Food Security and Nutrition Assessment in Karamoja Region

By

Dr Henry Wamani

School of Public Health

Makerere University College of Health Sciences

January 2014

P.O. Box 7072 Kampala

Tel: 0776655000 or 0755443300

Email: hwamani@musph.ac.ug; wamanih@gmail.com

Table of content

Acknowledgment

List of Tables

List of figures

Summary of findings

- The overall prevalence of GAM among children 6-59 months in Karamoja region was 11.0%, 95% CI (9.9 – 12.3). Prevalence was similar with the May 2013 survey where GAM was 12.5%, 95% CI (11 – 14)

District (6-59 months)	GAM	SAM	Stunting	Underweight
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Abim (N=311)	5.5 (3.5- 8.7)	1.0 (0.3 - 2.8)	34.6 (29.5 - 40.1)	18.9 (14.9 - 23.6)
Amudat (N=308)	9.2 (6.4 - 12.9)	4.9 (2.2 - 6.7)	30.5 (25.3 - 36.4)	23.0 (18.4 - 28.5)
Kaabong (N=291)	14.2 (11.2 - 17.9)	3.4 (2.0 - 5.6)	40.6 (36.0 - 45.5)	34.8 (30.3 - 39.6)
Kotido (N=400)	10.5 (7.8 - 13.9)	3.8 (2.3 - 6.2)	39.0 (34.3 - 43.9)	25.9 (21.8 - 30.5)
Moroto (N=453)	16.0 (12.9 - 19.6)	4.1 (2.6 - 6.3)	43.6 (39.0 - 48.2)	34.2 (30.1 - 38.8)
Nakapiripirit (N=348)	10.3 (7.5 - 13.9)	2.1 (1.0 - 4.2)	30.2 (25.5 - 35.3)	25.5 (21.2 - 30.4)
Napak (N=405)	8.2 (5.8 – 11.3)	2.8 (1.6 – 5.0)	37.9 (33.2 – 42.8)	24.5 (20.5 – 29.0)
Combined (N=2561)	11.0 (9.9 – 12.3)	3.5 (2.9 – 4.3)	37.6 (35.8 – 39.5)	27.5 (25.8 – 29.2)

- There was a statistically significant relationship between GAM, stunting, severe stunting, underweight and sex. In all indicators boys were more affected than girls. That is, 13.2%, 95% CI (11.4–15.2) Vs 8.9%, 95% CI (7.5 – 10.5) for GAM; 40.3%, 95% CI (37.6 - 43.0) Vs 34.6%, 95% CI (32.1 - 37.2) for stunting and 18.3% (16.2 - 20.5) Vs 12.9% (11.2 - 14.8) for severe stunting; and 30.7% (28.2 - 33.3) Vs 24.5% (22.2 - 26.8) for underweight

- Anemia was rampant among children 6-59 months with 64.0% of the children anemic

District	Severely Anemia	Moderately Anemia	Mildly Anemic	Not Anemic
	%	%	%	%
Abim (N=247)	2.4	39.3	23.5	34.8
Amudat (N=242)	4.1	35.1	21.9	38.8
Kaabong (N=315)	3.5	33.7	21.9	41.0
Kotido (N=360)	1.9	31.9	28.6	37.5
Moroto (N=340)	3.5	33.2	26.2	37.1
Nakapirit (N=327)	4.0	41.3	23.5	31.2
Napak (N=430)	3.0	38.6	25.3	33.0
Combined (N=2261)	3.2	36.1	24.7	36.0

- Likewise more than 43.4% of the women 15 -49 years in all districts were anemic. Nakapiripirit had the highest prevalence of anemia in women (54.7%)

- Up to 23.1% of the mothers 15-49 years were underweight, and only 2.1% were overweight or obese while and 74.8% were of normal Body Mass Index (BMI).

- Exclusive breastfeeding rate among infants less than 6 months was above 90% in most districts except Amudat (71.1%) and Kotido (78.7%). However quality of complementary feeding was poor with 90% of the children having fed on less than four food groups the previous day of survey

- Up to 450 (17.3%) of the sampled children were currently enrolled in feeding programs (SFP/TFP). However, a larger proportion of children with GAM (67.6%) and underweight (73.5%) were not participating in any feeding program. That could indicate delayed intervals of community level screening or lack of sensitivity of the MUAC screening method or it could be possible that the feeding programs were not adequately targeting the right children. Problems of equity commonly occur with targeted programs where the most marginalized fail to access the program while those who may not necessarily need the services access them easily. This calls for a careful evaluation of the entire community health program to ensure adequate targeting

- Immunization, supplementation and deworming were above 85% among children in the second year of life when mothers' reports were considered in addition to child health cards. The coverage and presence of child health cards were particularly commendable in districts of Kotido and Napak. The level of immunization and supplementation met national targets and should be sustained

- The most prevalent common childhood illness was malaria (51.8%) followed by ARI (42.0%) and was similar to previous assessments. Prevalence of diarrhea (27.6%) was lower than in May 2013 where it was 36.6%

- Bed net use was 33.4%. Bed net use has deteriorated in many districts except in Amudat where it was 71.7% and Nakapiripirit at 81.6%. Only 5.5% and 6.7% of the children in Moroto and Kaabong, respectively, slept under a bed net the night preceding the assessment

- Over 50% of the households in Kotido, Napak and Moroto were experiencing food insecurity or were at risk (poor or borderline)

- The three districts of Kotido, Napak and Moroto, which had the highest proportion of households with poor and borderline food consumption scores, also reported the least food stocks as of December 2013. The food stocks in the three districts were reported to last less than a month. The situation of food insecurity in the districts of Kotido, Napak and Moroto therefore needs urgent attention from the government and partners

- Whereas over 80% of the households in Karamoja were using bore hole water, latrine coverage was still low. Over 90% of the households in Amudat and Napak, and over 80% of the households in Moroto and Nakapiripirit, were using open bush for defecation

- A number of factors were associated with malnutrition on bivariate analysis. For instance, underweight mothers were more likely to have children with GAM and with underweight compared to the mothers of normal weight; anemic children were more likely to be stunted and underweight compared to those who were not anemic; not having used a bed net was associated with increased risk of GAM, stunting, and underweight compared to those who reported to have slept under bed net the night of the survey; history of suffering from malaria malaria in the two week prior assessment was associated with high prevalence of GAM, stunting and underweight; history of diarrhea was associated with increased prevalence of GAM and underweight; mothers' education was positively associated with stunting and underweight status of children; and poor household food security was associated with increased risk of stunting but not with GAM and underweight. However, on multivariate analysis only child sex was independently associated with malnutrition. This could suggest that factors other than those included in the current survey could as well be iinfluencing the status of malnutrition outcome in the region

- We recommend early interventions in 2014 to prevent the impending food insecurity especially in the districts of Kotido, Napak and Moroto

BACKGROUND

1.1 Introduction

It is routine practice to conduct surveillance Food Security and Nutrition Assessments (FSNA) in Karamoja region by the Ministry of Health with support from partners especially the UN agencies. This time round, UNICEF contracted the School of Public Health, Makerere University College of Health Sciences, (Mak-SPH) to conduct the FSNA in the region. Field data collection was conducted during the first three weeks of December 2013 in all seven districts of Karamoja namely: Abim, Amudat, Kaabong, Kotido, Moroto, Nakapiripirit and Napak. This was the second survey in 2013 with the first one carried out in the months of May. The aim of these regular surveys is to generate information to monitor and improve programme and policy interventions.

Information on health, nutrition and food security was collected at household level. This report provides a detailed description of the methodology and sampling procedures, data collection process, variables assessed and how the data was analyzed; and the findings of the assessment. Conclusions and recommendations are based on findings as per objective.

1.2   Objectives

1.2.1 Broad objective

The broad objective of the assessment was to obtain data on indicators of health, nutrition and food security status in Karamoja region in order to monitor and/or improve programming and policy interventions.

1.2.2 Specific objectives for the assessment

Nutrition objectives
- Assess the prevalence of malnutrition among children aged 6-59 months;
- Estimate the coverage of vitamin A supplementation and deworming in past six months among children 6-59 months of age;
- Estimate prevalence of malnutrition using BMI among women aged 15-49 years
- Assess feeding practices among children 0-23 months of age;
- Estimate the individual dietary diversity (IDDS) among children 6-23 months
- Determine the prevalence of anemia among children and women 15-49 years

- Assess the prevalence of common diseases (diarrhoea, fever, and ARI) among children 6 – 59 months, two weeks prior to the assessment
- Assess the coverage of routine immunizations coverage (DPT and measles)
- Estimate the proportion of households with access to improved water sources and sanitation

Food security objectives

- Assess the crop cultivation patterns at household level
- Estimate the proportion of households at short term risks of food insecurity;

1.3 Conceptual framework for the causes of malnutrition

The survey was based on the conceptual framework of the causes of malnutrition adapted from the 1990 UNICEF model, which suggests that fundamental influences to nutrition and food security outcomes remain within the environment (Figure 2). Information was collected on factors at most of the framework levels with the exception of the total potential resources.

