleted their food sources at the time of the survey. The reasons given for insufficiency included low purchasing power (62%), increased food prices (26%), drought (22%) and loss of livestock (15.1%).

Food aid was received by 93.4% of the households interviewed with 90.5% receiving from World Food programme (WFP) through the lead agency Consortium of Cooperating partners (COCOP) while the rest had received from the office of the president. The food commodities received from WFP were as shown in the table below.

Table 27: Food aid commodities received in the last distribution

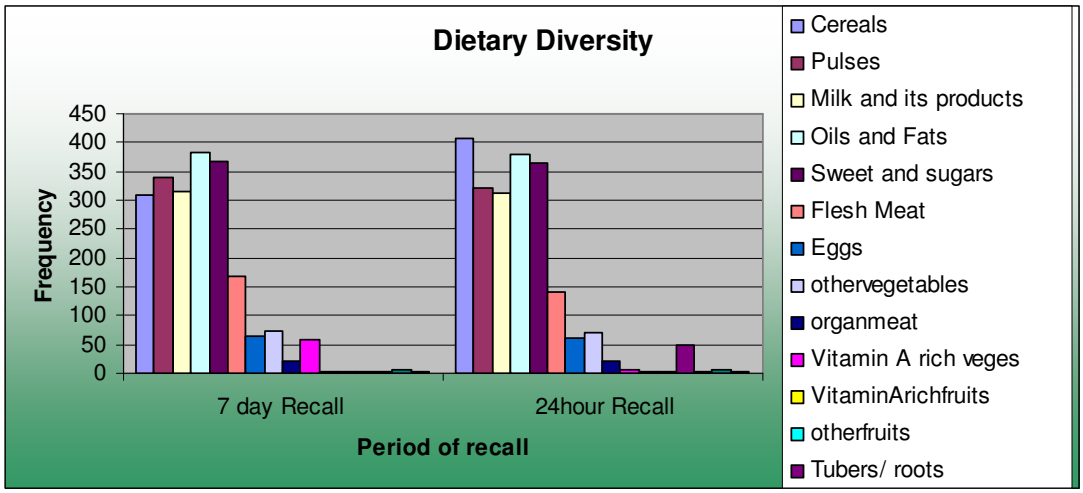
Foods received	Frequency (N=423)	Percent
CSB	332	78.5%
Cereals	310	73.3%
Oil	322	76.1%
Pulses	189	44.7%
Salt	126	29.8%

From the table above it appears that not all households received the complete food basket with only 44.7% receiving pulses and 29.8% receiving salt.
In 91.7% of the households receiving food aid, the food was consumed by the household members whilst 3.5% was shared and 0.2% was battered for other commodities. A majority of the respondents (78.4%) said that the food aid lasted for one week on average

while 14.8% said that it lasted for 2 weeks with 1.9% of the respondents saying that it lasted for 4 weeks.

Dietary diversity

Figure 8: Dietary Diversity (7 days and 24 Hour recall)

