FINAL REPORT FOR FULL SMART SURVEY

MELUT COUNTY OF UPPER NILE STATE, REPEBLIC OF

SOUTH SUDAN

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FUNDED BY:

unicef

Acknowledgements

Many thanks go to the MoH and the NIWG for reviewing and approving the survey proposal and tools and also to the Melut Relief and Rehabilitation Commission and the Melut Administration who were very accommodating to the GOAL team and gave permission for the survey to take place.

GOAL also appreciates the support from its partners during the preparation and implementation of the survey, particularly UNICEF for donating the anthropometric measurement instruments.

Very many thanks to the communities from thirty five randomly selected villages/clusters, their village leaders, the community members who escorted the teams, and all the parents and caregivers, especially the mothers who gave their valuable time in answering questions and allowing their children to be measured.

Finally, I would like to express my sincere appreciation to the entire assessment team, supervisors and the support departments within GOAL for the high level of commitment, diligence and integrity demonstrated during all stages of the assessment and for high quality of data.

List of abbreviation

ASAA	Abyei Special Administrative Area
ACAD	Abyei Community Actions for Development
ANC	Ante Natal Care
ARI	Acute Respiratory Infection
ART	Antiretroviral therapy
BCG	Bacillus Calmette–Guérin
CHF	Common Humanitarian Fund
CI	Confidence Interval
CLTS	Community-led total sanitation
cm	centimetre
CMR	Crude Mortality Rate
DBC	Designing behaviour change
DPT	Diphtheria, Pertussis, Tetanus
ECHO	European Commission's Humanitarian Aid and Civil Protection department
ENA	Emergency Nutrition Assessment
EPI	Extended Programme of Immunisation
FP	Family planning
GAM	Global Acute Malnutrition
GFD	General Food distribution
GoS	Government of Sudan
HAZ	Height-for-age z-scores
HFA	Height for Age
HIV	Human Immunodeficiency Virus
HH	Household
IAPF	Irish Aid Programme Fund
ID	Index of Distribution
IDP	Internally Displaced Person
IPSE	Innovative, progressive, successful entrepreneurs
IRS	Indoor residual spraying
ITN	Insecticide treated net
IYCF	Infant and young child feeding
kg	kilogram
LLITN	Long Lasting Insecticide Treated Net
MICS	Multi-Indicators Clusters Survey
mm	millimetre
MoH	Ministry of Health
MSF	Medicines Sans Frontiers
MTCT	Mother to child transmission
MUAC	Mid Upper Arm Circumference
N	Total number

n	Number in sub group
NCHS	National Center For Health Statistics
NFI	Non Food Items
NGOs	Non-Government Organizations
NIPP	Nutrition impact positive practice
OFDA	Office of US Foreign Disaster Assistance
OPV	Oral polio vaccine
ORS	Oral Rehydration Salts
OTP	Outpatient therapeutic Programme
Penta	Pentavalent
PHC	Primary health care
PHCC	Primary health care centre
PHCU	Primary health care unit
PNC	Post Natal Care
PPS	Probability proportion to size
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SFP	Supplementary feeding programme
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SS	South Sudan
RRC	Relief and Rehabilitation Commission
STI	Sexually transmitted infection
TBA	Traditional Birth Attendant
TT	Tetanus toxoid
U5MR	Under Five Mortality Rate
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNISFA	*United Nations Interim Security Force for Abyei*
VCT	Voluntary counselling and testing
VSLA	Village savings and loan association
WASH	Water and Sanitation/ Hygiene programme
WAZ	Weight-for-age z-scores
WFP	World Food Programme
WFH	Weight For Height
WHO	World Health Organization
WHZ	Weight-for-height z-scores

Table of Contents

Executive Summary

Melut County is bordered by Manyo County across the Nile in the west, Maaban County in the east, Baliet County in the south and Renk County in the north, all in Upper Nile state. The county contains the Payams of Melut, Paloch, Bemichuk, Galdora, Wunamom and Panamdit. The region is one of wide, flat and low lying plains with black cotton soils, covered by Savannah grasslands and acacia trees. The river Nile is the main transportation route.

The sample sizes of households determined for Anthropometry and Mortality were different. In Mortality 449 households were determined whereas in Anthropometry it was 501. Therefore, 501 households were considered for both the Anthropometry and Mortality data collection for consistency. Fourteen households were visited per cluster for both anthropometry and mortality survey. At the end of the survey, 512 children were measured in 36 clustered villages through visiting 474 households. Twenty eight households reported as absent.

Recommendations

- *GOAL should Scale up targeting of acutely malnourished children through the ongoing nutrition intervention program in the County and improve active case finding until household food security is restored and critical public health issues are addressed.*

- *Eexpand coverage for nutrition and other health programs in all health facilities,*
- *Integration of nutrition with Integrated Community Case Management (ICCM) for effective management of SAM and treatment at community level of childhood illnesses.*

- *Strengthen the community mobilization activities by involving the community to own the program in active case finding, defaulter tracing, home visits and follow up of the children and through regular review meeting.*

- *Morbidity related with poor hygiene and sanitation and illness caused poor water treatment practice especially households access their water from unimproved water sources. So there should be a promotion activity through hygiene promoters addressing hand-washing practices, diarrhoea management skills and others.*

- *Hygiene and sanitation practices are poor and households who have access to latrines are low. Therefore, provision of sanitary facilities including construction of latrines and waste disposal pit at household level should be strengthened especially in host community.*

- *Strengthen water, sanitation and hygiene practices including water treatment and proper disposal of human faecal waste to avoid contamination of water sources.*

- *Since the area is considered malaria endemic, strengthen the support for LLITN distribution and awareness raising campaigns to promote effective utilization of bed nets especially for children under five and PLW.*

- *There is limited diversity in terms of diets taken. In order to improve the dietary diversity and nutritional status of the population, nutritional education and promotion of fruits and vegetables and roots and tubers and other nutritious food should be widely introduced and demonstrate for the community. .*

- *There is a need to focus on programs that improve and sustain dietary diversity and consumption of micronutrient rich foods.*

- *Strengthen introduction of small gardens to promote production and consumption of vegetables may also enhance dietary diversity and increase the intake of vitamins and minerals rich foods.*

- *Efforts should be put to support the livelihood for the population such as promoting strategies that would help improve household food security. These may include supporting agro pastoral community with farming inputs such as seeds and tools and advocate practicing alternative livelihood options in pastoral community.*

Table 1: Summary of survey findings

Anthropometry - Children 6-59 months based on WHO 2006 standard		
Index	**Indicator**	**Percent**
WHZ- scores	Prevalence of global malnutrition (<-2 z-score and/or oedema)	(n= 73) 14.3% (10.9-18.4)
	Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(n= 68) 13.3% (10.1-17.2)
	Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(n= 5) 1.0% (0.4-2.3)
WAZ- scores	Prevalence of underweight (<-2 z-score)	(n= 110) 21.5% (17.7-25.8)
	Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(n= 94) 18.4% (14.7-22.7)
	Prevalence of severe underweight (<-3 z-score)	(n= 16) 3.1% (1.9-5.2)
HAZ-scores	Prevalence of stunting (<-2 z-score)	(n= 92) 18.5% (15.1-22.6)
	Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(n= 64) 12.9% (10-16.6)
	Prevalence of severe stunting (<-3 z-score)	(n= 28) 5.6% (4.0-7.9)
MUAC	Prevalence of global malnutrition (< 125 mm and/or oedema)	(n= 34) 6.6 % (4.6-9.5 95% CI)
	Prevalence of moderate malnutrition (< 125 mm and >= 110 mm, no oedema)	(n= 32) 6.3 % (4.2-9.1 95% CI)
	Prevalence of severe malnutrition (< 115 mm and/or oedema)	(n= 2) 0.4 % (0.1-1.6 95% CI)
Mortality, retrospectively 90 recall period		
Mortality	CMR Deaths/10,000 people/day	(n= 19) 0.77 (0.45-1.32)
	U5 MR Deaths/10,000 children U5/day	(n= 4) 0.82 (0.31-2.17)
Immunization coverage of Measles and Penta3 and vitamin A supplementation	Measles with car + mother confirmation	(n= 366) 76.1% (72-79.8)
	BCG	(n= 362) 70.7% (66.5-74.6)
	Vitamin A	(n= 271) 52.9% (48.5-57.3)
Reported illness		(n= 265) 51.8% (47.3-56.2)
Types of illness	Malaria/fever	(n= 93) 35.1% (29.4-41.2)
	Diarrhoea	(n= 71) 26.8% (21.6-32.6)
	Cough/difficulty of breathing	(n= 59) 22.3% (17.4-27.8)
	Skin infection	(n= 26) 9.8% (6.5-14.0)
	Eye infection	(n= 16) 6.0% (3.5-9.0)
Health seeking behaviour		(n= 220) 83.0%
Treatment sought	None sought	(n= 34) 12.7%
	Hospital	(n= 52) 19.5%
	PHCC/PHCU	(n= 168) 62.9%
	Mobile outreach clinic	(n= 1) 0.4%
	Private pharmacy	(n= 6) 2.2%
	Relative/friends	(n= 1) 0.4
	Drug market	(n= 2) 0.7%
	Pharmacy	(n= 3) 1.1%

1.0 Background

Melut County is bordered by Manyo County across the Nile in the west, Maaban County in the east, Baliet County in the south and Renk County in the north, all in Upper Nile state. The county contains the Payams of Melut, Paloch, Bemichuk, Galdora, Wunamom and Panamdit. The region is one of wide, flat and low lying plains with black cotton soils, covered by Savannah grasslands and acacia trees. The river Nile is the main transportation route.

The largest communities in the county are Dinka, Shilluk, Burum, Fur, Nubian and Nuer people. There are many migrants in the towns of Melut, Paloch and Galdora.

The River Nile and its small seasonal tributaries are the main sources of drinking water, fishing grounds and water for cattle, particularly in the dry season. Most people relay on agro-pastoralism for a living, and engage in small scale trading. The main seasonal crop is sorghum, and to a lesser extent maize. Crops grown on a small scale throughout the year include tomatoes, okra and onions.

The government-run Melut Hospital has been open since February 2005 with two doctors, one medical assistant, one pharmacist, one laboratory technician and ten nurses. The hospital has one male ward and two female wards, and a theatre which performs minor surgeries. The laboratory is not equipped for comprehensive diagnosis. Mediar opened a Primary Health Care Center in Melut Payam in February 2007. As well as the main clinic, Medair has supported six primary health care units run by the Ministry of Health in remote areas of the county.

Performance against health indicators remains poor, as most primary health care facilities lack a functional cold chain. Cultural stigma surrounding modern child spacing, and strong preferences for home births continue to hinder gains in maternal and natal health. As with the rest of South Sudan, malaria, diarrhea, and acute respiratory illnesses are the three most common morbidities in children under five.

With the normalization of security situation, most populace have settled along or near the banks of river Nile and depend on river water for household consumption, drinking and for livestock. Other households are supplied with untreated water for both household consumption and drinking by commercial water vendors and oil company trucks. There are no community boreholes in Melut. This exposes the community to risk of contracting diarrheal diseases and other waterborne diseases.

According to an Interagency Assessment conducted in Melut by UNHCR, UNICEF, GOAL and IMA in June 2015, the WASH need remains high with virtually low access to safe and clean drinking water, non-existent sanitation facilities, wide spread open defecation and low hygiene practices

2.0 General objectives

GOAL has conducted full SMART survey in Melut County in order to better understand the existing health and nutrition situation of the population based on WHZ, MUAC and nutritional bilateral pitting oedema to inform programing and humanitarian response/need.

2.1 Specific objectives

- To estimate the prevalence of acute malnutrition (wasting and oedema) among children aged 6-59 months.
- To estimate the coverage of health interventions (e.g. measles vaccinations, vitamin A supplementation and BCG and deworming)
- To retrospectively estimate the levels of crude mortality rates and age specific mortality rates in a specific time period (roughly 90 days).
- To assess a two weeks (14 days) morbidities in under five children.
- To assess the food security situation of the population
- To assess the Infant and young children feeding practice (IYCF) and WASH situation in the community.
- To assess contextual factors associated with malnutrition.
- To propose necessary recommendations for future interventions.

3.0 Methodology

Standardized Monitoring and Assessment of Relief and Transition (SMART) methodology was employed to undertake the nutrition and retrospective mortality survey in Melut County. The survey was designed using SMART methodology with probability proportional to size at the first stage of sampling. The SMART methodology provides a basic integrated method for assessing nutritional status and mortality rate in emergency situations and provides the basis for understanding the magnitude and severity of humanitarian crises.

3.1 Survey design

A two-stage cluster sampling approach based on a population sampling frame probability proportion to size (PPS) of all smallest rural villages will be used as per SMART survey methodology.

3.1.1 Sample size calculation

The sample size was calculated using ENA for SMART, July 21st, 2015 version. The following parameters were considered for sample size calculation for both Anthropometry and Mortality.

1. Anticipated malnutrition rate, 2. The Desired Precision 3. The Design Effect 4. Average household size, 5. Percent of children under five and 6. Percent of non-response households.

Sample sizes for Anthropometric and Mortality data was calculated separately as described the table below. SMART survey conducted in Maiwut (March 2016, GOAL) was referred to calculate the sample size of Anthropometry and Mortality.

Table 2: Sample size calculation for Anthropometry and Mortality

Parameters/values	Anthropometric survey	Mortality survey	Remark
Estimated prevalence	24.0%[1]	0.54[2]	
± Desired precision	5.0	0.35	
Design effect	1.8[3]	1.5	
Recall period in days		90	
Percent of U5 children	17.8%		
Average household size	7.2	7.2	
Percent of non-responsive HHs	5%	5%	
Sample size	549 children and 501 HHs	3073people 449 HHs	

3.1.2 Sample size for Anthropometry data

Sample size was calculated using ENA for SMART, July 2015, with an expected 24.0% prevalence of malnutrition. A standard 5.0% precision was used with a design effect of 1.8 was used to inflate sample size estimates and to compensate for possible bias resulting from cluster sampling. Other factors were used such as an average household size of 7.2 and under-five year old children were estimated at 17.8% of the population. Five present was then added for non-response households, giving a sample size of 512 children, estimated to be found by visiting 473 households.