Food and Nutrition Security Conceptual Framework
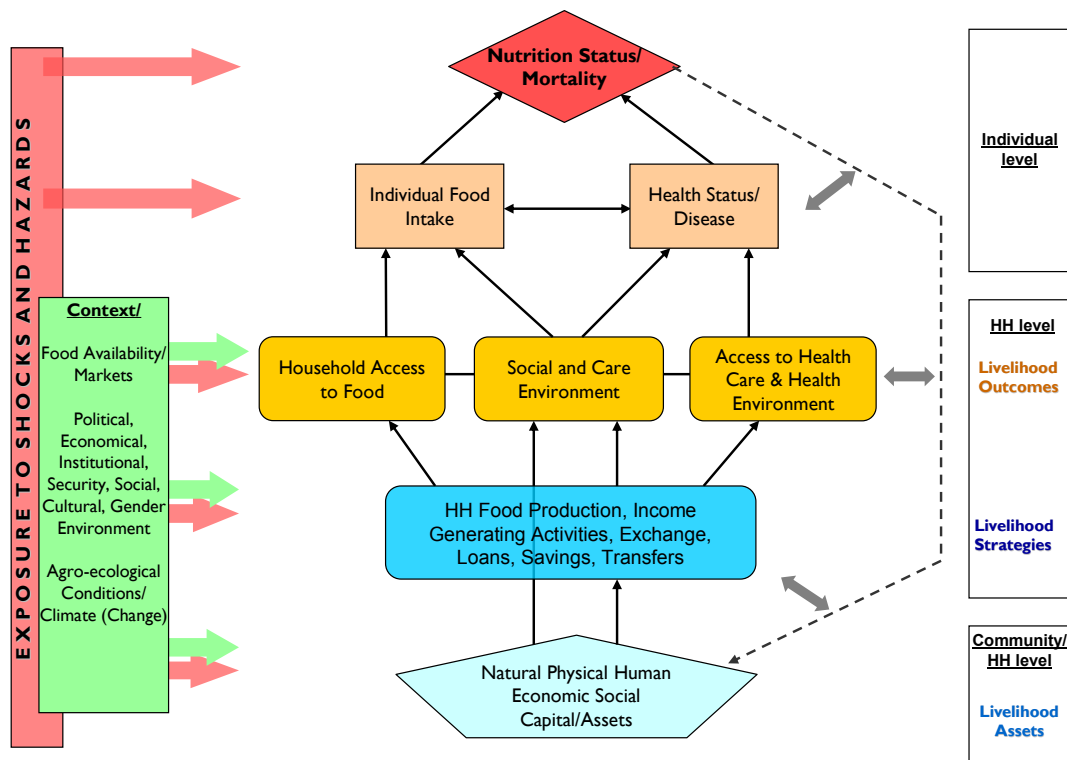
Figure 1.1: Conceptual framework to analyze food security and nutrition in society (adapted from UNICEF 1990)

METHODOLOGY

This was a population based and cross-sectional targeting districts of Abim, Amudat, Kaabong, Kotido, Moroto and Nakapiripirit.

2.1 Target population

The targets were representative households in each of the seven districts regardless of who occupies them. Children between the ages of 0 and 59 months and their mothers if they existed in the sampled households were assessed. Where children and/or mothers never existed in a household the head of household was interviewed to collect information only on food security. Age of children was confirmed by use of child health cards. Children with physical disabilities were assessed but findings on anthropometry were excluded.

2.2 Sample size and sampling procedure

The target was to detect a minimum variation of 5% of Global Acute Malnutrition (GAM) with 85% precision. We aimed to sample a total of 420 representative households using a two-stage 30x14 cluster randomization design. At the first stage a probability sample of 30 clusters was selected using an updated list of villages that constitute a district (with their corresponding populations). The updated lists were obtained from the District Population Offices. At the second stage households were systematically sampled. Systematic sampling was done by ensuring a random start and using a calculated sampling interval using a list of village households obtained from the village head. A total of 2940 households were therefore targeted for sampling in all the seven districts combined.

2.3 Variable measurements and data collection instruments

Data was collected on the following variables: age; sex; weight; height; bilateral pedal oedema; morbidity for common diseases and conditions; infant feeding practices; ownership of household assets, livestock and land; income sources and expenditures; food consumption diversity; hunger and food security; education status

of mother and household head; water and sanitation; immunization/supplementation and deworming; and livelihood coping mechanisms.

2.3.1 Age and sex
Exact age of the child was reported in months using information on child health cards. Where these did not exist, age (month and year of birth) was determined using a local calendar of events. An age chart (Appendix 4) was used to read off age in months if date of birth (month and year) was known. Sex was assessed based on mother's reports and/or observation as appropriate.

2.3.2 Weight
Any child falling within the age bracket of 0 to 59 months found in the household sampled was weighed. The weight was recorded to the nearest 0.1kg accuracy on the conventional scales. Even those with oedema were weighed and the Emergency Nutrition Assessment (ENA) for SMART software was used for data analysis and accounted for such.

2.3.3 Height
Children above the age of two years were measured standing upright whilst those below 2 years were measured lying down to nearest 0.1cm. Where age was difficult to determine, those measuring less than 85cm were generally measured lying down and those taller than 85cm measured standing upright. **_Note_**: _Only data of children measuring between 65cm and 110cm were used for analysis where age was not known._

2.3.4 Bilateral oedema
Oedema was assessed by exerting medium thumb pressure on the upper side of each foot for three seconds. Oedema was recorded as present if a skin depression remained on both feet after pressure was released.

2.3.5 BMI and MUAC
Mothers/caregivers 15-49 years of age were assessed for weight and height to calculate their Body Mass Index (BMI). Children 6-59 months and mothers were also assessed for Mid-Upper Arm Circumference (MUAC) using tapes to nearing 0.1 cm.

2.3.6 Morbidity and care seeking
Morbidity from common childhood illness like acute respiratory infections (ARI), fever and diarrhea were assessed over a two-week recall period. In addition, coverage of the essential primary care services such as immunization, vitamin supplementation

and deworming among infants and young children, and environmental and domestic sanitation factors such as latrine and safe water coverage were assessed. WHO definitions for diseases and conditions were used.

2.3.7 Infant feeding practices

Breastfeeding and complementary feeding practices were assessed for each child. Assessment covered exclusive breast-feeding rates (using 24-hour recall), quality and quantity of complementary feeding and active feeding practices. Individual dietary diversity scores (IDDS) were assessed to establish adequacy of complementary feeding among children 6-23 months.

2.3.8 Household hunger and food security

Standard and valid questions from UNICEF/UNWFP and Feed The Future (FTF) indicators were used to assess household hunger and food security. Data was collected on household agricultural food production for common crops such as maize, millet, sorghum, potato, cassava and banana. The types of food and the number of times they are eaten in the past 7 days, any foods bought by the household and the income sources will be assessed. In addition hunger/ starvation was assessed using standard questions[1]. Household socioeconomic status was assessed by collecting information on household assets (bicycle, radio, hoe/axe, mobile phone, motorcycle/car, shoes, clothes, television, etc); animals (cow, goat, sheep, chicken, and pig); and education status of mothers and/or household head.

2.3.9 Water and sanitation

Household source of water, faecal, garbage and other domestic hygiene practices such as ownership of garbage pit, utensil racks were assessed.

2.3.10 Immunization/Supplementation and de-worming

Vitamin A supplementation and de-worming in the last 6 months, and DPT3 and Measles vaccination coverage was ascertained from Child health cards and/or mothers recall.

2.3.11 Assessment of anemia status

Blood samples were collected through a finger prick from children and mothers/caregivers to determine the hemoglobin level. Hemocue analyzer machines 301 were used and assessments were done by qualified/trained health workers.

---

1 FANTA. Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide. 2007

2.4 Data collection

Data was collected using a single questionnaire (Appendix 6), administered face-to-face to mothers and/or household heads in their home settings. The data collection tool was in English but a translated tool was used to administer the questionnaire. Data was collected simultaneously in all the seven districts by trained research assistants. Field data collection lasted a total of 10 days in each district while training of research assistants last for 3 days. For successful data collection in Uganda, the use of local and civic leaders is imperative. In this regard, local officials were identified and used as guides to identify households for interviews and to support anthropometric measurements. Data was collected in the first three weeks of December 2013.

2.5 Quality assurance procedures during data collection

To ensure that good and accurate information was collected by research assistants, the following quality assurance measures were put in place:

- Research assistants were required to edit research tools or data at the point of data collection. This enabled effective correction and verification of data collected;
- The supervisors edited questionnaires and ensured that they are correct and complete while in the field;
- A record of daily activities showing the number of tools completed, by whom and the location where they were undertaken was kept; and
- Daily debriefing of the research team was ensured at the end of every day's activities.

2.6 Data Management

Data were entered in Epidata 3.1 software by clerks based at the School of Public Health. Entered data was copied, saved and exported to ENA software for generation of z-scores and eventual analysis of the nutrition data. Data was backed-up daily including saving it on distant servers through the email system. Other data were analysed in SPSS Version 21.

2.7 Data analysis and interpretation of findings

Data were analyzed by the Principal Investigator assisted by the co-Investigators. Findings were interpreted based on national indicators and/or according to plan in some aspects especially for gender variables. District specific and pooled data were concurrently presented. As much as possible data were disaggregated by sex and age. Current findings were compared to previous surveys to establish any positive or negative changes.

2.7.1 Analysis of anthropometric data

Anthropometric indices were presented based on the WHO standard. Indices were expressed in Z-scores.

Global acute malnutrition (GAM)

Was estimated using Weight-for-Height index and oedema. Children presenting with a weight for height index less than –2 z scores with/without oedema were considered to have GAM.

Moderate Acute Malnutrition (MAM) and Severe Acute Malnutrition (SAM):

These were estimated using Weight-for-Height index. Children presenting less than –2 z-scores but greater than –3 z-scores were regarded as moderately malnourished while those with less than –3 z-scores and/or presence of bilateral oedema were regarded as severely malnourished. Likewise, underweight (weight-for-age) and stunting (height-for-age) were analysed.

MUAC and BMI

Were interpreted based on WHO criteria.

2.7.2 Anemia

Was interpreted based on the WHO classification.

2.7.3 Analysis of morbidity and other health and sanitation data

Prevalence of diseases and conditions occurring two weeks prior the survey, latrine and coverage of health indicators were reported using descriptive statistics.