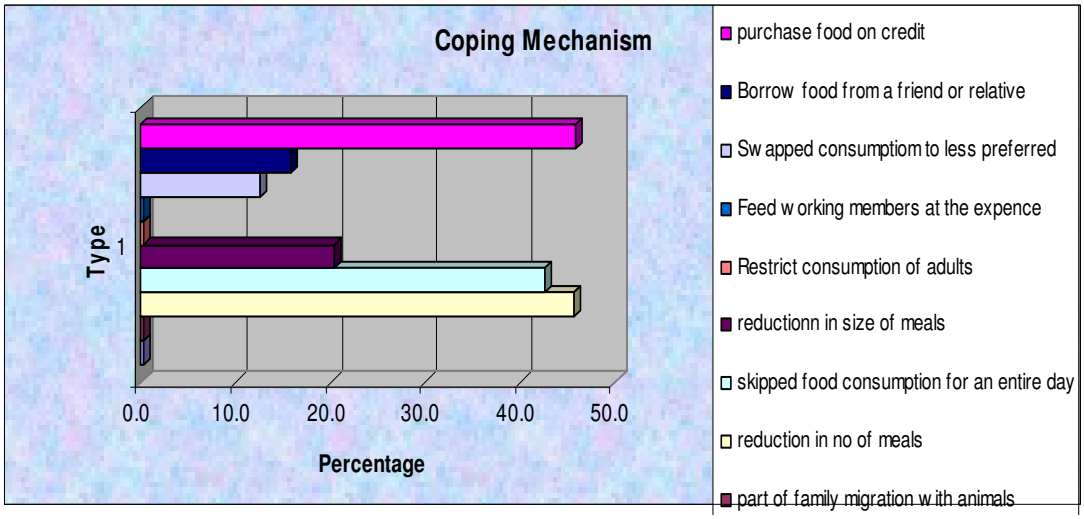


Cereals, oils and fats, sugar, pulses and milk and its products account for the main foods consumed by households.

Household coping strategies

Of the households interviewed, 94.3% reported that they had experienced an incident in the last 6 months that affected their usual ability to eat and/or buy food of the quality, quantity or variety they preferred compared to 43.9% reporting the same in 2010. This could be an indicator that more households are expressing stress related to the current drought situation. The figure below represents some of the coping mechanisms employed by the households.

Figure 9: Coping strategies



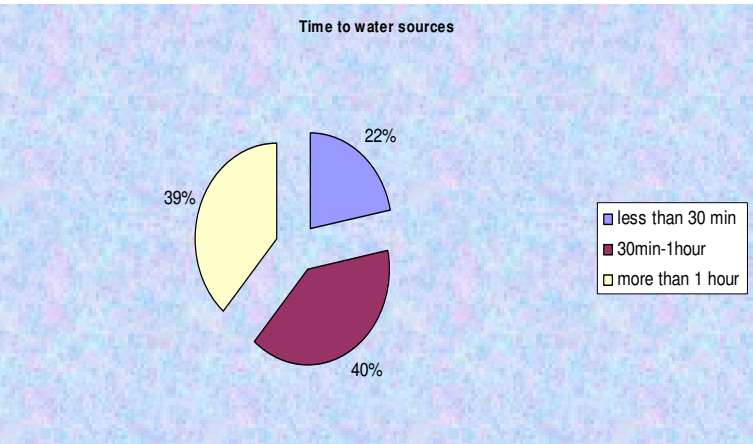
4.7 WATER AND SANITATION

Current main water source

The main water source reported was borehole (52%), followed by protected well (22%) and water tankering (16%). The survey was undertaken during an extended dry spell with the failure of the 2010 short rains that were expected in Oct/Nov.

Only 22% of the households took less than 30 minutes to fetch water and return home with 40% taking between 30 minutes to 1 hour and 39% taking more than one hour.

Figure 10: Time taken to fetch water



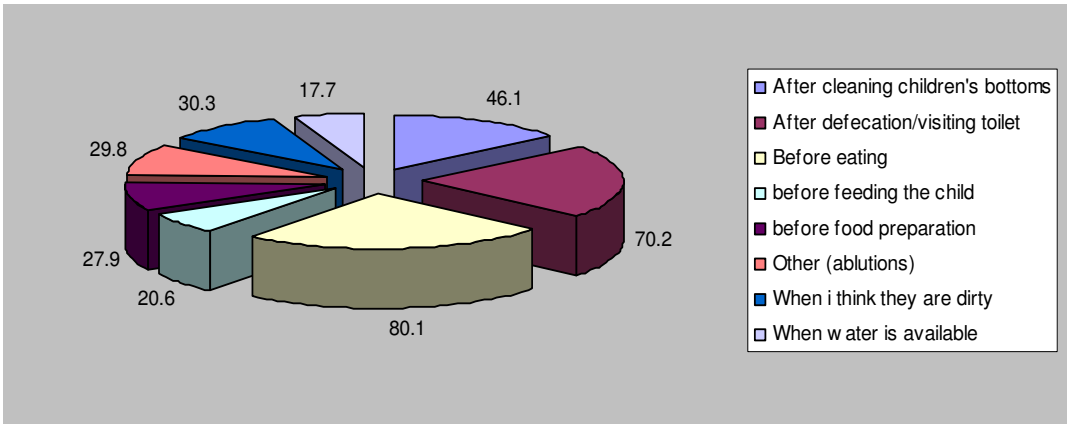
Water treatment practices are very poor with 98.8% of the households reporting that they do not do anything to the water before drinking.