3.1.3 Sample size for mortality data

Similarly, a two stage cluster sampling was also used to estimate mortality rates. The sample size for the mortality survey was calculated using the ENA for SMART, July 2015 version. Crude Mortality Rate (CMR) of 0.55 was estimated to reflect retrospectively the morality rate in the County with a precision of 0.35 and a design effect of 1.5. The average household size was entered as 7.2. On top of this 5% was used for potential non-response households.

The sample sizes of households determined for Anthropometry and Mortality were different. In Mortality 449 households were determined whereas in Anthropometry it was 501. Therefore, 501 households were considered for both the Anthropometry and Mortality data collection for consistency. Fourteen households were visited per cluster for both anthropometry and mortality survey. At the end of the survey, 512 children were measured in 36 clustered villages through visiting 474 households. Twenty eight households reported as absent.

Retrospective mortality rates were estimated using a recall period of 90 days.

3.2 Cluster assignment /selection

A cross sectional, two-stage cluster survey was employed to collect nutritional and mortality data as well as contextual data. The Emergency Nutrition Assessment (ENA) for Standardized Monitoring of Relief

[1] Point prevalence of GAM 24.0% (95% CI 20.6-27.7) March 2016, Maiwut
[2] Point mortality rate, CMR 0.54 (95% CI 0.31-0.95), March 2016, Maiwut
[3] The SMART survey was covered both the IDPs and host community in this case the Design effect = 1.8%.

and Transitions (SMART), July 2015 version was used to assign the clusters using the updated village-level population data of the County.

Clusters were assigned using ENA for SMART, July 2015 version. All villages included in the sample frame were entered into the software with their population numbers. The SMART software then randomly assigned clusters, with the chance of each village being chosen proportional to its population size (PPS). Using this technique allows every village to have the same probability of being selected. In order for a survey to be truly representative, every member of the population must have an equal chance of being chosen. Please refer the cluster assignment in Appendix 4.

3.3 Second stage of sampling:

Household selection

Upon arrival at the randomly selected village, the village chief was found and an introduction was made and the purpose of the survey explained. Segmentation was used depending on the size of the village. The villages larger than 100 households were segmented and one of the segmented sub village was then selected randomly while the smaller villages were assessed completely.

The team then listed all the households residing in the village with the help of the village chief or representative. After drawing up the list of the households 14 households between 1 and the last number which correspond to the list of households were selected by using a Random Number Table for the simple random sampling method. Then the teams would start with any convenient randomly selected household. If a household was not at home when the survey team passed, they noted the household name and number and returned later for revisiting. No substitution for absent and refusal households.

3.3.1 Selection of children

In every household visited the mother/caregiver was interviewed. If there was more than one wife in the household
and they cook separately, they were considered as to be as independent households but if they eat from the same cooking pot for different houses, then they were considered as single household. If there were children between 0 - 59 months old in the household the child health and child feeding questionnaire was administered, as well as the other household indicator questions. All eligible children aged between 6 and 59 months in each visited household were included for the anthropometric questions. If a child was missing, the survey team returned to the household to check for the child later in the day. If the child is still away the team was considered as absent. No replacement of absent children.

3.4 Training

The total number of survey participants trained was 14 enumerators, six team leaders and two supervisors and a total of 22 participants were involved in the training. Training was conducted for five days, including a field test. The training covered survey objectives, basic malnutrition, and concept of sampling and SMART survey methodology followed by anthropometric measurements, recognition of the signs and symptoms of malnutrition including nutritional bi-lateral oedema and interview techniques.

The pilot survey was conducted in an area which was not selected for the survey. Observations of errors in the performance of each team with regards to undertaking measurements and completing the questionnaires were identified, discussed and corrected with all team members by the team supervisors and the Survey Manager.

Training was carried out by GOAL's Survey Manager and was conducted in English and the local language. Six teams were formed, each consisting of an interviewer, two measurers and a supervisor who was responsible for ensuring the recording of all data collected as well as ensuring accuracy of measurements taken, methodology and any other technical issues raised while in the field.

3.5 Data collected

Four questionnaires were used to collect the data: a mortality questionnaire asked in all households, a anthropometric questionnaire asked for all children 6-59 months, a child health and feeding questionnaire for all children between 0-59 months; and a household questionnaire asked at all households containing children less than five years, which includes WASH, livelihoods, and health.

The survey data was collected using six SMART phones in SurveyCTO. The digital data gathering device avoid errors and missing data that increases the quality of data. The data uploaded to the computer every night and feedback was given to the team at a daily basis in the morning.

3.5.1 Mortality data

The survey team collected data for the mortality questionnaire in every household visited regardless of whether there were children less than five years or not. Information collected included:

- Total number of people in the household
- Number of children under five years
- Number of people who left the household within the recall period (total and under five years)
- Number of people who joined the household within the recall period (total and under five years)
- Number of births in the household within the recall period
- Number of deaths in the household within the recall period (total and under five years)
- Cause of deaths

3.5.2. Individual information per survey child - Anthropometric data

- Sex
- Age (in months) determined using a local events calendar (Appendix 3)
- Weight (in kilograms) measured to a precision of 0.1 kg using hanging 25 kg Salter scales (children 6-59 months only)
- Height (in centimetres) measured to the nearest 0.1 cm using length/height boards. Children <87 cm were measured lying down (children 6-59 months only).
- Presence of bilateral pitting oedema on both feet after three seconds of pressure
- MUAC, to the nearest millimetre

3.5.3 Individual information per survey child - Child Health and Feeding

- Vaccination status for measles and Pentavalent 3, based on documentation on the child's under-five card or verbal confirmation
- Vitamin A supplementation status in the past six months (children age 6-59 months only, by showing vitamin 'A' capsule)
- Child morbidity in the past two weeks before the survey and health seeking practices
- Child LLITN use the night before the survey
- Initiation of breast feeding
- If the child is currently breast feeding
- What did the child eat the day before the survey
- What did the child drink the day before the survey

- Feeding practices during illness
- Number of meals the child had the day before the survey.

3.5.4 Household information

Data for the household questionnaire was collected in every household visited with children less than five years. Information was collected on the following areas:

- Household demography
- Household livelihood and food security
- Income sources
- General health, reproductive health and HIV
- Water, sanitation and hygiene services and practices

3.6 Survey implementation

After completing five days training the field work was conducted from the 20th – 26th May 2016 for six consecutive days. Six teams were formed to carry out the survey each consisting of three people: One team leader, who was responsible for overseeing the team's activities, quality of the field work, survey methodology and completion of the data needed before leaving the field, including accurate capturing of the data on the SMART phone. Two anthropometric measurers who carried out weight, height and MUAC measurements and checked for the presence of oedema and one supervisor who was generally responsible providing support for the team especially during household selection, anthropometry measurement and other activities and two local porter/guide.

3.7 Classifying malnutrition

Weight-for-height

Weight-for-height z-scores (WHZ) were calculated to give the prevalence of acute malnutrition or wasting. Wasting can be assessed by comparing a child's weight with the weight that would be expected from a healthy child of the same height and sex. For the purposes of this report, the WHO Growth Standards, 2006 which have been adopted in North Sudan is used as the healthy comparison group to ensure comparison from previous years and across country surveys to obtain z-scores.

Table 3: Wasting as defined by WHO

Global Acute Malnutrition (GAM) Moderate & severe wasting	<-2 z-scores weight-for-height (WFH) and/or oedema
Severe Acute Malnutrition (SAM) Severe wasting	<-3 z-scores weight-for-height (WFH) and/or oedema

Mid-upper arm circumference (MUAC)

MUAC is a simple and important tool as it is the best predictor of those cases most at risk of dying once the MUAC falls below 115 mm; however it is not a sensitive early predictor of malnutrition[4]. Children 6-59 months whose arm circumference is less than 125 mm may be acutely malnourished and less than 115 mm severely malnourished.

Height-for-age

Height-for-age z-scores were calculated to give the prevalence of chronic malnutrition or stunting. Stunting can be assessed by comparing a child's height with the height of a healthy child of the same

[4] WHO/UNICEF. WHO child growth standards and the identification of severe acute malnutrition in infants and children: A joint statement. 2009.

age. Stunting is an index of long-term nutritional deprivation where growth is being compromised to conserve nutrients and energy for the maintenance of the body. It is also necessary to know the exact age of the child to accurately determine stunting which was a limitation of this survey therefore this data should be interpreted with caution. Even though an events calendar was used when estimating each child's age to the nearest month SMART rated the quality of the age data as unacceptable. As seen in the Table below, stunting is defined as <-2 z-scores, whereas severe stunting is defined as <-3 z-scores.

Table 4: Stunting as defined by WHO

Global Chronic Malnutrition Global Stunting	<-2 z-scores height-for-age (HFA)
Severe Chronic Malnutrition Severe Stunting	<-3 z-scores height-for-age (HFA)

Weight-for-age

Weight-for-age z-scores were calculated to give the prevalence of under nutrition or underweight. Underweight can be assessed by comparing a child's weight with the weight of a healthy child of the same age. It is also necessary to know the exact age of the child to accurately determine underweight which was a limitation of this survey; therefore this data should be interpreted with caution. Even though an events calendar was used when estimating each child's age to the nearest month SMART rated the quality of the age data as unacceptable. Underweight is defined as <-2 z-scores, whereas severe underweight is defined as <-3 z-scores.

Population cut-offs for malnutrition

The Table below defines the population cut-offs for determining the severity of the malnutrition when the prevalence of acute and chronic malnutrition is known. These levels are internationally agreed upon and provide an objective basis for developing responses to increased levels of acute and chronic malnutrition[5]. To interpret proportions at a population level with meaning, absolute numbers are also necessary (i.e. 8% of a large population will be many more than 15% of a small population).

Table 5: WHO population cut-offs for chronic and acute malnutrition

Index	Normal/Low	Poor/Medium	Serious/High	Critical/Very high
Global Underweight	<10%	10-19.9%	20-29.9%	>30%
Global Chronic Malnutrition	<20%	20-29%	30-39%	≥40
Global Acute Malnutrition	<5%	5-9%	10-14%	≥15
(GAM) Mean weight for height z-score	>-0.40	-0.40 to –0.69	-0.70 to –0.99	≤-1.00

[5] Physical Status: The use and interpretation of Anthropometry. Report of a WHO expert committee, 1995. Chapter 5, p208 & 212

4.0 SURVEY RESULT

A total of 512 children (257 boys and 255 girls) were measured to estimate their nutritional status through anthropometric measurements from 473 households. Initially it was planned to measure 549 children however, at the end of the survey 93.2% plus was achieved. The entire 36 clusters were covered in the assessment.

It was checked for outliers (values that lie +/-3 SD from the observed mean). Outliers were flagged by the SMART software as not being plausible values of either weight, height or age was incorrect. The SMART flags were excluded from the analysis but not from the data. There was no flagged records in weight-for-height hence a total of 512 children were analysed to estimate the Global Acute Malnutrition (GAM) of children 6-59 months

Distribution by age and sex

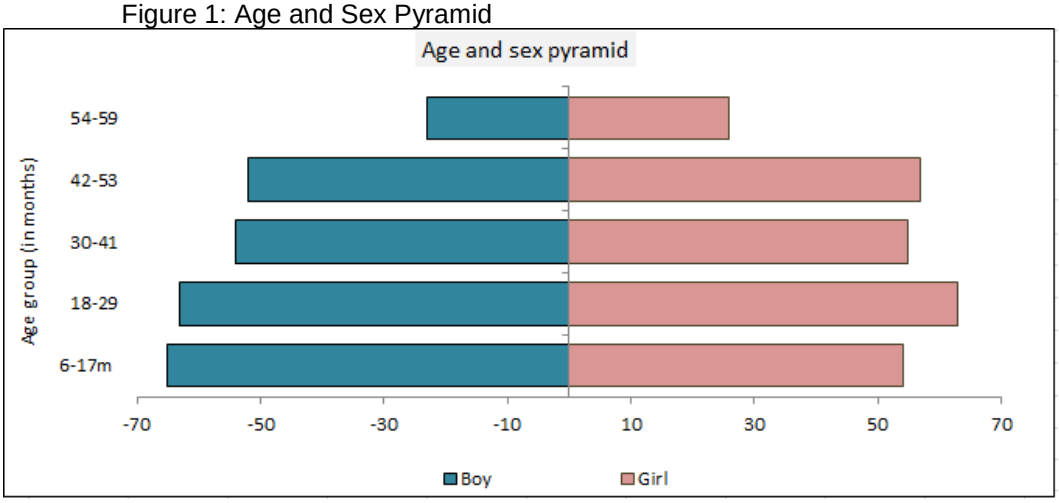
Table 6: Distribution of age and sex of sample

	Boys				Girls		
Age groups	no.	%	no.	%	no.	%	Boy:girl
6-17 months	65	54.6	54	45.4	119	23.2	1.2
18-29 months	63	50.0	63	50.0	126	24.6	1.0
30-41 months	54	49.5	55	50.5	109	21.3	1.0
42-53 months	52	47.7	57	52.3	109	21.3	0.9
54-59 months	23	46.9	26	53.1	49	9.6	0.9
Total	257	50.2	255	49.8	512	100.0	1.0

Overall sex ratio in the plausibility exhibited, P= 0.930 which means boys and girls were equally represented in the sample and age ratio of 6-29 months to 30-59 months was 0.92, p-value= 0.387 (as expected). Overall age distribution for boys and girls showed 0.751 and 0.897 which can be defined as equally represented as expected.