2.7.4 Analysis of food security data

Food security data was systematically analyzed. First, a household wealth index was generated from ownership of household property using principal components analysis. The wealth index was derived from the first principal component, which was then ranked and categorized into quintiles. Second, household food consumption

scores were generated based on 8 food groups derived from the 16 food columns in the questionnaire using the UNWFP/UNICEF – weighted scores of certain food groups. These pre-assigned weights for starch, meat, pulses, sugar, oil and milk are 2, 4, 3, 0.5, 0.5 and 4, respectively, were used. Third, other facet of food security such as food sources, expenditures on food and coping mechanisms were accordingly analysed.

2.8 Ethical considerations

Permission to collect data was sought from local authorities with the DHO's involvement. The purpose of the survey was clearly explained. Protocol was observed while entering any community. A written consent was sought from survey participant before any interview and confidentiality ensured.

FINDINGS

3.1 Socio-demographic factors

3.1.1 Education

The majority of the mothers aged 15-45 years in Karamoja have zero years of formal education (Figure 1). The importance of education for both the girl and boy child cannot be overemphasized. Education and keeping of the girl child in School is fundamental factor for socioeconomic development and improvement of indicators in Karamoja region. All possible means including the building of more boarding Schools, providing food in Schools, and directly linking Karamojong children with donor families elsewhere should be explored by relevant authorities in order to improve the education status of children in the region.
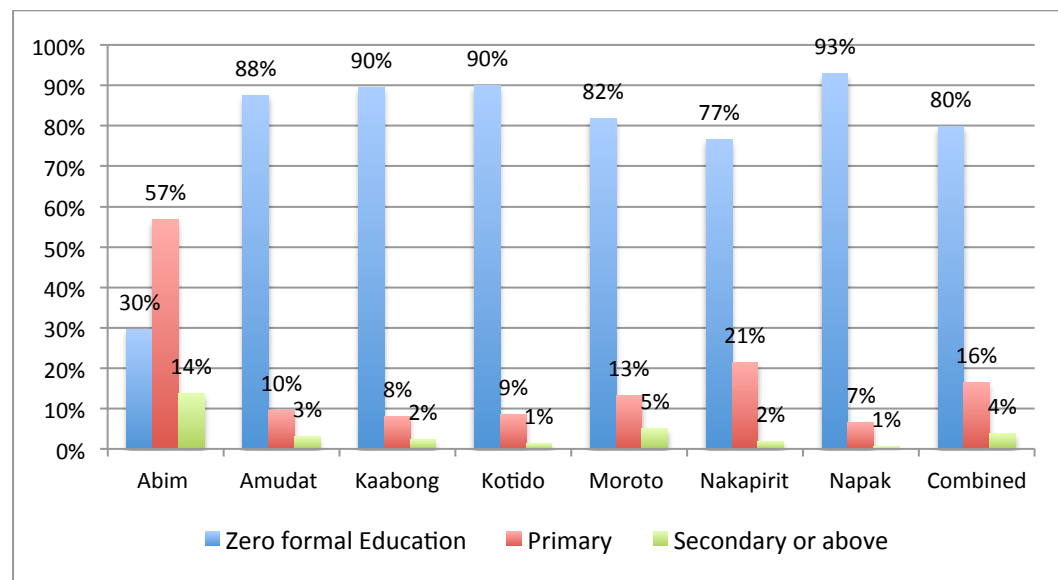
Figure 1: Education status of women aged 15-45 years according to district

3.1.2 Reproductive health

The mean (SD) household size for Karamoja was 5.6 (2.2) persons and the median was 5.0 persons. There was no significant variation between districts. However, the majority of the women 15-45 years in Karamoja were either pregnant or breastfeeding (Figure 2) and had given birth to four or more children (Figure 3) Since our sampling was based on household regardless of presence of children, these

findings are representative of the entire region. The situation of high fertility in the region calls for partners to intensify reproductive health services.

	Abim	Amudat	Kaabong	Kotido	Moroto	Nakapirit	Napak	Combined
Pregnant	14.9%	18.1%	9.2%	8.8%	9.3%	15.9%	12.1%	12.3%
Breastfeeding	57.3%	64.2%	72.1%	73.5%	74.5%	65.7%	65.0%	68.1%
Preg & B/feeding	0.8%	0.3%	2.1%	0.9%	0.8%	1.0%	3.9%	1.4%
Not preg & not b/feeding	26.7%	17.4%	16.6%	16.8%	15.4%	17.5%	19.0%	18.2%

■ Pregnant　■ Breastfeeding　■ Preg & B/feeding　■ Not preg & not b/feeding
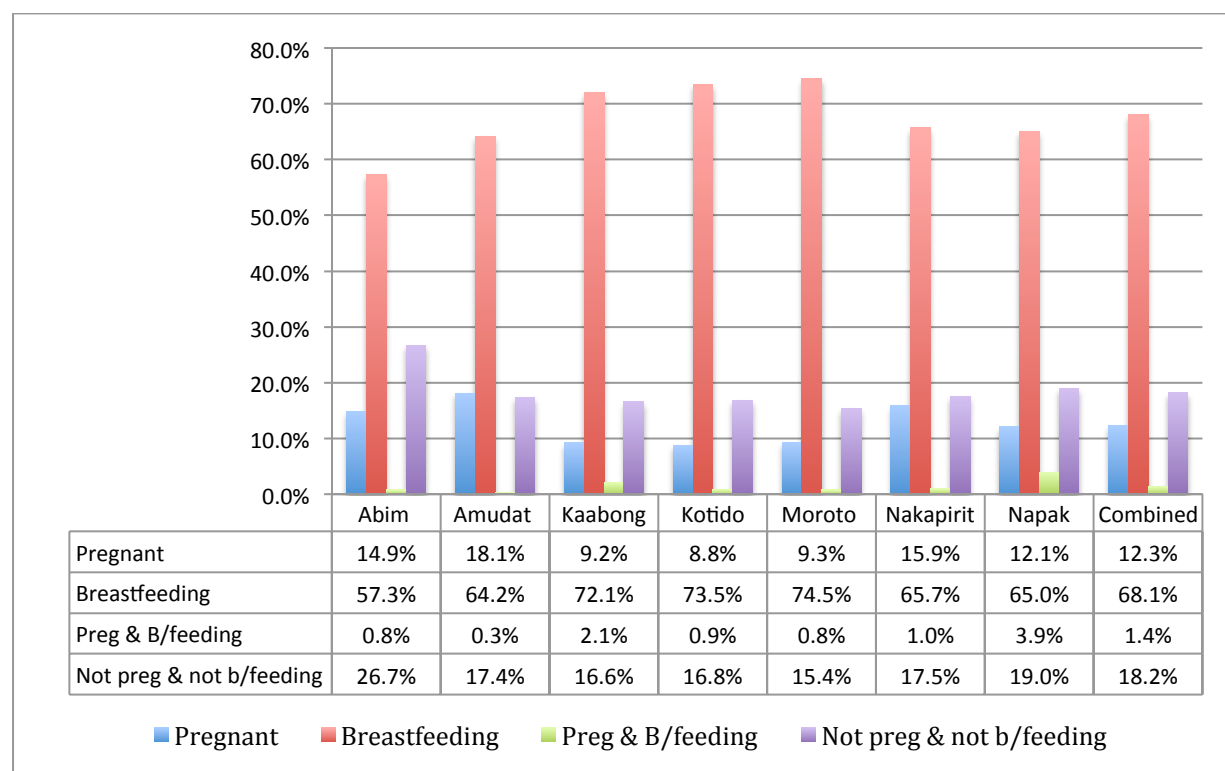
Figure 2: Reproductive health status among women 15-45 years according to district (N=2296)

	Abim	Amudat	Kaabong	Kotido	Moroto	Nakapirit	Napak	Combined
One or less	13.7%	24.0%	14.1%	15.0%	20.4%	21.2%	13.5%	17.3%
Two	19.0%	16.7%	16.6%	19.7%	19.3%	19.9%	10.8%	17.4%
Three	8.7%	17.3%	18.9%	17.2%	18.5%	13.8%	17.1%	16.3%
Four or more	58.6%	42.0%	50.4%	48.1%	41.7%	45.2%	58.7%	49.0%

■ One or less　■ Two　■ Three　■ Four or more
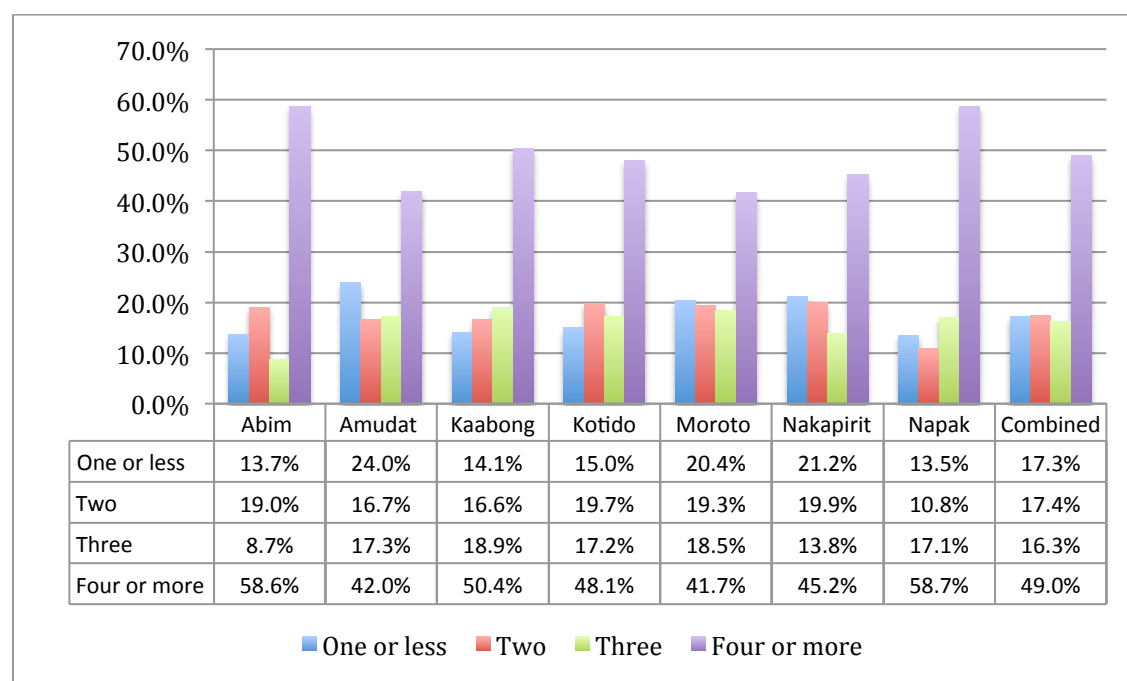
Figure 3: Number of children (fertility) status among women 15-45 years according to district (N=2334)