Toilet Utilization

Slightly over half (50.8%) of the respondents reported to having access to a toilet facility and most of them (94.7%) said the type of toilet was a traditional pit latrine. For the respondents that did not have access to a toilet facility (49.2%), most of them said that they defecated in the bush or open field. The children's faeces were reported to be disposed in the open field/bush by the majority of the respondents.

Hand washing practices

Figure 11: Hand washing times



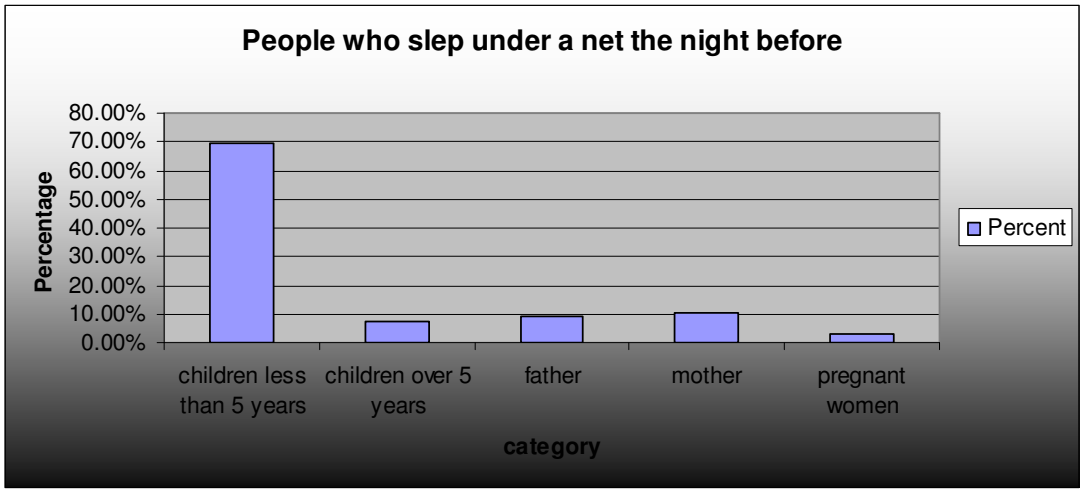
Most of the respondents reported to have washed their hands especially before eating (80.1%), after visiting the toilet (70.2%) and after washing baby bottoms (46.1%). Majority

(87%) of the respondents washed their hands using water only while only 12% washed their hands using water and soap.

Mosquito Net coverage

Mosquito net coverage was 17.7%. Of those that had the mosquito nets, 50.8% reported to have bought it from a shop, and 31.5% got it from agencies/ NGO while the remaining 17.8% had been given through the Ministry of Health.

Figure 12: Categories of people who slept under a mosquito net the night prior to the survey



5 Discussion

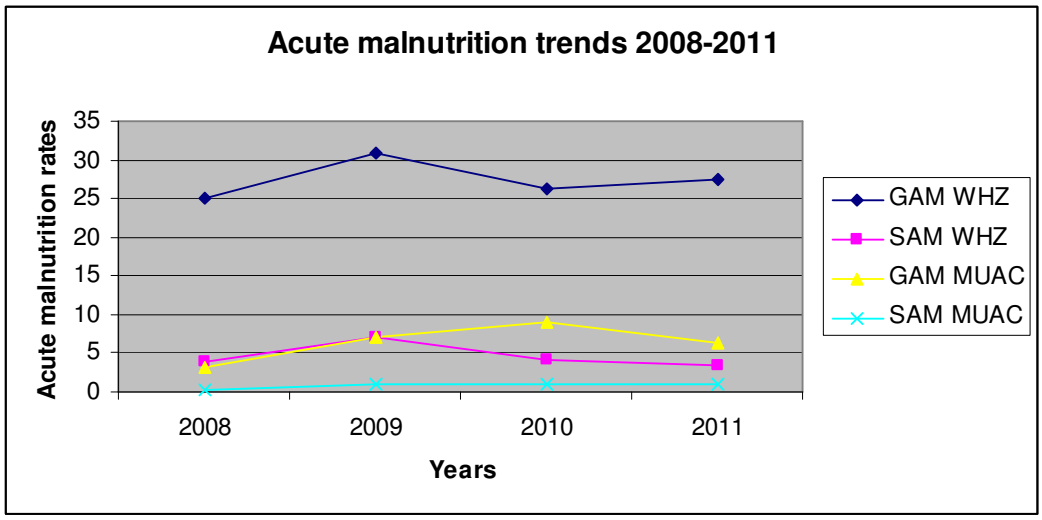
The overall male/female ratio was 1.1, which fell within the acceptable range of 0.8-1.2[7]. There were slightly more boys than girls in the 6-17 months age group making it slightly out of range and this may have been due to bias in collecting age information which was largely done by use of the events calendar. Overall the age distribution demonstrates an unbiased survey sample.