The plausibility report generated by ENA for SMART, July 9th 2015 software revealed that the overall survey quality scored at 12% which indicates the quality of the data was good and could be taken as credible data to be taken for further analysis and programmatic decision.

Figure 1: Age and Sex Pyramid



4.2.1 Nutritional Anthropometry (Acute Malnutrition)

Prevalence of acute malnutrition by W/H z- score based on WHO standard

*Weight-for-Height (W/H**)** is the nutrition index that reflects short-term growth failure (acute malnutrition, wasting) and is defined by a child's weight (kg) and its height or length (cm) in relation to a standard or reference population of the same height/length. Acute malnutrition prevalence is estimated from the weight for height (W/H) index values combined with the presence of oedema. The WFH indices are expressed in Z-scores according to WHO standard.*

Global acute malnutrition is defined as <-2 z scores weight-for-height and/or oedema, severe acute malnutrition is defined as <-3 z scores weight-for-height and/or oedema). It is also used in the classification of global, moderate and severe acute malnutrition (GAM, MAM and SAM).

Table 7: Prevalence of acute malnutrition based on WH z-scores and/or oedema, by sex

	All n = 512	Boys n = 257	Girls n = 255
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(73) 14.3 % (10.9-18.4 95% CI)	(38) 14.8 % (10.5 - 20.4 95% CI)	(35) 13.7 % (9.8 - 18.8 95% CI)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(68) 13.3 % (10.1-17.2 95% CI)	(34) 13.2 % (9.2 - 18.7 95% CI)	(34) 13.3 % (9.4 - 18.5 95% CI)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(5) 1.0 % (0.4 - 2.3 95% CI)	(4) 1.6 % (0.6 - 4.1 95% CI)	(1) 0.4 % (0.1 - 2.9 95% CI)

The prevalence of oedema is 0.0%

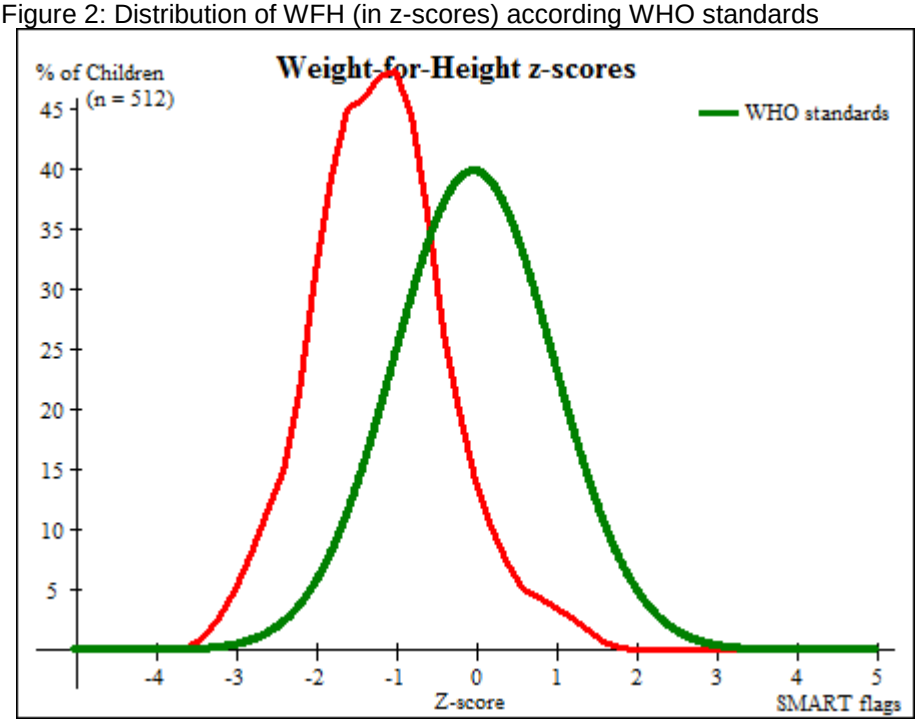
As indicated above the estimated prevalence of Global Acute Malnutrition (GAM) in Melut County was estimated at 14.3% (10.9-18.4 95% CI) and the prevalence of Severe Acute Malnutrition (SAM) was estimated at 1.0% (0.4-2.3 95% CI). There was no a child identified as nutritional bilateral oedema.

There is statistically no significant difference between girls and boys in the prevalence of GAM and SAM as p-value = 0.5213 indicating that both boys and girls are at equal risk of malnutrition.

Table 8: Prevalence of acute malnutrition by age based on WH z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (≥ -3 and <-2 z-score)		Normal (≥ -2 z-score)		Oedema	
Age (months)	Total	n	%	n	%	N	%	n	%
6-17	119	2	1.7	23	19.3	94	79.0	0	0.0
18-29	126	3	2.4	13	10.3	110	87.3	0	0.0
30-41	109	0	0.0	13	11.9	96	88.1	0	0.0
42-53	109	0	0.0	8	7.3	101	92.7	0	0.0
54-59	49	0	0.0	11	22.4	38	77.6	0	0.0
Total	512	5	1.0	68	13.3	439	85.7	0	0.0

Figure 2: Distribution of WFH (in z-scores) according WHO standards



The mean weight-for-height z- score was -1.18 indicates that the nutritional status of U5 population is poor as compared with WHO standard due to its deviation to the left side from the normal curve. The standard deviation (SD) of the z-scores is 0.83, which is below the cut-off point of 1.2 indicating that the quality of the data is acceptable.

The value for skewness and kurtosis rated as -0.31 and 0.32 and both the skewness and kurtosis lie within the acceptable range of ±1.0 that the distribution can be considered as normal.

The value of Index of Distribution (ID) in the plausibility result shows ID= 1.03 and p-value = 0.422. According to the ID and p- value result, the malnutrition cases appear to be randomly distributed among the clusters indicating that the distribution is homogeneous as the P-value is between 0.05 and 0.95. Therefore, the plausibility check in ENA software revealed that the overall quality of the data was characterized as good (12%).

Table 9: Distribution of severe acute malnutrition and oedema based on W/H (in 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. 5 (1.0 %)	Not severely malnourished No. 507 (99.0 %)

Table 10: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 512	Boys n = 257	Girls n = 255
Prevalence of global malnutrition (< 125 mm and/or oedema)	(34) 6.6 % (4.6 - 9.5 95% C.I.)	(16) 6.2 % (3.8 - 10.0 95% CI)	(18) 7.1 % (4.2 - 11.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(32) 6.3 % (4.2 - 9.1 95% C.I.)	(15) 5.8 % (3.5 - 9.6 95% C.I.)	(17) 6.7 % (3.9 - 11.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(2) 0.4 % (0.1 - 1.6 95% C.I.)	(1) 0.4 % (0.1 - 2.9 95% C.I.)	(1) 0.4 % (0.1 - 2.9 95% C.I.)

Children 6-59 months were the targeted groups for MUAC measurement. MUAC is a measurement of mid-upper circumference of a child which is good indicator of acute malnutrition and mortality. Their MUAC were taken accordingly to compliment with the other anthropometric findings. Of the 512 children assessed using MUAC 6.6% were prevalence of global malnutrition and 0.4 percent were severely malnourished.

Table 11: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	119	0	0.0	26	21.8	93	78.2	0	0.0
18-29	126	2	1.6	6	4.8	118	93.7	0	0.0
30-41	109	0	0.0	0	0.0	109	100.0	0	0.0
42-53	109	0	0.0	0	0.0	109	100.0	0	0.0
54-59	49	0	0.0	0	0.0	49	100.0	0	0.0
Total	512	2	0.4	32	6.3	478	93.4	0	0.0

4.2.2 Underweight

Table 12: Prevalence of underweight among 6-59 months children based on WAZ and by sex

	All n = 512	Boys n = 257	Girls n = 255
Prevalence of underweight (<-2 z-score)	(110) 21.5 % (17.7 - 25.8 95% CI)	(53) 20.6 % (16.3-25.8 95% CI)	(57) 22.4 % (16.8-29.1 95% CI)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(94) 18.4 % (14.7 - 22.7 95% CI)	(45) 17.5 % (13.4-22.5 95% CI)	(49) 19.2 % (14.0-25.8 95% CI)
Prevalence of severe underweight (<-3 z-score)	(16) 3.1 % (1.9 - 5.2 95% CI)	(8) 3.1 % (1.7 - 5.7 95% CI)	(8) 3.1 % (1.6 - 6.1 95% CI)

The overall prevalence of underweight was estimated at 21.5% while the severe underweight estimated at 3.1%.

Table 13: Prevalence of underweight among 6 to 59 months children based on WAZ

		Severe underweight (<-3 z-score)		Moderate underweight (≥ -3 and <-2 z-score)		Normal (≥ -2 z-score)		Oedema	
Age mths	Total	n	%	n	%	n	%	n	%
6-17	119	3	2.5	16	13.4	100	84.0	0	0.0
18-29	126	5	4.0	23	18.3	98	77.8	0	0.0
30-41	109	6	5.5	26	23.9	77	70.6	0	0.0
42-53	109	0	0.0	21	19.3	88	80.7	0	0.0
54-59	49	2	4.1	8	16.3	39	79.6	0	0.0
Total	512	16	3.1	94	18.4	402	78.5	0	0.0

4.2.3 Chronic malnutrition (stunting)

Table 14: Prevalence of stunting based on height-for-age z-scores and by sex

z-score	All n = 496	Boys n = 250	Girls n = 246
Prevalence of stunting (<-2 z-score)	(92) 18.5% (15.1 - 22.6 95% CI)	(51) 20.4 % (16.6 - 24.8 95% .I)	(41) 16.7 % (12.0 - 22.7 95% CI)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(64) 12.9% (10.0-16.6 95% C.I.)	(33) 13.2 % (9.9 - 17.4 95% C.I.)	(31) 12.6 % (8.5 - 18.3 95% CI)
Prevalence of severe stunting (<-3 z-score)	(28) 5.6 % (4.0 - 7.9 95% CI)	(18) 7.2 % (4.8 - 10.6 95% .I)	(10) 4.1 % (2.1 - 7.7 95% CI)

Stunting is growth failure in a child that occurs over a slow cumulative process as a result of inadequate nutrition and/or repeated infections, measured by the height-for-age index. The findings the survey revealed that the overall global chronic malnutrition prevalence was estimated at 18.5% (15.1-22.6 95% C.I) and severe chronic malnutrition prevalence of 5.6% (4.0-7.9 95% C.I).

Table 15: Prevalence of chronic malnutrition based on HAZ and by age

		Severe stunting (<-3 z-score)		Moderate stunting (≥ -3 and <-2 z-score)		Normal (≥ -2 z-score)	
Age mths	Total	n	%	n	%	n	%
6-17	115	5	4.3	11	9.6	99	86.1
18-29	120	6	5.0	18	15.0	96	80.0
30-41	104	10	9.6	24	23.1	70	67.3
42-53	108	6	5.6	9	8.3	93	86.1
54-59	49	1	2.0	2	4.1	46	93.9
Total	496	28	5.6	64	12.9	404	81.5

4.3 Mortality

Table 16: Mortality Demographic Information, (473 households interviewed, recall period of 90 days)

HOUSEHOLD INFORMATION			
Total population		Children 0-59 months	
Total number HH residents	2744	Number 0-5 years	540.5
Total number people joined HH in recall period	57	Number 0-5yrs joined HH during recall period	27
Total number people left HH in recall period	161	Number 0-5 years left HH during recall period	17
Total number births during recall period			22
Total number deaths during recall period	19	Number 0-5 years deaths during recall period	4
Crude mortality rate (deaths/10,*000*/day)	0.77 (0.45-1.32)	Under-5 mortality rate (deaths/10,000/day)	0.82 (0.31-2.17)
Design effect	1.35	Design effect	1.00

A proxy indication of mortality was taken retrospectively to provide some idea on the mortality situation of the population. The mortality assessment was done to all the targeted households with and with no under-five child.

Retrospective mortality rates were estimated using a recall period of 90 days. The information was collected from 14 randomly selected households per cluster, and the summary of the result as presented in table above, a total of 473 households and 2,744 individuals were included in the 90 days retrospective mortality rates estimation.

Crude Mortality Rate (CMR) was 0.77 deaths/10,000 people/day while the Under-five Mortality Rate (U5MR) was estimated 0.82 deaths/10,000 children/day. Both CMR and U5 mortality rates was below the emergency threshold of >=1.14 and >= 2.3 deaths for sub-Saharan African Countries respectively[6]. Hence, both Crude Mortality rate and U5 MR can be considered as normal and did not indicate an emergency situation in Melut County.

Table 17: Causes of death for both CMR and U5MR

No.	Causes of death	#	%	Location of death
1	Unknown	6	31.6%	Current location 68.4% (n= 13)
2	Diarrhoea	2	10.5%	
3	Injury/Traumatic	1	5.3%	
4	Old age	6	31.6%	During migration 10.5% (n= 2)
5	ARI	2	10.5%	
6	Fever/malaria	1	5.3%	Last residence 21.1% (n= 4)
7	Maternal mortality	1	5.3%	

[6] SMART Guidelines, 2008

The survey finding revealed that from the total 19 deaths, four of them are under five children; the main causes of death for under five children were diarrhoea and ARI.

4.4 Other results

4.4.1 Child morbidity

Table 18: Prevalence of reported illness 2 weeks prior to the survey (N= 512)

6-59 months	n	%	95% C.I.
Prevalence of reported illness	265	51.8	47.3-56.2

265 children (51.8%) were reported to have been ill during the period two weeks prior to the survey date.