3.2 Nutrition status of children and women 15-45 years

3.2.1 Prevalence of wasting, stunting and underweight

The overall prevalence of GAM among children 6-59 months in Karamoja region was 11.0%, 95% CI (9.9 – 12.3) (Table 1). This was in similar range with the May 2013 survey where GAM was 12.5%, 95% CI (11 – 14).

Table 1: Prevalence of GAM, SAM, Stunting and Underweight according to district, December 2013 (No exclusion)

District (6-59 months)	GAM	SAM	Stunting	Underweight
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Abim (N=311)	5.5 (3.5- 8.7)	1.0 (0.3 - 2.8)	34.6 (29.5 - 40.1)	18.9 (14.9 - 23.6)
Amudat (N=308)	9.2 (6.4 - 12.9)	4.9 (2.2 - 6.7)	30.5 (25.3 - 36.4)	23.0 (18.4 - 28.5)
Kaabong (N=291)	14.2 (11.2 - 17.9)	3.4 (2.0 - 5.6)	40.6 (36.0 - 45.5)	34.8 (30.3 - 39.6)
Kotido (N=400)	10.5 (7.8 - 13.9)	3.8 (2.3 - 6.2)	39.0 (34.3 - 43.9)	25.9 (21.8 - 30.5)
Moroto (N=453)	16.0 (12.9 - 19.6)	4.1 (2.6 - 6.3)	43.6 (39.0 - 48.2)	34.2 (30.1 - 38.8)
Nakapiripirit (N=348)	10.3 (7.5 - 13.9)	2.1 (1.0 - 4.2)	30.2 (25.5 - 35.3)	25.5 (21.2 - 30.4)
Napak (N=405)	8.2 (5.8 – 11.3)	2.8 (1.6 – 5.0)	37.9 (33.2 – 42.8)	24.5 (20.5 – 29.0)
Combined (N=2561)	11.0 (9.9 – 12.3)	3.5 (2.9 – 4.3)	37.6 (35.8 – 39.5)	27.5 (25.8 – 29.2)

Based on WHO classification of the prevalence of malnutrition, that is:

Wasting: acceptable (0-5%) / poor (5%-10%) / serious (10%-15%) / critical (greater than 15%);

Stunting: acceptable (less than 20%) / poor (20%-30%) / serious (30%-40%) / critical (greater than 40%);

Underweight: acceptable (less than 10%) / poor (10%-20%) / serious (20%-30%) / critical (greater than 30%),

Compared to findings of May 2013 and using point prevalence (Table 2):

- Abim improved on underweight from serious to poor status
- Amudat improved on GAM from critical to poor
- Kaabong worsened on underweight from serious to critical
- Kotido had no change
- Moroto deteriorated on both GAM and stunting from serious to critical on both parameters
- Nakapiripirit improved on both stunting and underweight from critical to serious on both parameters

- Overall there was no improvement for Karamoja between May and December 2013

Table 2: A diagrammatic view of malnutrition expressed according to the WHO classification of prevalence of malnutrition, by district

District	Wasting	Stunting	Underweight
Abim	Poor	Serious	Poor
Amudat	Poor	Serious	Serious
Kaabong	Serious	Serious	Critical
Kotido	Serious	Serious	Serious
Moroto	Critical	Critical	Critical
Nakapiripirit	Serious	Serious	Serious
Napak	Poor	Serious	Serious
Combined	Serious	Serious	Serious

3.2.2 Distribution of malnutrition by age

The peak age for GAM was 6-17 months while that for SAM was 54-59 months (Figure 4). The findings are consistent with what is observed in previous assessments in the region. There is need to continuously address challenges of complementary feeding as seen under section of infant feeding practices in this report.
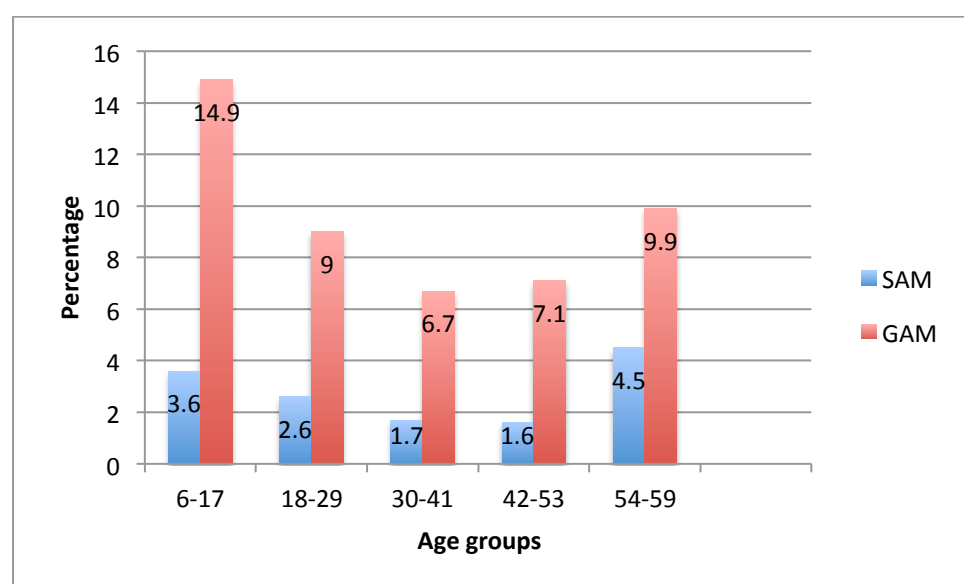
Figure 4: Distribution of GAM and SAM according to age group

The peak age for underweight, severe underweight and stunting was however, 18-29 months (Figure 5 & Figure 6).
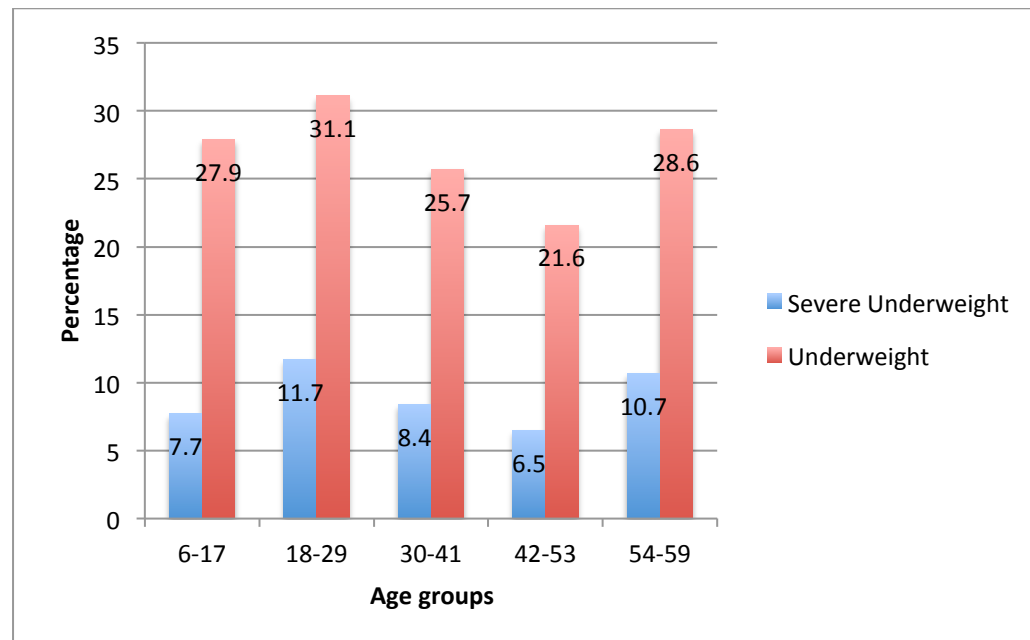
Figure 5: Distribution of Underweight according to age of children
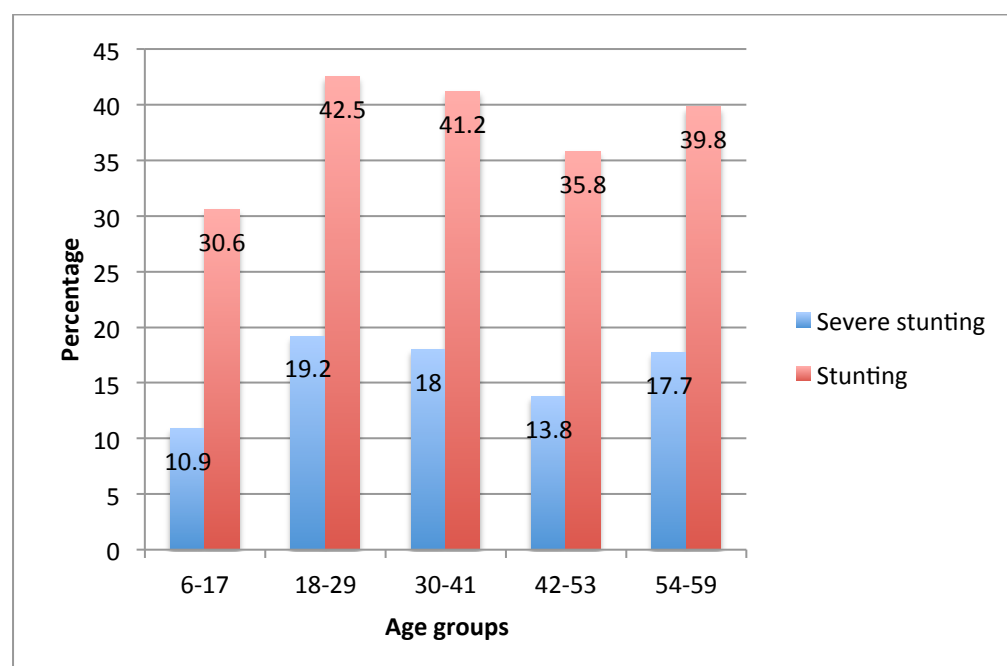
Figure 6: Distribution of stunting according to age of children