The global acute malnutrition (GAM) rate was 27.5% (23.2-32.2 95% CI) and severe acute malnutrition (SAM) rate of 3.3% (2.3-4.8 95% CI). There were slightly more boys (30.6%) malnourished than girls (24.2%) though not statistically significant. The GAM rates indicate a slight increase as compared to the rates in 2010 of GAM 26.2% (23.1-29.6 95% CI) and SAM 4.2% (3.2-5.6 95% CI). Based on the CDC probability calculator, there is only a 36.3% chance that the two surveys are different.
The Mid upper arm circumference MUAC is a good predictor of the risk of mortality and GAM according to MUAC was 6.4% as compared with GAM of 8.9% in 2010 which indicates a slight improvement which also compares well with the slight reduction in SAM from 4.2% in 2010 to 3.4% in 2011.

As indicated in figure 13 below, the nutrition surveys conducted over time have been undertaken during the same season in the same locations and as shown, the graph indicates a typical pattern for the season. The year 2009 had the highest rates of malnutrition due to a combination of failed rains, high food prices and heightened insecurity that affected access to food and health care.

[7] Claudine Prudhon (Action Against Hunger, 2002). Assessment and Treatment of Malnutrition in Emergency Situations

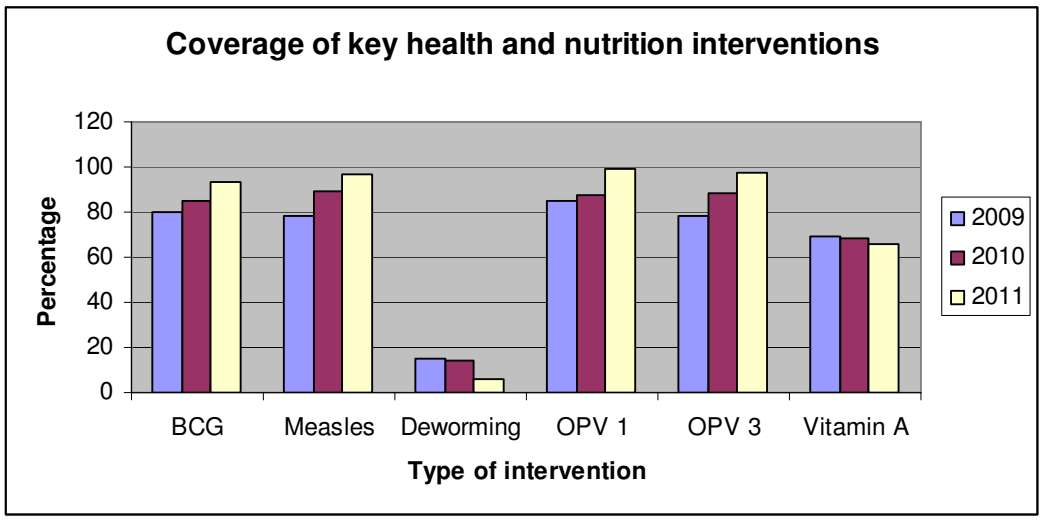
Figure 13: Acute malnutrition trends



Both the crude and under five mortality rates remain below emergency thresholds at CMR of 0.35deaths/10,000/day and U5MR of 0.83/10,000/day.