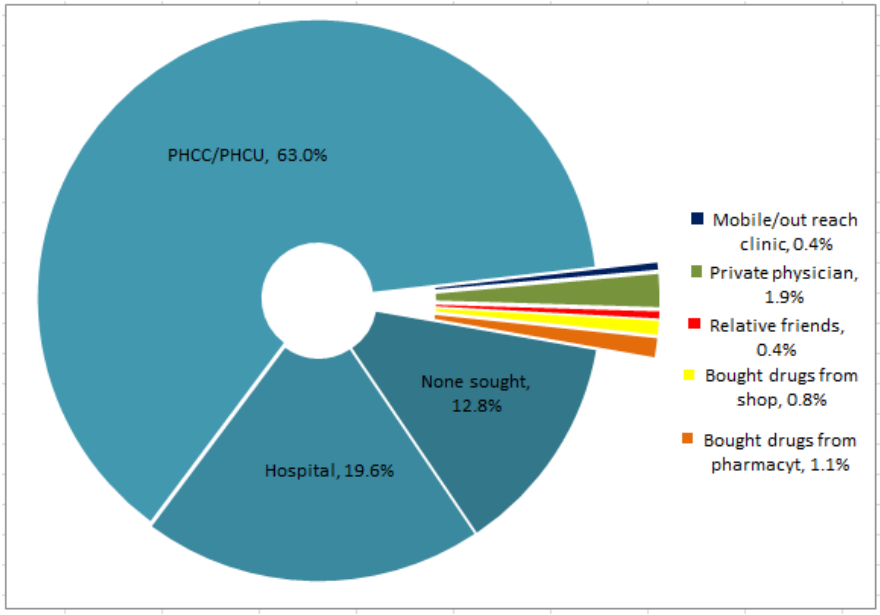
Table 19: Symptom breakdown in the children in the two weeks prior to interview (n= 265)

Illness/symptom breakdown	n	%	95% CI
Fever /malaria	93	35.1	29.4-41.2
Diarrhoea	71	26.8	21.6-32.6
Cough/difficulty of birthing	59	22.3	17.4-27.8
Skin infection	26	9.8	6.5-14.0
Eye infection	16	6.0	3.5-9.6
Total	265	100%	

The common childhood illness was determined based on a fourteen days recall period. Mothers/caregivers were asked whether each of their child in the household have been sick in the two weeks prior to the survey date.
As per the interviewed mothers and caregivers, among the sample children 6 to 59 months, 51.8% (n= 265) children had been ill in the fourteen days period prior to the survey date. Fever/malaria followed by diarrhoea and cough/difficulty of birthing were the most common illnesses reported. Further, skin and eye infection were other common childhood illnesses reported.

The association between acutely malnourished children with that of ill children in two weeks prior to the survey was statistically not significant (p-value = 0.8823).

Figure 3: Treatment sought



Health seeking behaviour was also explored by asking what treatment the respondent sought when the child was getting ill. Of those sick children, more than three fourth of the children 83.0% (n= 220) were taken to health facility for treatment such as hospital, PHCC and mobile clinics. Whereas about 12.8% (n= 34) of them were not taken to health facility for treatment for their illnesses. The majority of mothers and care givers were taken their children to PHCC.

Figure 4: LLINT

LLINT	No.	%	95% CI
No	269	52.2	48.1-56.9
Yes	243	47.5	43.1-51.9

Mothers and care givers were asked the use of long lasting insecticide treated mosquito net (LLITN), as a response from the total (N= 512) assessed children 6-59 moths, nearly half of the children 47.5% n= 243, 95% CI 43.1-51.9 slept under mosquito net.

4.4.2. Measles Immunization and vitamin A supplementation

Table 20: Immunization and Vitamin 'A' supplementation

	Measles (9-59 months) N= 481	BCG (9-59 months) N= 512	Vitamin 'A' (6-59 months) N= 512
Yes, card/scar	n= 125 26.0% 95% CI (22.2-30.2)	n= 362 70.7% 95% CI (66.5-74.6)	
Yes, mother recall	n= 241 50.1% 95% CI (45.5-54.7)		n= 271 52.9% 95% CI (48.5-57.3)
Card + mother confirmation	n= 366 76.1% 95% CI (72.0-79.8)		

No	n= 106 22.0% 95% CI (18.5-26.1)	n= 150 29.3% 95% CI (25.4-33.5)	n= 241 47.1% 95% CI (42.7-51.5)
Don't know	n= 9 1.9% 95% CI (0.9-3.7)	0.0%	0.0%

During the assessment the survey team showed a vitamin 'A' capsule for mothers and caregivers to recall whether their children had received Vitamin 'A' or not in the past six months. According to the current survey result about 52.9%, (n= 271) confirmed by mother that the children reported as having received vitamin 'A' supplementation once in the last six months.

Measles vaccination was assessed through checking a vaccination card and recall by mothers of children 9-59 months of age. As the response, the mother of 26.0%, (n= 125) of children 9 to 59 months old were able to show vaccination card. The reminder 50.1% (n= 241) of mothers confirmed that their children had been vaccinated for measles. As a result Measles immunization by card plus mothers' confirmation reached at 76.1% (n= 366).

At the same time BCG was assessed through checking a scar both in the right/left hand of children 6-59 months of age. The assessment result indicates that 70.7% (n= 362) of the children 6-59 have scar on their right/left hand.

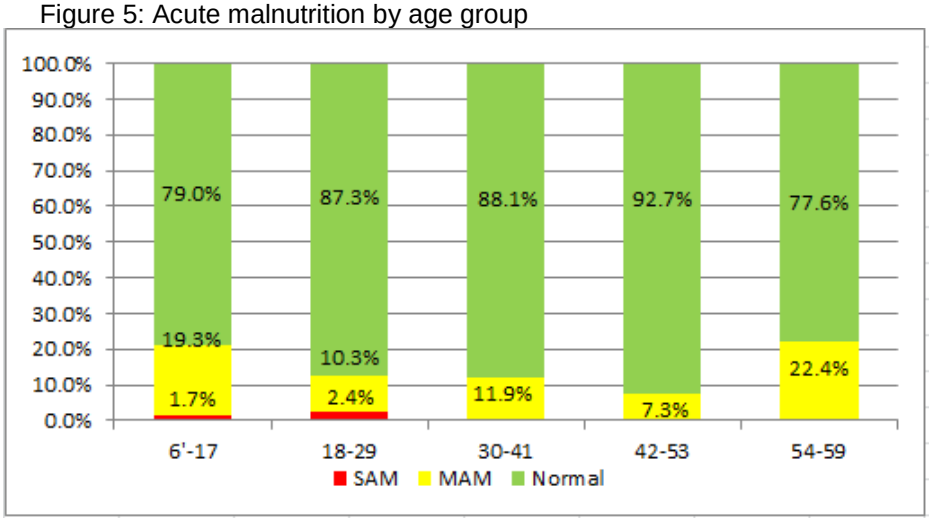
It was tested to see the association between immunization and vitamin 'A' supplementation in relation with acute malnutrition. There was statistically no significant difference between acutely malnourished children and those not supplemented against Vitamin 'A' and immunized against Measles as p-value = 0.5146 and 0.6097 respectively. Therefore, children who had been immunized against measles and supplemented against vitamin A were equally at risk of malnutrition with their counterpart who had not been immunized and supplemented.

5.0 Nutritional status

The current full SMART survey in Melut County is the first of its kind when GOAL conducts full scale SMART survey in Melut County. The prevalence of Global Acute Malnutrition (GAM) based on weight for height z-scores in WHO standard was estimated at 14.3% (95% CI 10.9-18.4) and Sever Acute Malnutrition (SAM) was estimated at 1.0%.(95% CI 0.4-2.3). This level of Global Acute Malnutrition (14.3%) is below the emergency threshold of 15.0%. However with the aggravating factors of poor food security situation at household level, poor access to improved water source and hygiene and sanitation the level of acute malnutrition can be classified as **serious.**

The prevalence of severe acute malnutrition of 1.0% is high and should be viewed with caution since there are high numbers of moderately malnourished cases near to the severe cut off and that can easily fall into the severe category and push the prevalence of SAM to a higher level. Programmatic responses need to consider children classified as severely malnutrition.

Figure 5: Acute malnutrition by age group



Younger children age 6-29 months are at highly risk of malnutrition than the older children. Out of (N= 5) with severe acute malnutrition 100% (n=56) children were found in the youngest age group between 6-29 months. Similarly, from the total (N= 68) moderately malnourished children more than half 52.9% (n= 36) fall under the younger age group.

Normally, the prevalence of malnutrition tends to be higher in the younger age groups than in the older age groups, because the transition from exclusive breastfeeding to the introduction of complementary foods is usually a very difficult time for children as the diet is not adequate, and they are also more susceptible to disease. This data therefore demonstrates that younger children were more severely affected than the older groups probably because of poor child caring practice, diseases and/or a serious food crisis.

When comparing the prevalence of GAM in the two major age groups i.e. 6-29 months and 30-59 months of age, there is statistically significant difference in the prevalence of malnutrition (P= 0.0032) as the youngest children are more affected in acute malnutrition. Therefore, the youngest age group 6-29 months was 1.0879 (1.0278-1.1515) times more at risk of malnutrition than the oldest age group 30-59 months. Hence the youngest age groups require more attention in addressing causes of malnutrition.

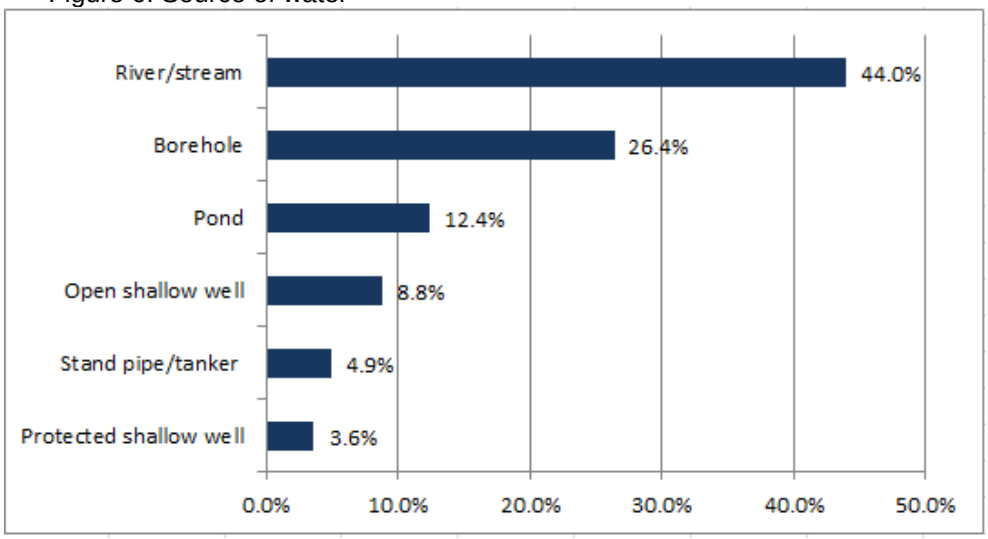
6.0 Water, Hygiene and Sanitation

6.1 Source of drinking water

When asked the main sources of drinking water, a response from the interviewed household indicated that different types of water sources were used in the community that falls into six general categories. As indicated in the figure below the majority two third of the household 65.2% (n= 200) reportedly draw their main source of drinking water from unimproved water source such as river/stream, pond and open shallow well. While 34.9% (n= 107) of the households utilize safe water sources such as borehole, stand pipe or tanker and protected shallow well.

As indicated below the great majority of the households (44.0%, n= 135) source their drinking water from river/stream. AS indicated in the graph below 34.9% (n= 107) households sourced their drinking water from improved source such as borehole/hand pump and protected shallow well and stand pipe/tanker.

Figure 6: Source of water



The current survey finding indicated that the majority 90.2%, (n= 277) mothers/caregivers do nothing to the water collected either from improved or unimproved sources at household level. This shows that water treatment practice in the community is very low and consumption of unsafe water is common.

However, around 8.5% households used different water treatment mechanism to make the water more safe such as utilization of water treatment chemical and boiling. Average amount of water used per household was 64.0 litres on the day prior to the survey. The average number of litres used per person per day was 11.0.