3.2.3 Distribution of malnutrition by sex

GAM an SAM

There was a statistically significant relationship between GAM and sex with more boys 13.2% 95% CI (11.4–15.2) affected than girls 8.9% 95% CI (7.5 – 10.5). However, the sex differences between SAM were not statistically significant (Figure 7).
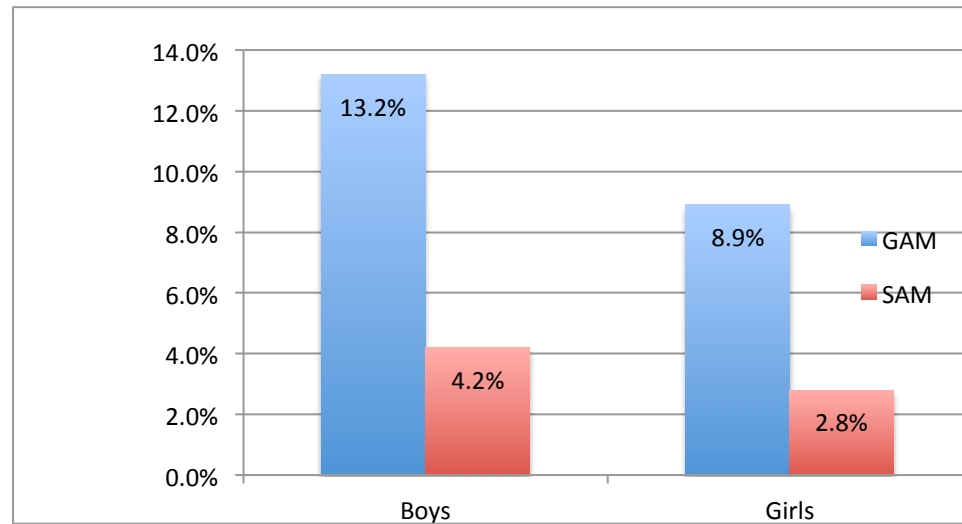
Figure 7: Distribution of GAM and SAM by Sex among children 6-59 months

Stunting

There were statistically significant differences in both stunting and severe stunting between boys and girls with the former more affected than the latter (Figure 8). Stunting in boys 40.3%, 95% CI (37.6 - 43.0) Vs 34.6%, 95% CI (32.1 - 37.2) and severe stunting in boys 18.3% (16.2 - 20.5) Vs girls 12.9% (11.2 - 14.8).
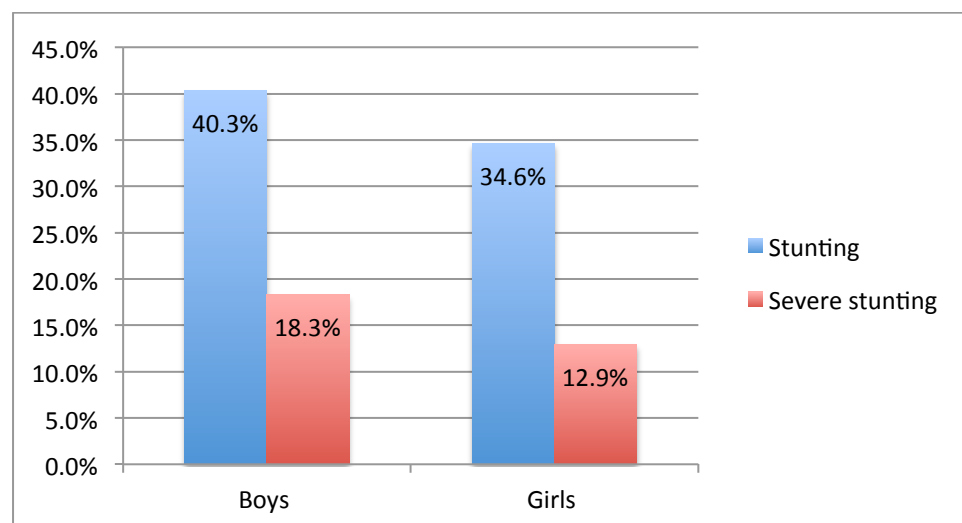
Figure 8: Distribution of stunting and severe stunting by sex among children 6-59 months

Underweight

Boys were significantly more likely to be underweight 30.7% (28.2 - 33.3) than girls 24.5% (22.2 - 26.8) (Figure 9), however the sex differences were not statistically significant with severe underweight.
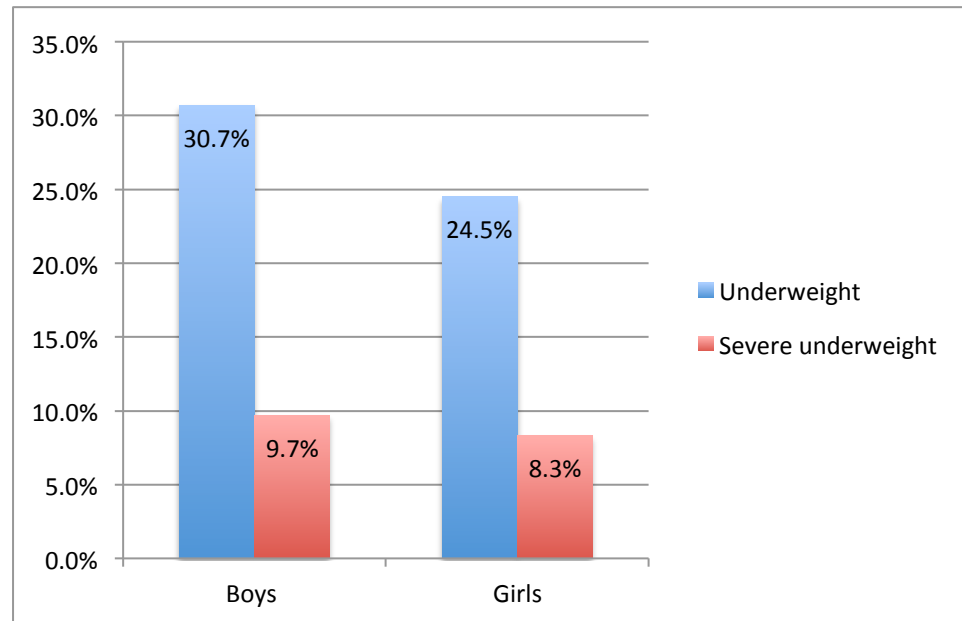
Figure 9: Underweight and severe underweight status by sex in children 6-59 months

3.2.4 Prevalence of anemia in children and mothers

Anemia was highly prevalent in Karamoja with over 60% of the children 6-59 months anemic in all districts (Table 4).

Table 3: Prevalence of anemia in children 6-59 months according to district

District	Severely Anemia	Moderately Anemia	Mildly Anemic	Not Anemic
	%	%	%	%
Abim (N=247)	2.4	39.3	23.5	34.8
Amudat (N=242)	4.1	35.1	21.9	38.8
Kaabong (N=315)	3.5	33.7	21.9	41.0
Kotido (N=360)	1.9	31.9	28.6	37.5
Moroto (N=340)	3.5	33.2	26.2	37.1
Nakapirit (N=327)	4.0	41.3	23.5	31.2
Napak (N=430)	3.0	38.6	25.3	33.0
Combined (N=2261)	3.2	36.1	24.7	36.0

Likewise more than 40% of the women 15 -49 years in all districts were anemic (Table 5).

Table 4: Prevalence of anemia in women 15 – 45 years according to district

District	Severely Anemic	Moderately Anemic	Mildly Anemic	Not Anemic
	%	%	%	%
Abim (N=193)	0.5	3.1	35.8	60.6
Amudat (N=246)	1.2	14.2	30.1	54.5
Kaabong (N=295)	0.7	7.1	29.2	63.1
Kotido (N=310)	0.0	4.8	34.2	61.0
Moroto (N=245)	0.4	6.9	33.5	59.2
Nakapirit (N=267)	0.0	8.6	37.1	54.3
Napak (N=320)	0.0	9.4	45.3	45.3
Combined (N=1876)	0.4	7.8	35.2	56.6

3.2.5 Prevalence of underweight among women 15 – 49 years

Mothers' nutrition status assessed by BMI was poor. The proportion of underweight mothers in Karamoja has remained constantly high. Prevalence of underweight mothers was 22.5% in May 2013 and was 23.1% in current survey (Table 6). The prevalence of underweight mothers was associated with GAM in children in bivariate analysis (results presented in another section below), but was not associated with anemia status in women. Anemic in mothers should be addressed since anemic mothers are more likely to have children with GAM.