The vaccination coverage indicates an improvement as compared to other years with most of the vaccinations above 80%, the nationally recommended rates. A lot of the improvement is due to vaccination campaigns during malezi bora and outreach activities that have been supported by NGOs.

Figure 14: Coverage of key health and nutrition interventions



Despite the achievements made in ensuring good immunization coverage, the coverage of some high impact nutrition interventions like de-worming and vitamin A supplementation have not indicated any improvements and there is need to ensure that these are scaled up using the strategies that have been put in place to ensure good immunization coverage. It is also worth noting that just before the survey, there was a measles campaign that had been undertaken and this may have boosted the measles coverage.

The main livelihood activity is pastoralism and as the drought situation persists, there is a likelihood that some livelihoods will be destroyed leaving some people destitute. At the time of the survey, there was a lot of migration in search for pasture and water and the

livestock body conditions had started deteriorating with some deaths being reported. As the body conditions worsen, prices reduce in the market and this in turn affects income and people's purchasing power and especially the ability to purchase food.

Most of the surveyed populations rely heavily on food aid as their main source of food and there is need to continue strengthening the food aid pipeline to ensure continued access to food as other interventions are put in place to strengthen livelihoods and resilience to the frequent droughts.

The water and sanitation situation is worrying due to the poor toilet usage rates and the high susceptibility to diarrheal diseases due to the poor hand washing and drinking water treatment practices.

6 Conclusion

Both the GAM and SAM rates are high and typical for the hunger gap season, during which this survey was undertaken. However, given the failure of the short rains in 2010 and the prediction of an even poorer rain performance during the 2011 long rains expected to start in April, there are prospects of rapid increase in malnutrition rates. The food prices continue to rise and given that a majority of the population relies on food aid which only lasts on average two weeks and have to purchase food for the rest of the month, food security at household level is likely to be further compromised.

7 Recommendations

Health and Nutrition

Immediate

- Scale up community mobilization activities in order to provide early detection and referral of the acutely malnourished
- Continue implementing the IMAM programme and where applicable start up new outreach sites.
- Promote use of insecticide treated mosquito net.
- Implement mass campaigns to improve Vitamin A and De-worming coverage (including targeting Early Childhood Development centers (ECDC)
- Preventive health care measures to reduce diseases which exacerbate malnutrition (Diarrhoea and malaria) e.g. accelerated health education
- Increase Public Health Promotion programs to distribute PUR sachets, Aqua tabs, soap, jerry cans, mosquito nets

Medium term

- Continued health outreach in locations inaccessible to health facilities to offer basic primary health care package
- Focused Health promotion and nutrition education including Infant and Young Child Feeding (IYCF) including diet diversity)
- Integrated health, nutrition and food security programming to address underlying causes
- Strengthen continuous nutrition surveillance through regular nutrition surveys, Programme coverage assessments and MUAC screening.

Long term

- Food security and Livelihood interventions (including disaster reduction and resilience)
- Viable WATSAN interventions

MANDERA CENTRAL DISTRICT NUTRITION SURVEY QUESTIONNAIRE
CHILDREN 6-59 MONTHS (ONE SHEET PER CLUSTER)

Name of Division	Name of Village	Cluster No	Team No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
				____/____/____		