Figure 7: Water treatment

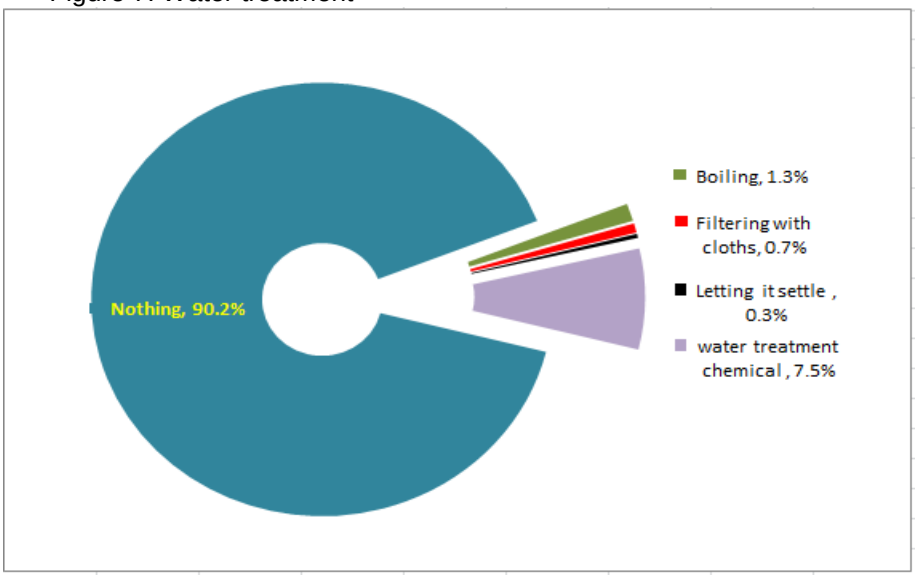
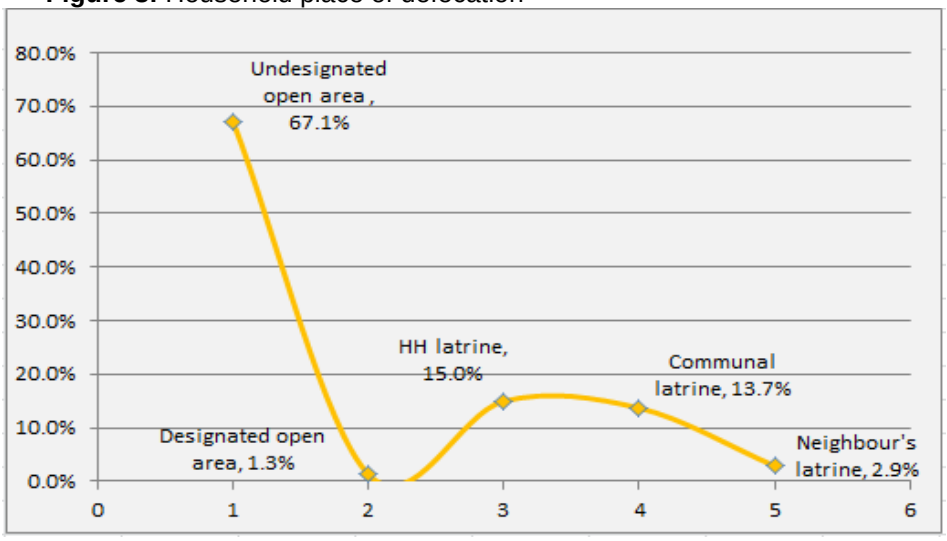
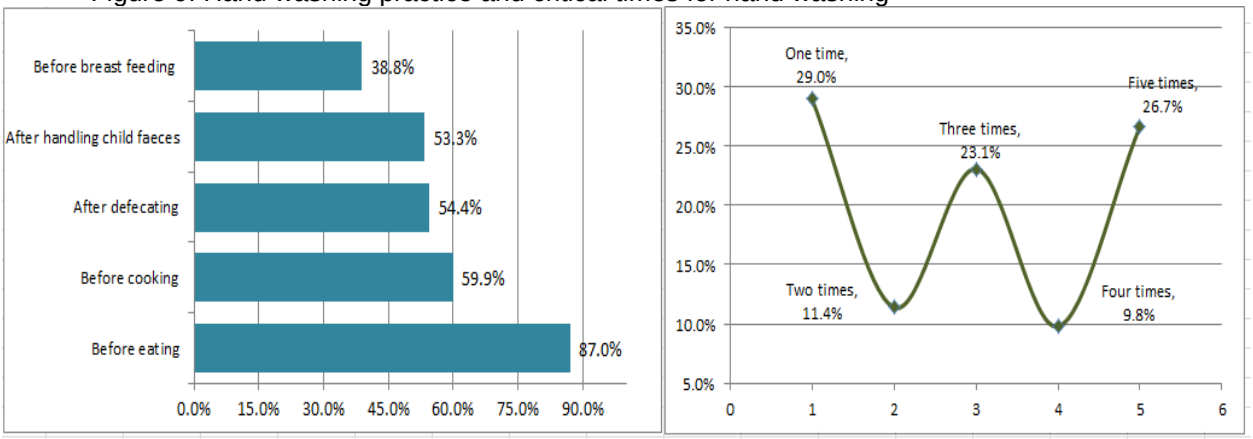


Figure 8: Household place of defecation



A response from the interviewed households indicated that more than two third 67.1% n= 206 households reported using undesignated open area/bush. Whereas 32.9% (n= 101) household reported the possession of pit latrine and households were allowed the team to enter the latrine and complete the observation section of the questionnaire. On the other hand, 17.3% n= 53 of the household have disposal pit inside their compounds.

Figure 9: Hand washing practice and critical times for hand washing



Majority of respondent wash their hands before eating 87.0% (n= 267) followed by before cooking, 59.9% (n= 184), after defecating 54.4% (n= 167) and after handling child faeces 53.3% (n= 163) and before breast feeding 38.8% (n= 119).

Also respondents were asked to identify when they usually wash their hands. As a response around 26.7% (n= 82, 95% CI 21.9-32.1) mentioned all five critical times. More than half (59.6%% n= 183, 95% CI 53.9-65.1) of the respondent reported washing their hands three time and more critical times.

6.2 Infant and young child feeding (IYCF)

Infant and young child feeding practices directly affect the nutritional status of children under two years of

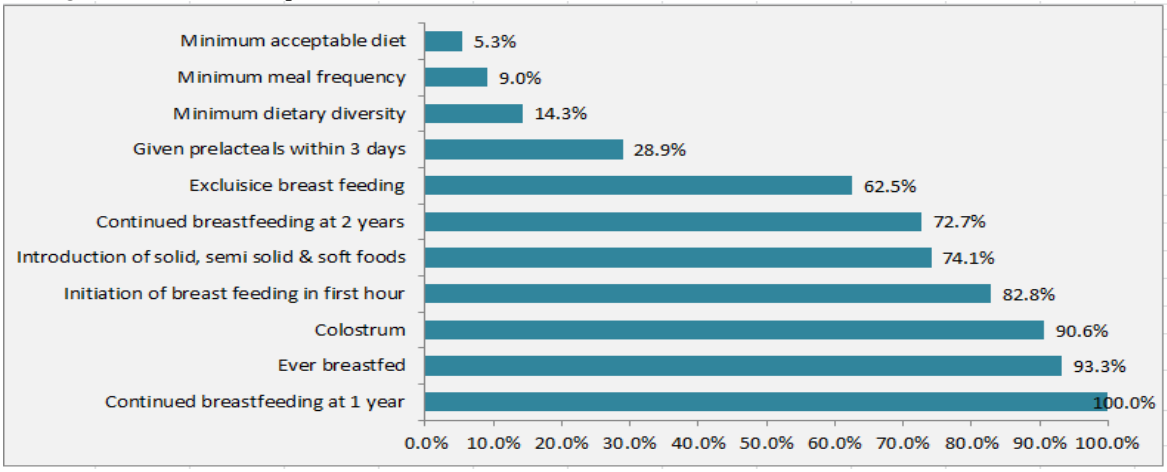
age and, ultimately, impact child survival. Improving infant and young child feeding practices in children 0–23 months of age is therefore critical to improve nutrition, health and development of children. In this survey, IYCF was one of the tools used to assess the infants and young children feeding practices aged 0-23.9 months.

Breast milk is the only food or drink that a new born child needs in the first 6 months of his life. Adhering to the recommendation of exclusive breastfeeding during this period is important to help protect babies from dangerous illnesses. Giving other foods or liquids increases the risk of morbidity as a baby's exposure to pathogens and contaminants is increased. After 6 months, the child can be introduced to appropriate complementary foods, but it is recommended that they should be breastfed until 24 months of age.

Table 21: Summary of breastfeeding practices

Infant and Young Children Feeding practices, N= 180			
Core indicators	Age group	n	%
Early Initiation of breastfeeding (within I hour)	0-23.9m	(149)	82.8% (76.5-88.0)
Exclusive Breastfeeding	0.5,9 m	(20)	62.5% (43.7-78.9)
Continues Breastfeeding at 1 year	12-15 m	(32)	100%
Introduction of solid, semi solids and soft foods	6-8 m	(20)	74.1% (53.7-88.9)
Minimum dietary diversity	6-23.9 m	(19)	14.3% (8.8-21.4)
Minimum meal frequency (Breast fed children)	6-23.9 m	(12)	9.0% (4.7-15.2)
Minimum acceptable diet (breast fed children)	6-23.9m	(7)	5.3% (2.1-10.5
Optional Indicators	Age group	n	%
Child ever Breastfed	0-23.9 m	(168)	93.3% (88.6-96.5)
Continued breast feeding at 2 years	20-23.9 m	(14)	72.7% (49.8-89.3)
Colostrum	0-23.9 m	(163)	90.6% (85.3-94.4)
Given pre-lacteals within 3 days birth	0-23.9 m	(52)	28.9% (22.4-36.1)

Figure 10: Core and optional IYCF indicators



Mothers were asked about breast feeding practice for their younger child between 0-23 months old. In the response, breastfeeding practices are very high with over 93.3% of children breastfed at some

point before 24 months of age. Moreover, more three fourth of the children, 82.8% (n= 149) had reportedly been initiated to breastfeeding immediately within 1 hour. The remaining 17.2% (n= 31) of the children initiated from 1 to 24 hours, 24-48 hour and after 48 hours.

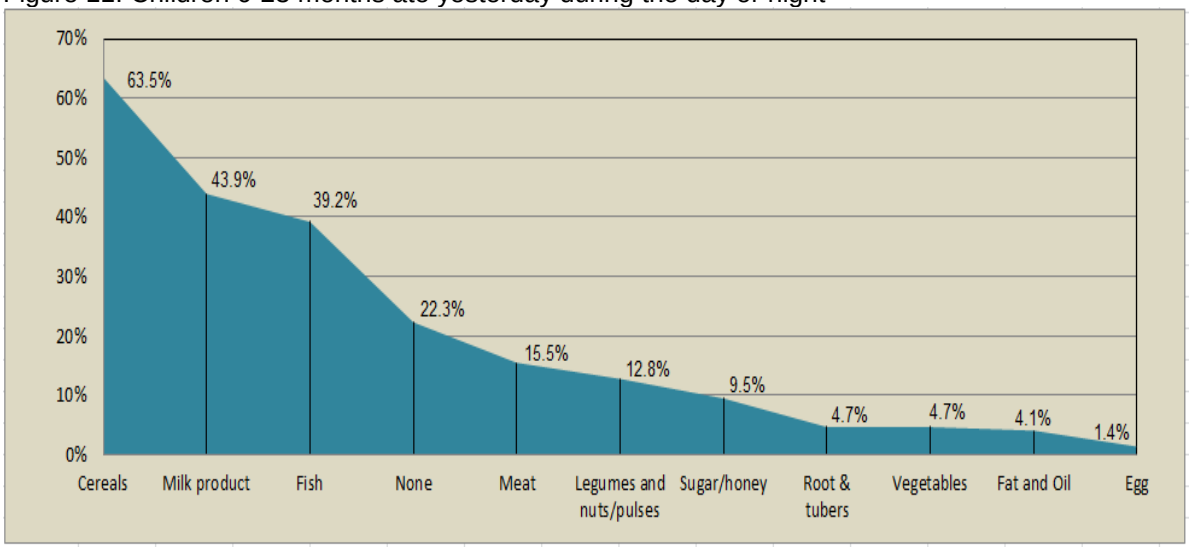
Exclusive breastfeeding rates were analysed for infants below 6 months. Nearly two third of the children below 6 months of age were exclusively breastfeeding (62.5 %), more than quarter of the infants 28.9% (n= 52) had been given pre-lacteals or liquids other than breast milk that potentially expose them to risk of disease. Of those children who received pre - lacteals the majority received sugar and water followed by goat and caw milk and plain water.

Furthermore, 90.6% (n= 163) of the children age 0-23.9 months had been given colostrum, which has immunity properties to improve child survival. In general, breastfeeding practices in terms of not giving of pre-lacteal feeds, and exclusive breastfeeding for under 6 months children were very poor.

Complementary foods should be introduced at six months of age, when breast milk alone is no longer adequate for the child's growth. Young children need at least four meals per day, as they are not able to absorb larger quantities of nutrients in larger meals. On top of this improved feeding of children under two years of age is particularly important because they experience rapid growth and development, and are vulnerable to illness.

The survey result revealed that 74.1% of the children were introduced solid, semi-solid and soft foods between 6-8 months of age whereas the rest of the children were introduced any kinds of food inappropriately. The entire of children (100%) between 12-15 months were continuing to breast feed at 1 year

Figure 11: Children 6-23 months ate yesterday during the day or night



Dietary diversity indicator is based on the premise that the more diverse the diets are the more likely they are to provide adequate levels of a range of nutrients. The minimum dietary diversity was analysed for breast fed children 6-23 months of age. The findings showed that 14.3% (n= 19) of the children had minimum diversified diet while, the majority of the children (85.7% n= 114) were fed below the WHO recommended number of food groups (<4).

Minimum meal frequency for 6-23.9 months of breastfed children was 9.0% whereas minimum acceptable diet was reported to be 5.3%.

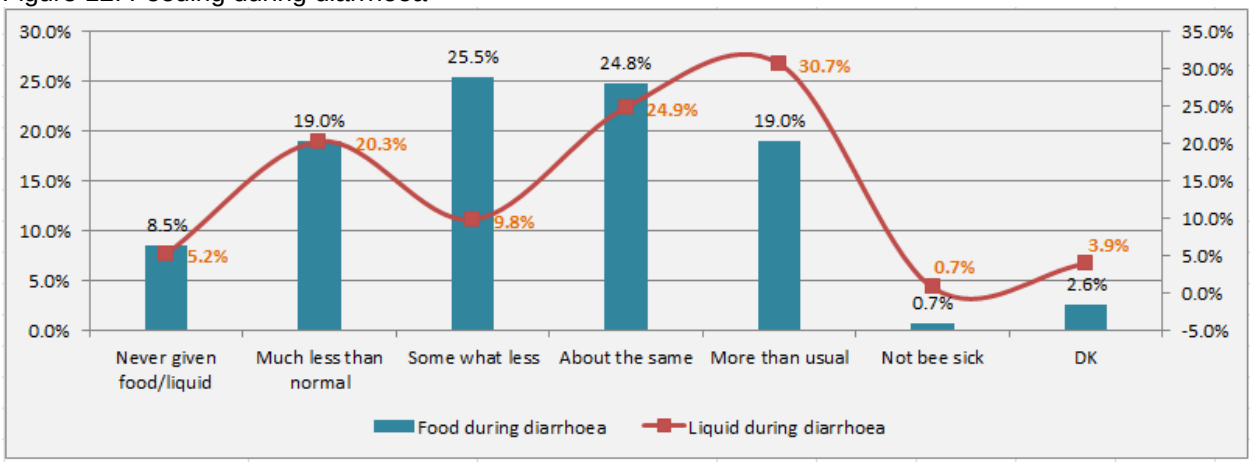
As indicated the majority of the children, the meals did not have an adequate range of food groups and were thus likely to be limited in the diversity of nutrients received. Especially fruits and roots and tubers, vegetables, fat and oil and egg were consumed in very small amount.