Table 6: BMI of mothers 15-45 years of age according to district

District	Severely underweight	Moderately underweight	Normal	Overweight	Obese
	%	%	%	%	%
Abim (N=225)	2.2	14.7	81.8	0.9	0.4
Amudat (263)	1.9	17.1	74.9	4.9	1.1
Kaabong (360)	3.1	23.1	73.3	0.6	0.0
Kotido (316)	1.3	9.8	85.4	3.2	0.3
Moroto (324)	4.6	22.5	70.1	2.8	0.0
Nakapirit (270)	4.1	26.7	68.5	0.7	0.0
Napak (276)	4.7	25.0	70.3	0.0	0.0
Combined (2034)	**3.1**	**20.0**	**74.8**	**1.9**	**0.2**

3.3 Infant and young child feeding practices

3.3.1 Breastfeeding and complementary feeding practices

Exclusive breastfeeding rates among infants less than 6 months was above 90% in most districts except Amudat and Kotido (Figure 10)
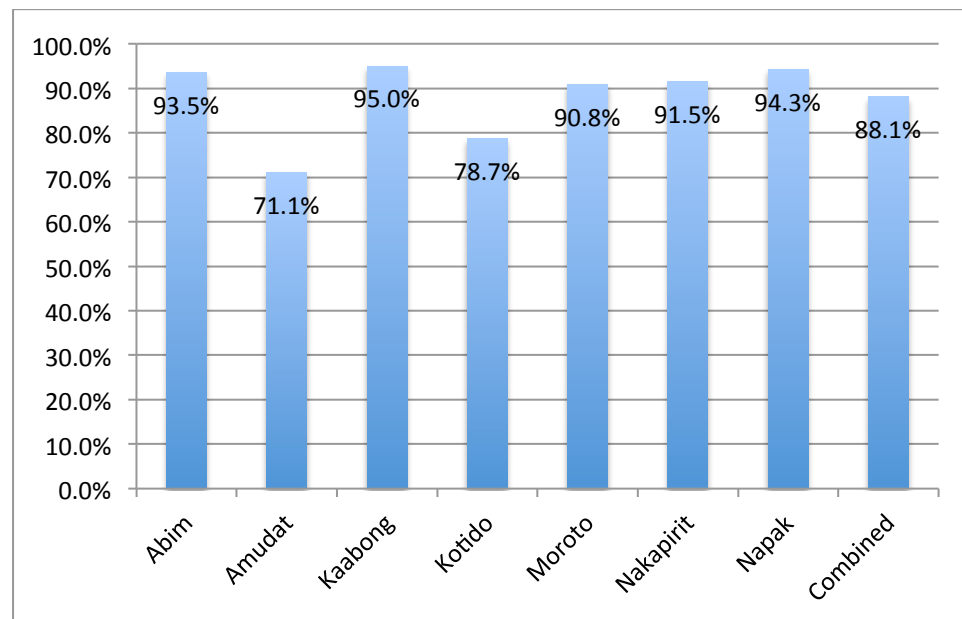
Figure 10: Exclusive breastfeeding rates among children 0-5 months according to districts (N=394)

3.3.2 Diversity of complementary foods eaten by children 6-23 months

Using 24-hour recall, individual dietary diversity score (IDDS) was assessed based on seven food groups. The assessment was done only in children 6-23 months. Minimum dietary diversity has been defined as the proportion of children who received foods from at least 4 food groups the previous day2. The IDDS in the current assessment was worse than what has been previously observed in all Karamoja districts (Figure 11). A history of belonging to the low IDDS was associated with a 19-fold increase in risk of GAM compared to those in the high IDDS category.

---

2 Low $\leq$ 3; medium > 3 but $\leq$ 5; high >5
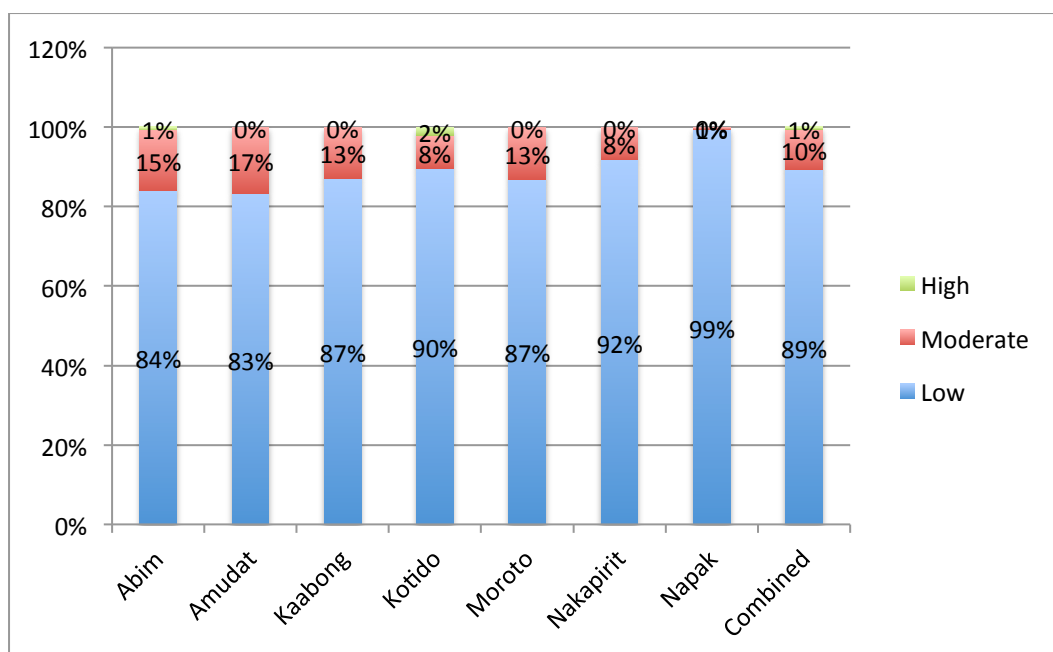
Figure 11: Individual dietary diversity score for children 6-23 months

With the exception of Amudat (91.9%) and Nakapiripirit (59.8%) consumption of milk by children 6-23 months was rare in other districts (Table 7).

Table 7: Proportion of foods reported eaten by children 6-23 months in the 24-hour recall according to district

District	Cereals	Oils	Meats	Milk	Eggs	Legumes	Fruits	Vegetables	Sugar
	%	%	%	%	%	%	%	%	%
Abim	93.1	42.0	11.5	1.5	19.1	45.8	6.9	42.7	11.5
Amudat	92.9	46.5	19.4	91.9	10.3	7.0	3.6	68.0	73.9
Kaabong	90.6	84.7	2.8	47.7	11.7	34.0	0.0	63.4	5.0
Kotido	89.1	88.0	7.3	32.8	24.5	13.0	2.6	44.3	2.1
Moroto	92.1	83.1	0.8	27.0	9.8	39.1	2.4	76.1	5.5
Nakapirit	87.9	83.1	4.8	59.8	19.4	17.1	3.2	77.9	9.4
Napak	88.5	94.2	3.2	21.7	1.9	7.6	0.6	44.6	1.3
Combined	**90.5**	**76.8**	**6.1**	**39.4**	**14.0**	**24.7**	**2.4**	**58.6**	**13.3**

3.3.3. Participation in feeding programs

Although a fair proportion (17.3%) of children 6-59 months that were sampled had been enrolled in feeding programs (Table 8) at the time of the assessment, a larger proportion of children with GAM (67.6%) and underweight (73.5%) were not participating in any feeding program (Table 9). This may indicate a very weak screening program for malnutrition in Karamoja. Weak screening could be due to

delayed intervals of community level screening or lack of sensitivity of the MUAC screening method. Alternatively it could be possible that the supplementary/therapeutic feeding programs are not adequately targeting the right children. Problems of equity commonly occur with targeted programs where the most marginalized fail to access the program while those who may not necessarily need the service access them easily.[3] This calls for a careful evaluation of the entire community health program to ensure adequate targeting.

Table 5: Proportion of children 6-59 months enrolled in any feeding program according to districts

	OTC	ITC	CSB+++	None
District	N (%)	N (%)	N (%)	N (%)
Abim	9 (3.0)	0	21 (6.9)	273 (90.1)
Amudat	10 (3.3)	0	59 (19.3)	236 (77.4)
Kaabong	19 (4.9)	2 (0.5)	16 (4.1)	354 (90.5)
Kotido	17 (4.2)	2 (0.5)	102 (25.3)	282 (70.0)
Moroto	20 (4.2)	5 (1.1)	48 (10.9)	369 (83.5)
Nakapirit	18 (5.3)	2 (0.6)	45 (13.4)	272 (80.7)
Napak	0	0	53 (13.5)	346 (86.7)
Combined	93 (3.6)	11 (0.4)	344 (13.3)	2132 (82.6)

Table 6: Proportion of malnourished children not yet recruited in any feeding program

Indicator	OTC	ITC	CSB+++	None
	N (%)	N (%)	N (%)	N (%)
GAM	31 (10.9)	4 (1.4)	57 (20.1)	192 (67.6)
Underweight	54 (7.4)	6 (0.8	133 (18.3)	535 (73.5)
Stunted	58 (5.8)	7 (0.7)	158 (15.9)	773 (77.6)

When the entire admissions for the feeding programs for the year 2013 were considered, Amudat and Abim districts recorded the lowest number while Kaabong recorded the largest number of clients (Figure 12). In total, one out of three children in Karamoja were admitted into a feeding program in 2013. This large proportion could be verified by findings of this assessment since 17.3% of the children reported to have been on a feeding program at the time of the survey.