1.1 HH No.	1.2 Child ID	1.3 Age in Months	1.4 Sex 1=Male 2=Female	1.5 MUAC to the nearest 0.1 cm	1.6 Oedema in both feet? 1=Yes 2=No	1.7 Height to nearest 0.1 cm	1.8 Weight to nearest 0.1kg	1.9 Is the child currently enrolled in a feeding program? (Confirm by a card if the child is currently enrolled) 1=yes(OTP) 2=yes (SFP) 3=Yes (TFC) 3=No 4=Don't know	1.10 Has the child received measles immunization? 1=Yes (by card) 2=Yes (by recall) 3=No 4=Don't know	1.11 Has child received pentavalent 1/OPV 1? 1=Yes (by card) 2=Yes (by recall) 3=No 4=Don't know	1.12 Has child received pentavalent 3/OPV 3? 1=Yes (by card) 2=Yes (by recall) 3=No 4=Don't know	1.13 Has the child received Vitamin A in the last 6 months? (Show the mother the capsule so that she recalls or understand). 1=Yes (by card) 2=Yes (by recall) 3=No 4=Don't know	1.14 BCG scar present? 1=Yes 2=No	1.15 Has the child been dewormed in the last 3 months? 1=Yes 2=No 3= Don't know	1.16 Has the child been sick in the last 2 weeks? 1=Yes 2=No	1.17 If YES, what was the child suffering from? (More than one response possible) 1= Diarrhea 2=Vomiting 3=Fever with chills like malaria 4=Fever, cough, difficult in breathing 5=Intestinal Parasite 6= Measles 7=Eye infections 8=Skin infections 9= Accident 10=Malnutrition 11=Stomachache 12=Toothache 13=other (specify)	1.18 When the child was sick where did you seek assistance? (More than one response possible) 1=Traditional healer 2=Community health worker 3=Private clinic/ pharmacy 4=Shop/kiosk 5=Public clinic 6=Mobile clinic 7=Relative or friend 8=No assistance sought

ILLNESS: 1= Malaria (fever with chills) 2= Diarrhoea (watery stool>3/24Hrs) 3= Respiratory Infection (fever, difficulty breathing or cough) 4= Measles (fever with red rash) 5= Other (specify) 6= None

1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	1.11	1.12	1.13	1.14	1.15	1.16	1.17	1.18

ILLNESS: 1= Malaria (fever with chills) 2= Diarrhoea (watery stool>3/24Hrs) 3= Respiratory Infection (fever, difficulty breathing or cough) 4= Measles (fever with red rash) 5= Other (specify) 6= None

MANDERA CENTRAL DISTRICT NUTRITION SURVEY MORTALITY QUESTIONNAIRE (ONE SHEET PER HOUSEHOLD)

Name of Division	Name of Village	Cluster No	Team No	HH No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
					____/____/____		

No	Current HH members (Name and ID) **All the HH members who have been in the HH since IDD ul Hajj to date**	Age (Indicate in Months if <5 then circle)	Sex 1=Male 2=Female	Present now in HH (Tick=YES)	In- migration Since **IDD ul Hajj** to date (exclude births) (Tick=YES	Out- migration since **IDD ul Hajj**) to date (exclude deaths) (Tick=YES)	Births since **IDD ul Hajj** to date Tick=YES	Died since **IDD ul Hajj** to date Tick=YES	Cause of death*
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									

SUMMARY DATA SECTION

Current HH members total	
Current HH members <5y	
Current HH members who are males	
Current HH members who are females	
Current HH members in-migration total	
Current HH members in-migration <5y	
Past HH members out-migration total	
Past HH members out-migration <5y	
Deaths total	
Deaths <5y	
Total births	

*CAUSES OF DEATH:
1= Diarrhoea (minimum of 3 watery stools/24hrs)
2= Bloody Diarrhoea;
3= Measles (fever with rash);
4= Fever;
5= Lower respiratory tract infection (fever, productive cough, chest pain, difficulty breathing)
6= Malnutrition;
7= Injury;
8= Other;
9=Unknown

Enumeration data collection form for death rate calculation (one sheet/cluster)

Survey District_____ Village:_____ Cluster number:____ Total HH_____ Date:_____ Team number:_____

N	Current HH member		In- migration since IDD ul Hajj to date (exclude births)		Out- migration since IDD ul Hajj to date (exclude deaths)		Births since (IDD ul Hajj to date	Died since IDD ul Hajj to date	
	Total	< 5	Total	<5	Total	< 5		Total	< 5
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Name of Division	Name of Village	Cluster No	Team No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
				___/___/___		

SECTION 2: FOOD SECURITY AND LIVELIHOODS (ONE SHEET PER CLUSTER)