In general, the complementary feeding practices and diversity of food that the children consume were inadequate or below the WHO recommended amount.

6.2.1 Feeding during diarrhoea incidence.

Diarrhoea is major cause of under nutrition. This is because nutrient requirements are increased during diarrhoea, just like during other infectious diseases, because nutrient intake and absorption are usually decreased. The knowledge and practice of mother and care givers of under 2 years' old children during the incidence of diarrhoea were assessed.

Figure 12: Feeding during diarrhoea



Mothers and caregivers were asked whether they give more food and liquid or not during diarrhoea incidence. As a response majority of mothers were given less or somehow less or never given food at all and this may contribute to increased cases of severe malnutrition.

Feeding more or about the same food during diarrhoea incidence was reported as 43.8% n= 67 and the amounts of fluids given during diarrhoea incidence more or about the same fluid was 60.1% of the respondents.

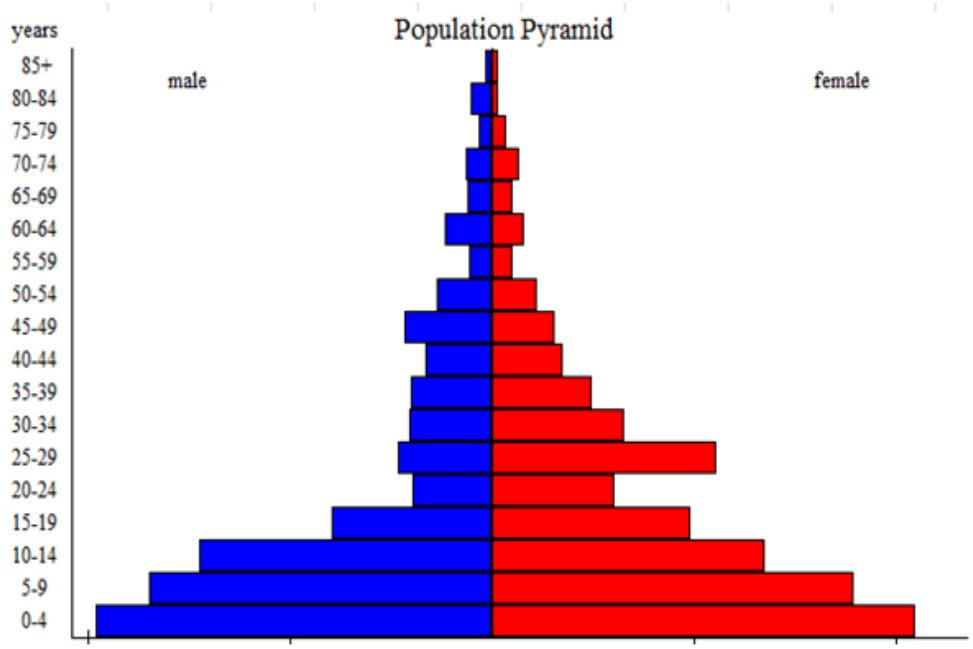
6.3 Food security and livelihood

6.3.1 Demographic data

Table 22: Household demographics taken from demographic and mortality data (N=305):

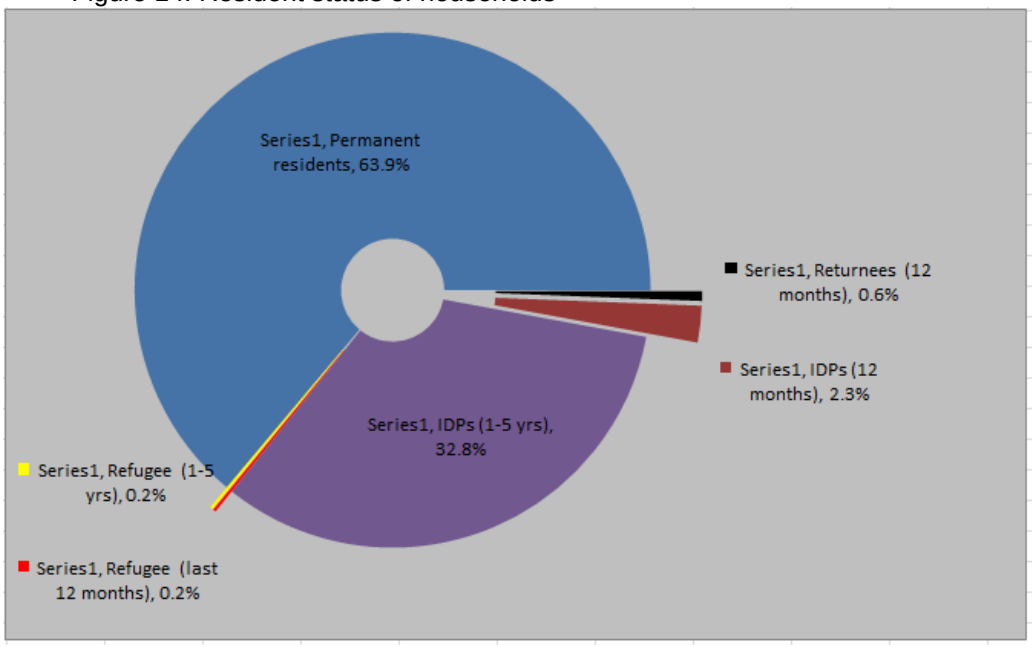
Category	n	%
Females	1456	53.1%
Males	1288	46.9%
Total Population in HHs	**2744**	**100%**
Females, under 5 years	277	51.2%
Males, under 5 years	263.5	48.8%
Total under 5 years in population	**540.5**	**100%**
Female Headed Households	**193**	**40.6%**
Male headed households	**282**	**59.4%**

Figure 13: Population pyramid



6.3.2 Resident status

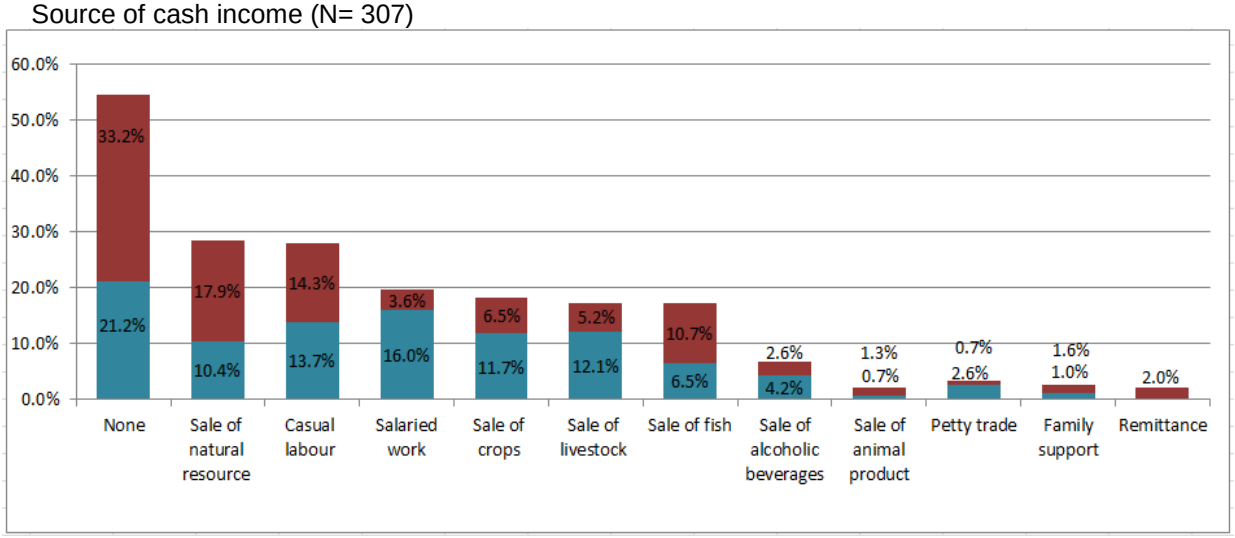
Figure 14: Resident status of households



From the total interviewed households (N= 474) 63.9% of the surveyed population reported resident permanently and 32.8% (n= 156) are IDPs (1-5 years). Whereas the remaining 3.2% (n= 16) of the households describe themselves IDPs (12 months), returnees (12 months), refugee (last 12 months) and refugees (1-5 years).

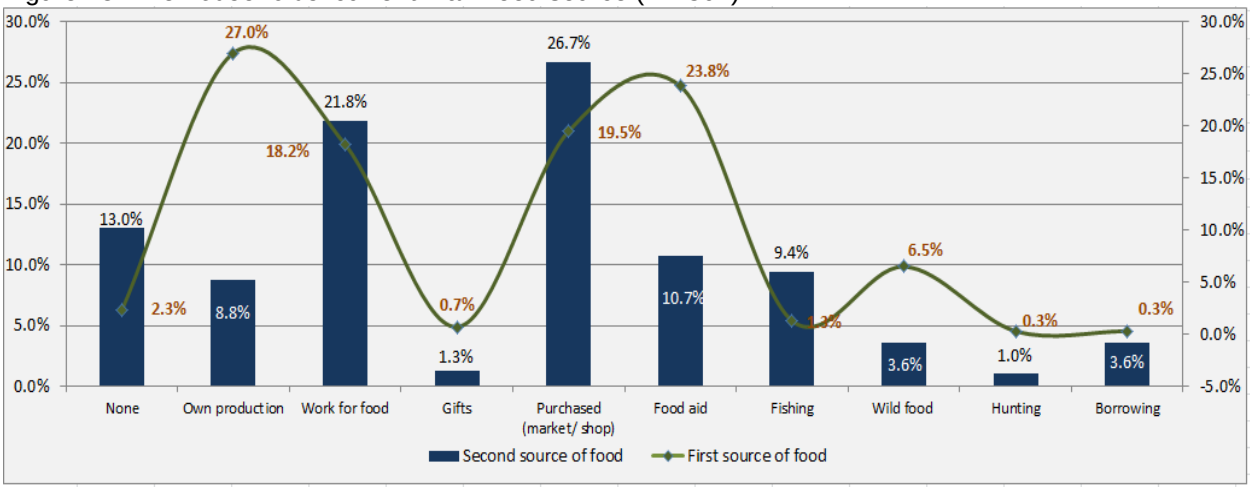
6.3.3 Source of income

Source of cash income (N= 307)



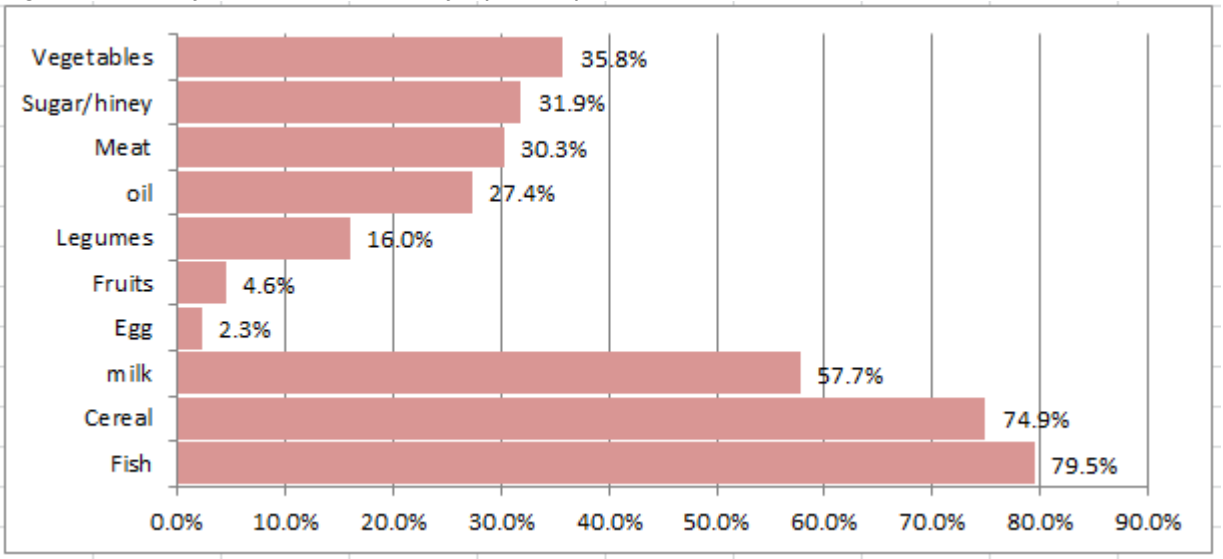
Respondent were asked whether they have cash income or not. As a response 21.2% of the surveyed households informed that they don't have any source of cash income. The survey finding indicated that majority of the households engaged in sale of natural resource followed by casual labour, sale of livestock and crops and sale of fish as a main source of cash income. Very few households also reported sale of alcoholic beverage, sale of animal product, petty trade and family support and remittance as cash income.

Figure 15: The households' current main food source (N= 307)



Based on the analysis, the survey finding revealed that own production (27.0%) followed by food aid (23.8%) and purchase foods from market (19.5%) were the main source of food for the majority of the population. Also purchasing (26.7%) and work for food (21.8%) are described as second means of cash income for the community.

Figure 16: Family food in the last 7 days (N= 307)



The respondent indicated that fish followed by cereal and milk are highly prevalent food the the majority of the household consume seven days prior the survey period. Egg and fruits reported very few households.

From the total interviewed households, 30.6% (n= 94) reported that they cultivated in the current/most recent growing season.

6.4 Conclusion

Nutrition

The prevalence of Global Acute Malnutrition (GAM) based on weight for height z-scores in WHO standard was estimated at 14.3% (95% CI 10.9-18.4) and Sever Acute Malnutrition (SAM) was estimated at 1.0%.(95% CI 0.4-2.3).