---

[3] Victora CG, Wagstaff A, Schellenberg JA, Gwatkin D, Cleason M, Habicht J-P. Applying an equity lens to child health and mortality: more of the same is not enough. The Lancet 2003; 362:233-241.
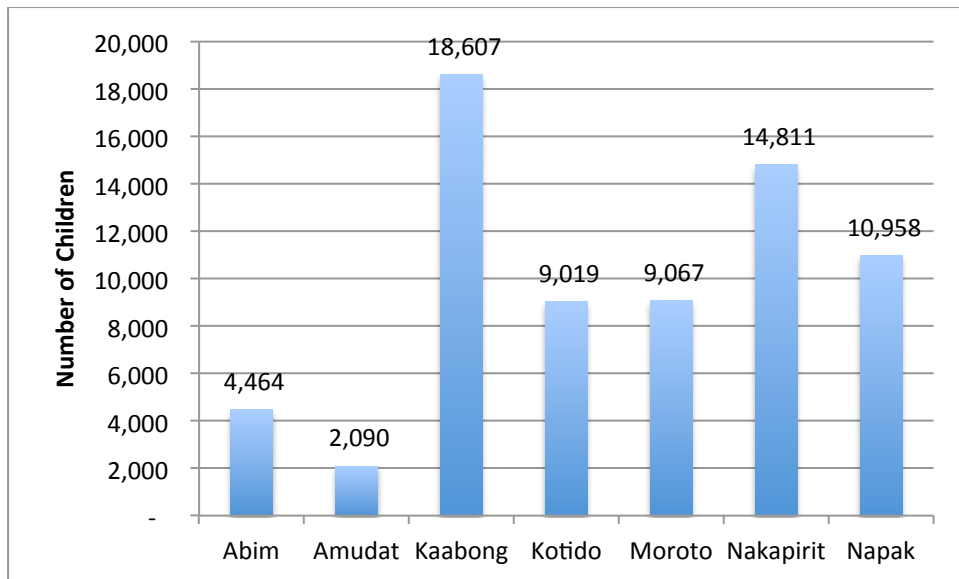
Figure 12: Total annual admissions into feeding programs (SFP/TFP) for 2013 according to district

In monthly trends, April, May, June and July had the highest admission rates into feeding programs (Figure 13).
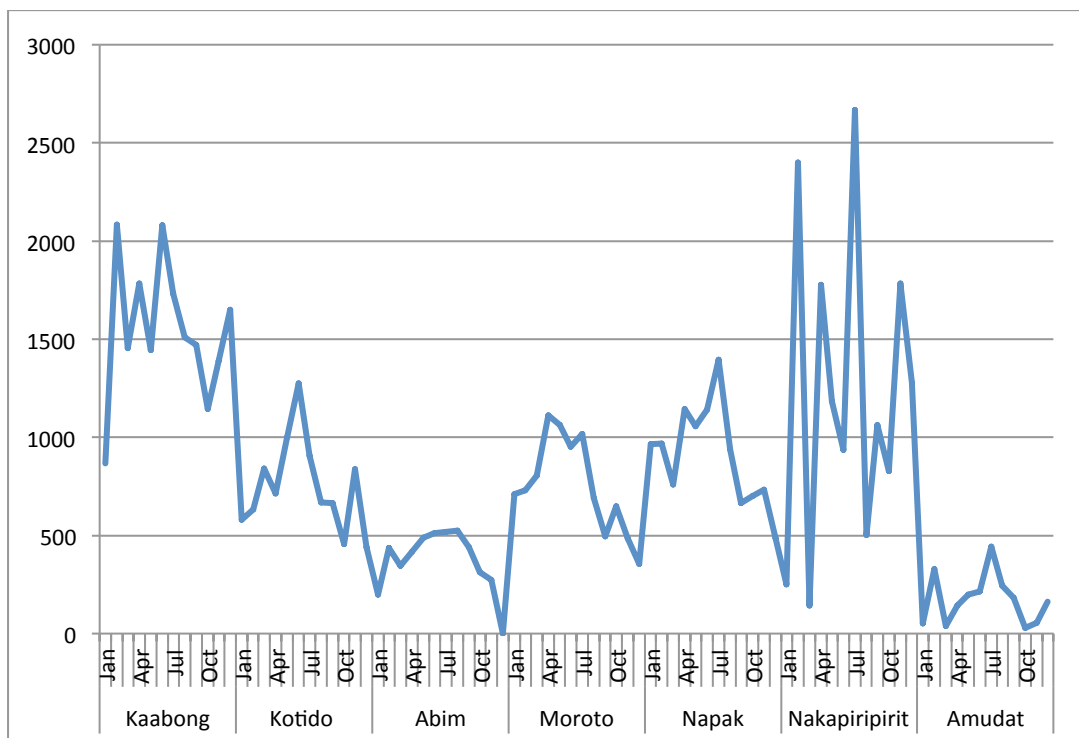

Figure 13: Monthly admissions into feeding programs for 2013 according to district

3.4 Immunization, vitamin A supplementation and deworming coverage

Immunization, supplementation and deworming were above 85% among children in the second year of life when mothers' reports were considered (Tables 10-13). The coverage and presence of child health cards were particularly commendable in the districts of Kotido and Napak. The level of immunization and supplementation meets the national targets and should be sustained.

Table 7: Measles immunization coverage among children 12-23 months according to district

District	Yes with card	Yes without card	No with card	No without card
	%	%	%	%
Abim (N=85)	61.2	22.4	14.1	2.4
Amudat (N=99)	60.6	22.2	10.1	7.1
Kaabong (N=156)	57.1	32.7	6.4	3.8
Kotido (N=126)	93.7	4.8	1.6	0.0
Moroto (N=124)	66.9	32.3	0.0	0.8
Nakapirit (N=96)	64.6	26.0	5.2	4.2
Napak (N=101)	80.2	15.8	3.0	1.0
Combined (N=787)	69.3	22.7	5.3	2.7

Table 8: DPT3 immunization coverage among children 12-23 months according to district

District	Yes with card	Yes without card	No with card	No without card
	%	%	%	%
Abim (N=85)	68.2	27.1	3.5	1.2
Amudat (N=100)	64.0	28.0	6.0	2.0
Kaabong (N=158)	57.0	40.5	2.5	0.0
Kotido (N=126)	95.2	3.2	1.6	0.0
Moroto (N=124)	66.1	33.1	0.8	0.0
Nakapirit (N=96)	69.8	29.2	1.0	0.0
Napak (N=101)	81.2	17.8	1.0	0.0
Combined (N=790)	71.3	26.1	2.3	0.4

Table 9: Deworming coverage in children 12-59 months according to district

District	Yes with card	Yes without card	No with card	No without card
	%	%	%	%
Abim (N=257)	64.6	33.1	1.6	0.8
Amudat (N=251)	53.4	40.6	4.4	1.6
Kaabong (N=334)	50.0	46.1	1.8	2.1
Kotido (N=342)	90.6	7.0	2.3	0.0
Moroto (N=381)	53.5	43.3	2.4	0.8
Nakapirit (N=282)	45.0	46.5	6.7	1.8
Napak (N=343)	60.1	39.4	0.6	0.0
Combined (N=2190)	60.0	36.3	2.7	1.0

Table 10: Vitamin A supplementation coverage among children 6-59 months

District	Yes with card	Yes without card	No with card	No without card
	%	%	%	%
Abim (N=307)	67.1	30.0	2.3	0.7
Amudat (N=301)	52.8	37.2	8.0	2.0
Kaabong (N=410)	54.6	41.7	2.7	1.0
Kotido (N=407)	91.6	5.7	2.5	0.2
Moroto (N=443)	56.2	41.3	2.3	0.2
Nakapirit (N=340)	48.8	44.1	6.5	0.6
Napak (N=395)	63.8	34.9	1.3	0.0
Combined (N=2603)	62.6	33.4	3.4	0.6

3.5 Prevalence of common childhood illnesses and bed net use

The most prevalent common childhood illness was malaria (51.8%) followed by ARI (42.0%) and was similar to previous assessments. Prevalence of diarrhea was lower than in May 2013 where it was 36.6% (Table 14).