HH No	2.1 Status of the Household 1=Resident 2=IDP 3=temporary resident 4=Resettled 5=Refugee	2.2 Sex of respondent 1=Male 2=Female	2.3 MUAC (cm) only if the respondent is an adult female **(15 to 49 years)**	2.4 What is your **main** livelihood activity/s? 1=Agricultural labour 2=Livestock herding 3=Own farm labour 4=Employed (salaried) 5=Waged (Casual) 6=Petty trade 7=Unemployed 8=Student 9=Merchant/trader 10=Housewife 12=Domestic help 13=Hunting, gathering 14=Firewood/charcoal 16=handicraft 18=Others (Specify)……	2.5 What is/are your **main** current source/s of income 1=No income 2= Sale of livestock 3= Sale of livestock products 4= Sale of crops 5= Petty trading e.g. sale of firewood 6=Casual labour 7=Permanent job 8= Sale of personal assets 9= Remittance 10=Other-Specify	2.6 Is your **main** source/s of food sufficient for your household? 1=Yes 2= No	2.7 If your answer is NO give reasons for insufficient food sources? **(more than one answer)** 1=Poor harvest (probe why) 2= Livestock Diseases 3=Lack of farm inputs 4=Increased food prices 5=Low purchasing power 6=Other (specify)	2.8 How long will your current food stock last you? 1= already depleted 2= less than a month 3= 1-3 months 4= 4-6 months 5= more than 6 months	2.9 Has your HH received food aid in the last three (3) months? 1 = Yes 2 = No	2.10 If Yes what were the sources? 1=COCOP/WFP 2=Red cross 3=Government 4=Others (specify)	2.11 What food commodities were received 1= CSB 2=Oil 3=Salt 4=Pulses 5=Cereals	2.12 Of the food aid received for what purpose was it used? **(multiple answers allowed)** 1=Resold in the market 2=Bartered for other item 3=Shared with kin 4=Saved for seed 5=Consumed by the HH members 6= Other	2.13 How many days on average did the food commodities last? 1=1 Week 2= 2 weeks 3=3weeks 4= 4 weeks and more	2.14 How many meals on average did children in the HH eat in a day during the last 24 hours? 1= EBF/No child 2 = one 3 = Two 4 = Three 5 = >3 three

Food group consumed:	3.16 Did a member of your household consume any food from these food groups in the **last 7 days?** 1=Yes 2=No	3.17 If yes, how many days was the food consumed in the **last 7 days?**	3.18 Did a member of your household consume food from any these food groups in the **last 24 hours** (from this time yesterday to now)? Include any snacks consumed. 1=Yes 2=No	*Codes: 1= Own production 2=Purchases 3=Gifts from friends/families 4=Food aid 5= traded or Bartered 6=Borrowed 7=Gathering/wild 9= Food vouchers 10=Others, specify_____
Type of food				3.19 What is the main source of the dominant food item consumed? (Use codes above)?
1. Cereals and cereal products *(e.g. sorghum, maize, spaghetti, pasta, caanjera, bread*)?				
2. Vitamin A rich vegetables and tubers: Pumpkins, carrots, orange sweet potatoes				
3. White tubers and roots: White potatoes, white yams, cassava, or foods made from roots				
4. Dark green leafy vegetables: Dark green leafy vegetables, including wild ones + locally available vitamin A rich leaves such as cassava leaves etc.				
5. Other vegetables *(e,g, tomatoes, egg plant, onions)?*				
6. Vitamin A rich fruits: Ripe mangoes, water melon papayas + other locally available vitamin A rich fruits				
7. Other fruits				
8. Organ meat (iron rich): Liver, kidney, heart or other organ meats or blood based foods				
9. Flesh meats and offals: Meat, poultry, offal *(e.g. goat/camel meat, beef; chicken/poultry)?*				
10. Eggs?				
11. Fish: Fresh or dries fish or shellfish				
12. Pulses/legumes, nuts *(e.g. beans, lentils, green grams, cowpeas)*?				
13. Milk and milk products *(e.g. goat/camel/ fermented milk, milk powder)?*				
14. Oils/fats *(e.g. cooking fat or oil, butter, ghee, margarine)?*				
15. Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies				
16. Condiments, spices and beverages:				
1.20 In general what is the <u>main</u> source of food in household? (*Use codes above) [ ]				
1.21 Total number of food groups consumed (filled by enumerator)**:** **[ ]**				

SECTION 3: Food Consumption & Dietary Diversity (ONE sheet per HH)

SECTION 4: WATER, SANITATION AND HYGIENE PRACTICES (ONE SHEET PER CLUSTER)