This level of Global Acute Malnutrition (14.3%) is below the emergency threshold of 15.0%. However with the aggravating factors of poor food security situation at household level, poor access to improved water source and hygiene and sanitation the level of acute malnutrition can be classified as **serious.**

The prevalence of severe acute malnutrition of 1.0% is high and should be viewed with caution since there are high numbers of moderately malnourished cases near to the severe cut off and that can easily fall into the severe category and push the prevalence of SAM to a higher level. Programmatic responses need to consider children classified as severely malnutrition.

Infant and young children feeding practice

Breastfeeding practices are very high with over 93.3% of children breastfed at some point before 24 months of age. More three fourth of the children, 82.8% (n= 149) had reportedly been initiated to breastfeeding immediately within 1 hour. The remaining 17.2% (n= 31) of the children initiated from 1 to 24 hours, 24-48 hour and after 48 hours.

Nearly two third of the children below 6 months of age were exclusively breastfeeding (62.5 %).

More than quarter of the infants 28.9% (n= 52) had been given pre-lacteals or liquids other than breast milk that potentially expose them to risk of disease. Of those children who received pre - lacteals the majority received sugar and water, goat and caw milk and plain water.

About 90.6% (n= 163) of the children age 0-23.9 months had been given colostrum, which has immunity properties to improve child survival.

The survey result revealed that 74.1% of the children were introduced solid, semi-solid and soft foods between 6-8 months of age whereas the rest of the children were introduced any kinds of food inappropriately. The entire of children (100%) between 12-15 months were continuing to breast feed at 1 year

The minimum dietary diversity 14.3%, minimum meal frequency reported 9.0% and minimum acceptable diet was 5.3%.

Morbidity

From the total sample children 6 to 59 months, 51.8% (n= 265) children had been ill in the fourteen days period prior to the survey date. Fever/malaria, diarrhoea and cough/difficulty of birthing were the most

common illnesses reported. Further, skin and eye infection were other common childhood illnesses reported.

Of those sick children, more than three fourth of the children 83.0% (n= 220) were taken to health facility for treatment such as hospital, PHCC and mobile clinics. Whereas about 12.8% (n= 34) of them were not taken to health facility for treatment for their illnesses. The majority of mothers and care givers were taken their children to PHCC.

Water sanitation and hygiene

Nearly half of the households (44.0%, n= 135) source their drinking water from river/stream and around 34.9% (n= 107) households sourced their drinking water from improved water sources such as borehole/hand pump and protected shallow well and stand pipe/tanker.

Majority 90.2%, (n= 277) mothers/caregivers do nothing to the water collected either from improved or unimproved sources at household level. This implies that a water treatment practice in the community is very low and consumption of unsafe water is common.

More than two third 67.1% n= 206 households reported using undesignated open area/bush. Whereas 32.9% (n= 101) household reported the possession of pit latrine.

Around 26.7% (n= 82, 95% CI 21.9-32.1) mentioned all five critical times. More than half (59.6%% n= 183, 95% CI 53.9-65.1) of the respondent reported washing their hands three or more critical times.

7.0 Recommendations

- *GOAL should Scale up targeting of acutely malnourished children through the ongoing nutrition intervention program in the County and improve active case finding until household food security is restored and critical public health issues are addressed.*

- *Eexpand coverage for nutrition and other health programs in all health facilities,*
- *Integration of nutrition with Integrated Community Case Management (ICCM) for effective management of SAM and treatment at community level of childhood illnesses.*

- *Strengthen the community mobilization activities by involving the community to own the program in active case finding, defaulter tracing, home visits and follow up of the children and through regular review meeting.*

- *Strengthen the Integrated Community Case Management (ICCM) for effective management of SAM and treatment at community level of childhood diseases.*

- *Morbidity related with poor hygiene and sanitation and illness caused poor water treatment practice especially households access their water from unimproved water sources. So there should be a promotion activity through hygiene promoters addressing hand-washing practices, diarrhoea management skills and others.*

- *Hygiene and sanitation practices are poor and households who have access to latrines are low. Therefore, provision of sanitary facilities including construction of latrines and waste disposal pit at household level should be strengthened especially in host community.*
- *Strengthen water, sanitation and hygiene practices including water treatment and proper disposal of human faecal waste to avoid contamination of water sources.*

- *Since the area is considered malaria endemic, strengthen the support for LLITN distribution and awareness raising campaigns to promote effective utilization of bed nets especially for children under five and PLW.*
- *There is limited diversity in terms of diets taken. In order to improve the dietary diversity and nutritional status of the population, nutritional education and promotion of fruits and vegetables and roots and tubers and other nutritious food should be widely introduced and demonstrate for the community. .*

- *There is a need to focus on programs that improve and sustain dietary diversity and consumption of micronutrient rich foods.*

- *Strengthen introduction of small gardens to promote production and consumption of vegetables may also enhance dietary diversity and increase the intake of vitamins and minerals rich foods.*

- *Efforts should be put to support the livelihood for the population such as promoting strategies that would help improve household food security. These may include supporting agro pastoral community with farming inputs such as seeds and tools and advocate practicing alternative livelihood options in pastoral community.*

Appendix 1: Result Tables for NCHS growth reference 1977

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	512	-1.31±0.72	1.25	0	0
Weight-for-Age	512	-1.49±0.92	1.21	0	0
Height-for-Age	498	-0.72±1.20	1.00	0	14

* contains for WHZ and WAZ the children with edema.

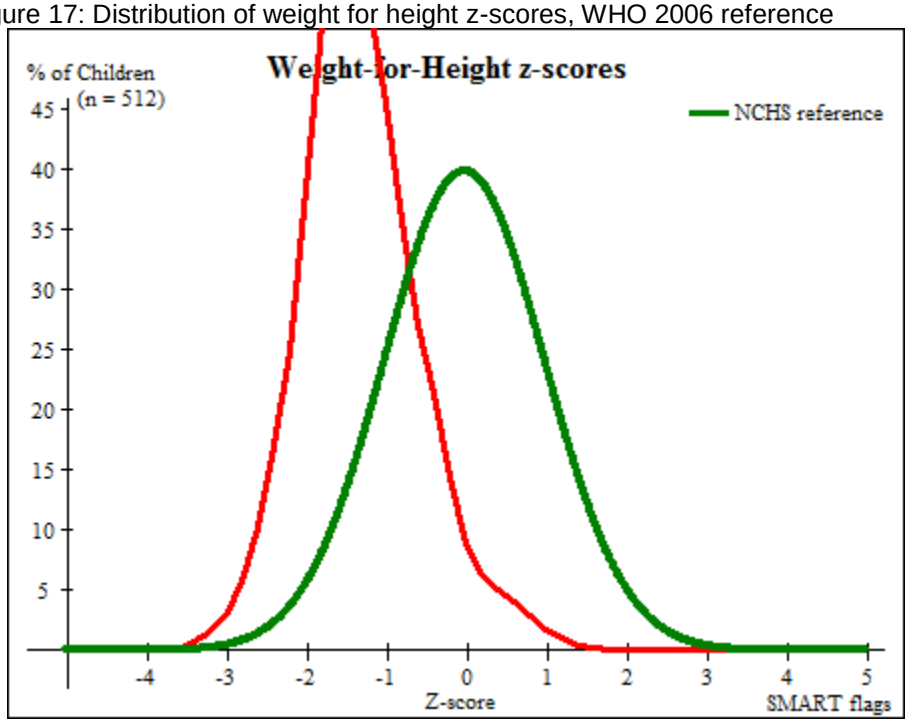
Acute Malnutrition

Prevalence of acute malnutrition based on WHZ (and/or oedema) and by sex

	All n = 512	**Boys** n = 257	**Girls** n = 255
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(76) 14.8 % (11.6 - 18.8 95% CI)	(38) 14.8 % (10.9 - 19.7 95% CI)	(38) 14.9 % (10.5 - 20.7 95% CI)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(72) 14.1 % (10.9 - 17.9 95% CI)	(35) 13.6 % (9.8 - 18.7 95% C.I.)	(37) 14.5 % (10.2 - 20.3 95% CI)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.8 % (0.3 - 2.1 95% C.I.)	(3) 1.2 % (0.4 - 3.6 95% C.I.)	(1) 0.4 % (0.1 - 2.9 95% CI)

The prevalence of oedema is 0%

Figure 17: Distribution of weight for height z-scores, WHO 2006 reference



Chronic Malnutrition

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

	All n = 498	Boys n = 251	Girls n = 247
Prevalence of stunting (<-2 z-score)	(73) 14.7 % (11.7 - 18.1 95% C.I.)	(38) 15.1 % (11.6 - 19.5 95% CI)	(35) 14.2 % (10.4 - 19.1 95% CI)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(57) 11.4 % (9.0 - 14.4 95% C.I.)	(30) 12.0 % (8.9 - 15.9 95% C.I.)	(27) 10.9 % (7.9 - 14.9 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(16) 3.2 % (1.8 - 5.5 95% C.I.)	(8) 3.2 % (1.7 - 5.9 95% C.I.)	(8) 3.2 % (1.5 - 6.7 95% C.I.)

Underweight

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

	All n = 512	Boys n = 257	Girls n = 255
Prevalence of underweight (<-2 z-score)	(148) 28.9 % (24.7 - 33.6 95% CI)	(71) 27.6 % (22.5 - 33.5 95% CI)	(77) 30.2 % (23.8 - 37.5 95% CI)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(130) 25.4 % (21.4 - 29.8 95% CI)	(63) 24.5 % (19.5 - 30.3 95% CI)	(67) 26.3 % (20.3 - 33.3 95% CI)
Prevalence of severe underweight(<-3 z-score)	(18) 3.5 % (2.4 - 5.2 95% CI)	(8) 3.1 % (1.7 - 5.7 95% CI)	(10) 3.9 % (2.2 - 7.0 95% CI)

Appendix 2: **Plausibility check**

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.0 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.930)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.387)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (6)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (6)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**10** (0.83)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (0.31)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (0.32)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.422)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**12** %

The overall score of this survey is 12 %, this is good.

Appendix 3: Report for Evaluation of Enumerators

Weight:

	Precision: Sum of Square [W1-W2]	Accuracy: Sum of Square [Enum.(W1+W2)-(Superv.(W1+W2)]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.01		0/1	
Enumerator 1	0.01 OK	0.02 OK	1/0	1/1
Enumerator 2	0.32 POOR	0.49 POOR	4/1	0/7

Enumerator 3	0.01 OK	0.04 POOR	1/0	0/1
Enumerator 4	0.02 OK	0.31 POOR	2/0	0/5
Enumerator 5	0.00 OK	0.17 POOR	0/0	0/3
Enumerator 6	1.38 POOR	1.63 POOR	2/1	1/3
Enumerator 7	0.01 OK	0.02 OK	1/0	0/2
Enumerator 8	0.00 OK	0.29 POOR	0/0	1/2
Enumerator 9	4.01 POOR	4.16 POOR	1/1	1/1
Enumerator 10	0.01 OK	0.00 OK	1/0	0/0
Enumerator 11	0.01 OK	0.00 OK	1/0	0/0
Enumerator 12	0.00 OK	0.01 OK	0/0	0/1

Height:

	Precision: Sum of Square [H1-H2]	Accuracy: Sum of Square [Enum.(H1+H2)-Superv.(H1+H2)]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.03		2/1	
Enumerator 1	0.05 OK	0.22 POOR	3/2	4/3
Enumerator 2	0.06 OK	0.03 OK	2/1	0/3
Enumerator 3	0.02 OK	0.05 OK	2/0	1/1
Enumerator 4	0.03 OK	5.40 POOR	1/2	2/4
Enumerator 5	0.04 OK	0.05 OK	4/0	0/2
Enumerator 6	0.01 OK	0.30 POOR	1/0	1/5
Enumerator 7	0.07 POOR	9.48 POOR	3/1	1/7
Enumerator 8	0.04 OK	4.83 POOR	2/2	2/5
Enumerator 9	0.03 OK	0.02 OK	2/1	0/2
Enumerator 10	0.04 OK	9.89 POOR	3/1	1/4
Enumerator 11	0.04 OK	0.05 OK	3/1	0/2
Enumerator 12	0.03 OK	0.14 POOR	2/1	0/3

MUAC:

	Precision: Sum of Square [MUAC1-MUAC2]	Accuracy: Sum of Square [Enum.(MUAC1+MUAC2)-Superv.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.02		1/1	
Enumerator 1	0.00 OK	0.02 OK	0/0	1/1
Enumerator 2	0.03 OK	0.01 OK	1/2	0/1
Enumerator 3	0.00 OK	0.02 OK	0/0	1/1
Enumerator 4	0.01 OK	23.23 POOR	1/0	1/4
Enumerator 5	0.02 OK	6.82 POOR	1/1	5/2
Enumerator 6	0.03 OK	0.03 OK	2/1	0/3
Enumerator 7	0.05 POOR	2.19 POOR	2/3	5/3
Enumerator 8	0.04 POOR	7.68 POOR	3/1	5/5

Enumerator 9	0.00 OK	0.02 OK	0/0	1/1
Enumerator 10	0.04 POOR	0.76 POOR	3/1	3/5
Enumerator 11	0.03 OK	0.07 POOR	1/2	1/3
Enumerator 12	0.03 OK	4.89 POOR	2/1	2/2

Appendix 4: Cluster assignment

Bom	300	
Akot	270	
Thapiou	550	
Aghok	644	1
Majak	150	
Awuwenglok	700	
Achuar	1500	2
Wunkiir	600	
Themngol	100	
wunchol	400	3
Luanding	300	
Adol	900	
Balagat	100	
Anompei	150	
Gor	200	4
Dhonglonyagor	75	
Athieng	300	
Agordit	100	
Tonygor	250	
Wun barkou	175	
Leweng	75	
Dong 1	100	
Dong 2	100	
Panamdit	1500	5
Panamthii	750	6
Liet	200	
Mading	150	
Malek	500	

Balgo	200	
Nyayok	250	
Nyikomi	300	
Arinypiny	550	7
Yolwut	200	
Nyongwut	750	
Thiangrial	1000	8
Chatony	350	
Duki	100	
Chuei	200	
Aguetker	2500	RC,9
Muongdor	1000	
Mioriok	3000	10,RC
Gakbany	1500	11
Paloch	3500	12,13
Goy	1000	14
Pariak	2000	15
Thak	1550	16
Bimachuk	1000	
Mabil	3500	17,18
Pochbei	1750	19
Moleetal	2500	20,21
Padiet	1000	
Mat	1500	RC
Tiep	750	22
Wunthon	500	
Melut	1450	23
Dotkobay	1000	
Hai-mataar	750	24

Hai- Agok	750	
zone1	455	
zone1	310	25
zone2	150	
zone3	235	
zone1	250	
zone2	400	
zone3	475	
zone1	490	RC
zone2	480	
zone3	1600	26
zone1	422	
zone2	500	
zone1	423	27
zone2	200	
zone3	900	
zone4	750	28
zone1	556	
zone2	514	
zone1	596	29
zone2	564	
zone1	690	
zone2	660	30
zone1	794	
zone2	766	31
zone1	853	
zone2	870	32
zone1	300	
zone2	350	
zone1	516	
zone2	510	33
zone3	524	
zone1	387	
zone2	391	34
zone3	388	
zone4	384	
zone1	258	

zone2	260	
zone3	291	
zone4	300	35
zone5	435	
zone6	600	
zone1	395	
zone1	207	36

Appendix 5: Seasonal and event calendar

Seasonal and event calendar, Melut SMART Survey May 2016

Months	Season	2011	Age	2012	Age	20013	Age	20014	Age	2015	Age	2016	Age
January	**Dry season**: migration of livestock to river back.			**Dry season**: migration of livestock to river back.	51	**Dry season**: migration of livestock to river back.	39	Registration of IDPs in Pagak	27	**Dry season**: migration of livestock to river back.	15	**Dry season**: migration of livestock to river back.	3
February	**Dry season**: migration of livestock to river back.			**Dry season**: migration of livestock to river back.	50	**Dry season**: migration of livestock to river back.	38	**Dry season**: migration of livestock to river back	26	**Dry season**: migration of livestock to river back.	14	**Dry season**: migration of livestock to river back.	2
March	**Dry season**: migration of livestock to river back.			**Dry season**: migration of livestock to river back.	49	**Dry season**: migration of livestock to river back.	37	**Dry season**: migration of livestock to river back.	25	**Dry season**: migration of livestock to river back.	13	**Dry season**: migration of livestock to river back.	1
April	Rain began			Rain began	48		36	Rain began	24	Rain began	12	Rain began	0
May	Rain season		59	Rain season	47		35	Rain season	23	Rain season	11	Rain season	
June	Rain season		58	Rain season	46		34	Rain season	22	Rain season	10	Rain season	
July	July 9 : Independence day		57		45		33		21		9		
August			56		44		32		20		8		
Sep	Harvesting time		55	Harvesting time	43		31	Harvesting time	19	Harvesting time	7	Harvesting time	
Oct			54		42		30		18		6		
Nov			53		41		29		17		5		
Dec	Christmas		52	Christmas	40	War broken out in Juba	28	Christmas	16	Christmas	4	10th December 2015 (Two weeks prior to Christmas)	

Appendix 6: Survey Questionnaires

ANTHROPOMETRIC & HEALTH QUESTIONNAIRE

To be conducted in EVERY SELECTED HH with children 6-59 months

Date (DD/MM/YY): …./……/…..... Cluster No:…… Team No…..… State:…….. County……..…….. Payam:……. Boma……..……..
Village:……...……

1	2	3	4	6	7			8	9	10	11	12		13	14	15	16	
Child No.	HH No.	Child Name	Sex 1 = Male 2= Female	Age in months	Weght in kg (eg 12.4)	Height in cm (eg 88.1)	MUAC in cm (eg 11.3)		Oedema 0= No 1= yes		Vitamin A in the last 6 mths Children 6-59 months --------- 0 = No 1 = Yes, card 2= Yes, mother 3= DK	Measles Vaccine Children >= 9 months ---- 0 = No 1 =Yes, card 2=Yes, mother 3= DK	Dewormed in the last 6 months Children 12-59 months ---- 0 = No 1 =Yes, card 2= Yes, mother 3= DK	Has the child been ill in the last two weeks (14 days)? 0 = No 1 =Yes If no, go to 16	If yes, type of Illness 1 = Fever 2 = Diarrhoea 3 = Cough 4= Skin infection 5= Eye infection 6= Blood instool 7= Measles 8 = Other (specify)	Treatment ght: Not sought Hospital PHCC/U Mobile /outreach clinic CBD rivate clinic raditional practitioner harmacy/chemist ther (Specify)		Last night, did the child sleep under a mosquito net (LLITN) ? ---------- ------ 0= No 1= Yes
1	1																	
2	2																	
3																		
4																		
5																		

DEMOGRAPHY AND MORTALITY QUESTIONNAIRE

Team Number [ ]	**Date**	**Cluster No. [ ]**
Area	**Village**	**HOUSEHOLD[7] NO. [ ]**

01	02	03	04	05	06	07	08	09	10
No.	Name	Sex (M/F)	Age (years)	Joined on or after:	Left on or after:	Born on or after:	Died on or after:	Cause of death (optional)	Location of death (optional)
				WRITE 'Y' for YES. Leave BLANK if NO.					
a) List all the household members that are **currently living** in this household.									
1									
2									
3									
4									
5									
6									
7									
12									
13									
b) List all the household members that have **left this household** (out migrants) **since the start** of the recall period.									
1					Y				
2					Y				
3					Y				
4					Y				
5					Y				
c) List all the household members who **died** since the start of the recall period.									
1							Y		
2							Y		
3							Y		
4							Y		

Causes of death

No.	Disease	No.	Disease	No.	Disease	No	Disease
1	Unknown	5	ARI/Pneumonia/Cough (difficulty of birthing)	9	Violence related	13	Meningitis
2	Injury/ Traumatic	6	Malnutrition	10	Neonatal Mortality	14	Old age
3	Diarrhoea	7	Measles	11	Acute Flaccid Paralysis (Polio)	15	Unknown
4	Fever (Malaria)	8	Accident	12	Maternal Mortality	16	Other (specify)

[7] Insert the household definition used in the survey in footnote here.

INFANT AND YOUNG CHILD FEEDING (0-23 Months)

11.4	11.5	11.6	11.8 Yesterday, during the day or at night, did [NAME] receive any of the following liquids?								11.8 Describe what did (NAME) eat yesterday during the day or night, whether at home or outside the home since (NAME) woke up yesterday until NAME went to sleep? a) Think about when (NAME) first woke up yesterday. Did (NAME) eat anything at that time? If yes: Please tell me everything (NAME) ate at that time. (Probe: Anything else? Until respondent says nothing else. If no, continue to Question b). What did (NAME) do after that? Did (NAME) eat anything at that time? If yes: Please tell me everything (NAME) ate at that time. Probe: Until respondent says nothing else. Repeat question b) above until respondent says the child went to sleep until the next day. Note whenever the child ate a food or drink from the food groups								
Has [NAME] ever been breastfed? (EverBF) 1= Yes 0 = No 2 =DK	How long after birth did you first put [NAME] to the breast? 1 = Less than one hour 2 = b/n 1 and 23 hours 3 =More than 24 hours	Is (Name) still breastfeeding now? 1= Yes 0 = No 2= DK	11.7	11.7.1	11.7.2	11.7.3	11.7.4	11.7.5	11.7.6	11.7.7	11.8	11.8.1	11.8.2	11.8.3	11.8.4	11.8.5	11.8.6	11.9	11.10
			Plain water 1= Yes 0 = No 2= DK	Infant formula 1= Yes 0 = No 2 = DK	Milk such as tinned, powdered, or fresh animal milk 1= Yes 0 = No 2= DK	Sour milk or Yoghurt 1= Yes 0 = No 2= DK	Juice or juice drinks 1= Yes 0 = No 2= DK	clear Broth 1= Yes 0 = No 2= DK	Thin Porridge 1= Yes 0 = No 2= DK	Other water base liquids 1= Yes 0 = No 2= DK	Cereals, flours, grains, roots and tubers 1= Yes 0 = No 2 = DK	legumes and nuts (Beans, Peas, Lentils, Nuts and Seeds) 1= Yes 0 = No 2= DK	dairy products (milk, yogurt, cheese) 1= Yes 0 = No 2 = Don't know	flesh foods (meat, fish, poultry and liver/organ meats) 1= Yes 0 = No 2= DK	eggs 1= Yes 0 = No 2 = DK	vitamin-A rich fruits and vegetables (carrot, red pepper, pumpkin, Ripe Mangoes, papaya 1= Yes 0 = No 2 = DK	other fruits and vegetables (Avocado, Banana, Appile, Grapes, Guava, Lemon, Pinappeal e, Cabbage, onions, tomatoes, etc 1= Yes 0 = No 2 = DK	How many times did [child's name] eat solid or semi-solid food other than liquids yesterday during the day or at night? (number of times)	Yesterday during the day/night, did [child's name] consume any food given by a health centre for the treatment of malnutrition (Plumpy'Nut, Plumpy' sup, Plumpy'Nut dose sprinkles/sachet etc) OR fortified food (porridge consisting of several meal mixed, CSB OR any food with added a micronutrient powder(MNP)? 1= Yes 0 = No 2 = Don't know

Food security and Livelihood OOD SECURITY AND LIVELIHOOD QUESTIONNAIRE

(continue questionning HH's where we've collected Anthro' & Health information)

Date (D/M/Y): ……./……./…..... Cluster No:…… Team No…..… State:…….. County……..…….. Payam:……. Boma……..……..
Village:……...……

	18	19	20	21	22	23	24	25	26	27	28
HH No*	HH size (No. of people living in HH)	Resident status of HH: ---------- 1: Permanent residents, 2: Returnees (returned within the last 12mths) 3: Nomads 4: IDPs (in last 12 months) 5: IDPs (1-5yrs) 6: IDPs (5yrs +) 7: Refugees (in last 12mths) 8: Refugees (1-5yrs) 9: Refugees (5yrs +) 10: DK	Is there any IDP or returnee currently livng in your household ? --------- 0 = No 1 = Yes	Is the HH head male or female? --------- 1 = Male 2 = Female	What was your HHs main source of income in the last 30 days? --- 1 = Sale of crops 2 = Sale of livestock 3 = Sale of animal product 4= Sale of alcoholic beverages 5 = Sale of fish 6 = Sale of natural resources (firewood; charcoal; grass) 7 = Sale of food aid 8 = Casual Labour 9 = Skilled labour 10 = Salaried work 11 = Petty trading 12 = Family support 13= Remitance 14=others (Specify)	What did your familly eat in the last 7 days? (include more than one if necessary) (Tom to Revise based on the standard) ---------- 1 = Cereals Roots and Tubers 2 = Legumes/nuts 3 = Meat /Poultry/Offals 5 = Fish & sea foods 6 = Milkl & Milk Products 7 = Vegetables 8 = Fruits 9 = Eggs 10 = Oil/ Fats 11 = Sugar & honey 12 = None	What was the main source of food in the past 7 days --------- 1 =Own production 2 =Work for food 3 =Gifts from neighbours 4 =Market/shop purchase 5 =Borrowing/debts 6 =Food aid 7= Hunting 8 = Fishing 9 = Gathering 10= Others	Did you cultivate in the recent last season? --------- 0 = No 1 = Yes	Does the HH own any livestock, heards or farm animals ? --------- 0 = No 1 = Yes	Has your HH received any Humanitarian Assistance in the past 3 months? --------- 0 = None 1 = GFD 2= School meals /feeding 3=TFP/SFP 4 = Seeds & tools 5=Fishing kits	What is the main shock currently faced by the HH ---------- 1 = Insecurity /violence 2 = Food too expensive /increased price 3 = Livestock diseases 4 = Floods 5 =Human sickness 7 =Returnee/IDP living with HH 8 =Late food distribution 9 = Social event 10 = Delay of rains 11 = Weeds/ Pest 12= Other(specify)

WATER AND SANITATION QUESTIONNAIRE

Date (D/M/Y): …./……./…..... Cluster No:…… Team No…..… State:…….. County……..…….. Payam:…… Boma……..…... Village:……...……

	26	27	28	29	30	31	32	33
HH Ref No.	What is the household's main drinking source of water ? --- 1=Borehole/hand pump 2= Protected Shallow well 3= Open shallow well 4= Protected spring 5= River /Stream 6= HH connection / Stand pipe /Tanker 7= Dam / Pond 8= Other (specify)	How long does it take to collect HH water (including travel to and from and waiting)? --- 1 = ≤30 min 2 = >30min to ≤1hr 3 = >1hr to ≤ 2hr 4 = more then 2 hr	How many jerricans of water did the HH use yesterday in total (excluding water for washing clothes and for animal)? (define how many litres in a jerrycan if the popn all use the same)	What is done to the water before households members drink it? --- 0 =Nothing 1 =Boiling 2 =Filtering with a cloth 3 =Letting it settle 4 =Water treatment chemicals 5 =Others(Specify)	When do you usually wash your hands (more than one if appropriate - do not prompt) --- 0 = Never 1 = After defecating 2 = Before cooking 3 = Before eating 4 = Before feeding the baby 5=Affter cleaning the baby 6=other (specify)	What do you use to wash hands? --- 0 = Nothing 1 = Water only 2 = Water + Soap 3 = Water + Ash 4 = other (specify)	Where does the household usually use the toilet (include more than one if necessary)? --- 1 = Undesignated open area 2 = Designated open area 3 = Hole 4 = Latrine 5 = Other (specify)	Do you have waste disposal pit in you compound? 0= No 1= Yes 3= DK