Name of Division	Name of Village	Cluster No	Team No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
				____/____/____		

HH No.	4.1 What is your household main current water source? 1=River 2=Water tap/water kiosk 3=Borehole 4=Unprotected well 5=Protected well 6=Public pan-'**Drip'** 7=Tanker 8=Dam- '**Harr'** 9=Laga 10=Rain harvest (from the roof) 11=Other (specify)	4.2 What is the total time to and from the current main water source? 1= less than 30 min 2= 30 min- 1 hour 3= More than 1 hour	4.3 What do you do to water before drinking? 1= Nothing 2=Boiling 3=Use of traditional methods 4=Use chemicals 5=filter/sieve 6=decant **(Multiple responses**)	4.4 Does your household have access to a toilet facility? 1=Yes 2= No	4.5 If yes, what type of toilet facility? 1=Traditional pit latrines 2=Ventilated improved pit latrine 3=Flush toilet 4=Other Specify	4.6 If No, where do you go/use? **(probe further**) 1= Bush 2=Open field 3 =Near the river 4 =Behind the house 5 =Other (specify)	4.7 How do you dispose of children's feaces? 1= Bush 2=Open field 3 =Near the river 4 =Behind the house 5=Latrine 6 =Other (specify	4.8 At what times do you wash your hands? **(multiple answers possible)** 1 =After defecation/visiting toilet? 2 = Before feeding the child? 3 = Before eating 4 = Before preparing food 5 = When I think they are dirty 6 = When water is available 7=After cleaning children's bottoms 8= Other (specify)	4.9 What do you use to clean your hands? 1=Water only 2 = Water and soap 3=Water and ash 4=Other (specify)

N/B; Let the respondent answer the questions and only code what they day; do not assume an answer before asking the question

SECTION 5: MALARIA AND COPING STRATEGIES (ONE SHEET PER CLUSTER)

Name of Division	Name of Village	Cluster No	Team No	Date of Interview (dd/mm/yy)	Name of Interviewer	Name of Team Leader
				____/____/____		

HH No	5.1 Does this household have a mosquito net? **If NO go to 5.6** 1 = Yes 2 = No	5.2 Where did you get it from 1 = A Shop 2 = An agency/NGO 3 = Ministry of Health 4=Other (specify)	5.3 If you got it from the shop, have you ever treated your net (soaked or dipped it in **dawa** or chemical to repel mosquito or insects)? 1 = Yes 2 = No	5.4 If YES, When did you last treat it? 1=Less than one month ago 2=Between one and six months ago 3=More than six months ago 4=Cannot remember	5.5 Who slept under the mosquito net last night? **(Probe - enter all responses mentioned)** 1) Children less than 5 years 2) Children over 5 years 3) Pregnant woman 4) Mother 5) Father 6) Nobody uses	5.6 During the Last 6 **Months**, did your household experience any incident that affects its usual ability to eat and/or buy foods of the quality, quantity or variety you prefer? 1 = Yes 2 = No	5.7 What is the action your household took to compensate the effect of that incident? Multiple answers allowed e.g. (N or A1, B2 etc) **See options attached** N=Never 1=Once per month 2=Once per week 3=Twice per week 4=3-6 times per week 5=All the time/everyday

Question 5.6

A. Reduction in the number of meals per day
B. Skip food consumption for an entire day
C. Reduction in size of meals
D. Restrict consumption of adults to allow more for children
E. Feed working members at expense of non-working
F. Swapped consumption to less preferred or cheaper foods
G. Borrow food from a friend or relative
H. Purchase food on credit
I. Consume wild foods (normal wild food)
J. Consume immature crops
K. Consume toxic/taboo foods (acacia pod/bitter fruit)
L. Food consumption of seed stock
M. Send household members to eat elsewhere
N. Withdraw child(ren) from school
O. Send children to school to eat
P. Begging or engaging in degrading jobs
Q. Individual migration out of the area
R. Household migration out of the area
S. Sale of farm implements
T. Sale of milking livestock
U. Sale of household goods
V. Disintegration of families
W. Abandonment of children or elderly
X. Sell of charcoal and/or fire wood
Y. Part of family migrating with animals to look for grazing
Z. Others