Table 11: Two-week prevalence of common childhood illness according to district

District	Malaria	ARI	Diarrhoea	Skin diseases	Eye disease	Measles	Other illness	No Illness
	%	%	%	%	%	%	%	%
Abim	45.5	39.2	16.0	2.7	4.4	0.4	0.0	12.0
Amudat	41.9	41.3	16.2	5.3	14.9	0.4	2.1	21.1
Kaabong	64.9	65.5	43.1	8.0	12.5	0.9	1.6	4.9
Kotido	56.9	40.9	39.0	10.4	17.4	1.4	3.5	17.2
Moroto	49.7	37.2	19.8	2.1	4.6	0.2	6.4	25.0
Nakapirit	51.5	46.5	35.3	3.6	11.6	0.8	1.4	9.2
Napak	49.8	22.8	21.8	5.7	4.8	1.0	2.3	23.4
Combined	51.8	42.0	27.6	5.4	10.0	0.7	2.6	16.2

Unfortunately bed net use has deteriorated in many districts except in Amudat and Nakapiripirit. For instance only 5.5% and 6.7% of the children in Moroto and Kaabong, respectively, slept under a bed net the night preceding the assessment (Figure 14).
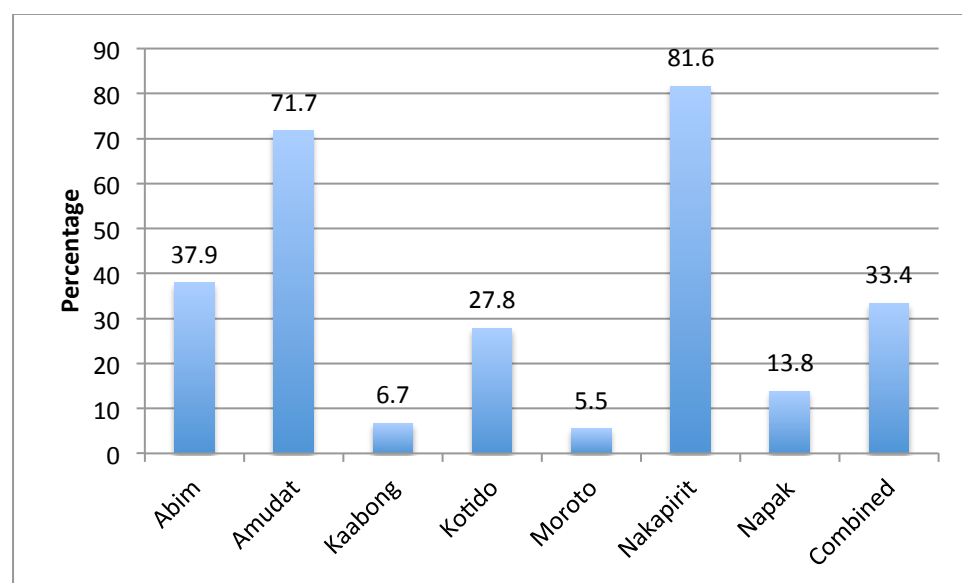

Figure 14: Proportion of children who slept under a bed net during the night preceding the survey according to district

3.6 Household food security and livelihood status

3.6.1 Food consumption scores

Food insecurity was assessed using a recall of the number of days for which specific food groups were consumed in the past seven days. The Food Consumption Scores (FCS) that we used were equal to the number of days certain food groups was eaten in last 7 days x weight of the particular food group. The weights were: Cereals and tubers (2); pulses (3); vegetables (1); fruits (1); meat, fish, eggs (4); milk and milk products (4); oil (0.5); and sugar (0.5). The total FCS was obtained by summing up FCS obtained for each food group and was then categorised.

Almost over 50% of the households in Kotido, Napak and Moroto were experiencing food insecurity or were at risk (poor or borderline) (Figure 15). Descriptively, food insecurity findings in the current assessment were worse than those observed in May 2013 in all districts except Abim, Amudat and Kaabong.
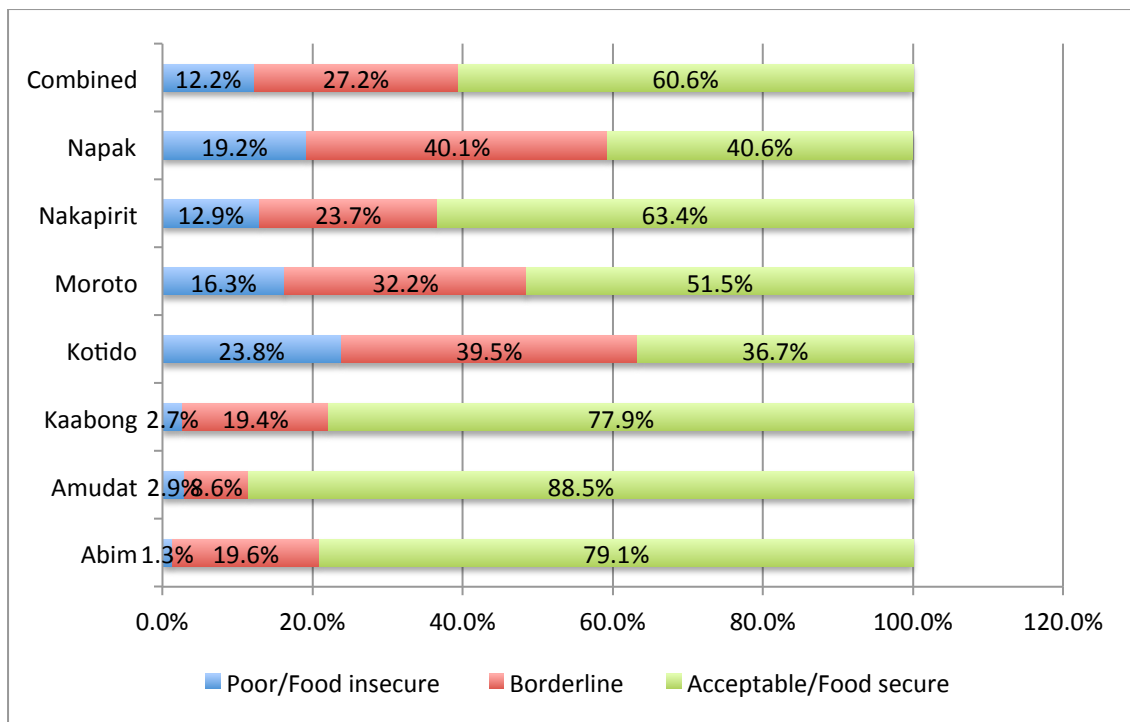
Figure 15: Food consumption scores according to district

Most of the food items eaten were purchased (Figure 16). Purchase of foodstuff was most prevalent in Moroto and Napak districts.
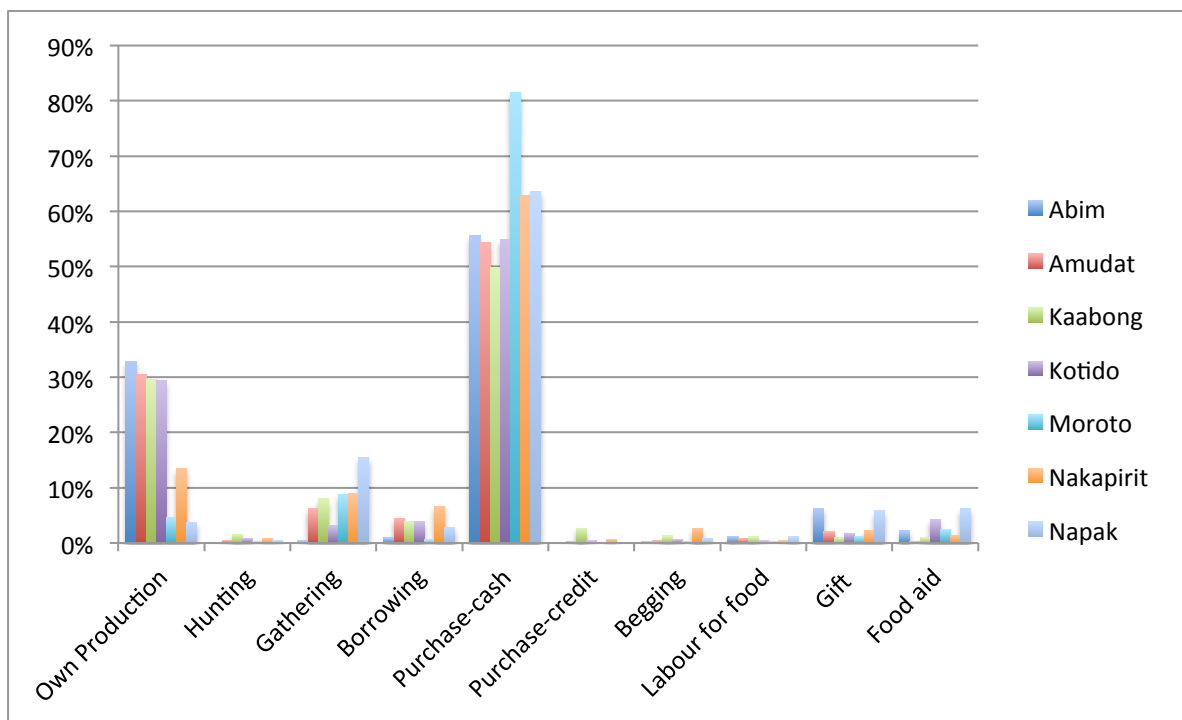

Figure 16: Sources of food consumed by households in past seven days according to district

3.6.2 Situation of food stocks in households

Unfortunately the three districts of Kotido, Napak and Moroto, which had the highest prevalence of poor food consumption scores, also reported the least food stocks in their household (Table 15). The food stocks in the three districts were reported to last less than a months posing a threat to food security situation. The situation of food insecurity in the districts of Kotido, Napak and Moroto needs urgent attention from the government and partners.

Table 12: Current food stocks at household level and expected duration to depletion

District (N)		Current food stock (Kg)	Estimated duration (Months)
Abim (N=312)	Mean	218	3
	SD	271	2
	Median	120	3
Amudat (N=300)	Mean	115	2
	SD	142	4
	Median	73	2
Kaabong (N=448)	Mean	97	3
	SD	88	5
	Median	88	2
Kotido (N=330)	Mean	41	1
	SD	84	1
	Median	10	1
Moroto (N=364)	Mean	5	0
	SD	19	1
	Median	0	0
Nakapirit (N=343)	Mean	75	2
	SD	126	3
	Median	30	1
Napak (N=263)	Mean	8	0
	SD	24	1
	Median	0	0
Combined (N=2358)	Mean	80	2
	SD	146	3
	Median	20	1

3.6.3 Household food production

Most of the households in Kaabong district (90%) cultivated some crops (Figure 17). There were three main reasons provided by household that did not cultivate any crops. That is, poor weather (42.6%), sickness or physical inability (27.3%) and having no access to land (16.7%). Other reasons included insufficient household labour (4.5%) and lack of seed and tools (3.9%).
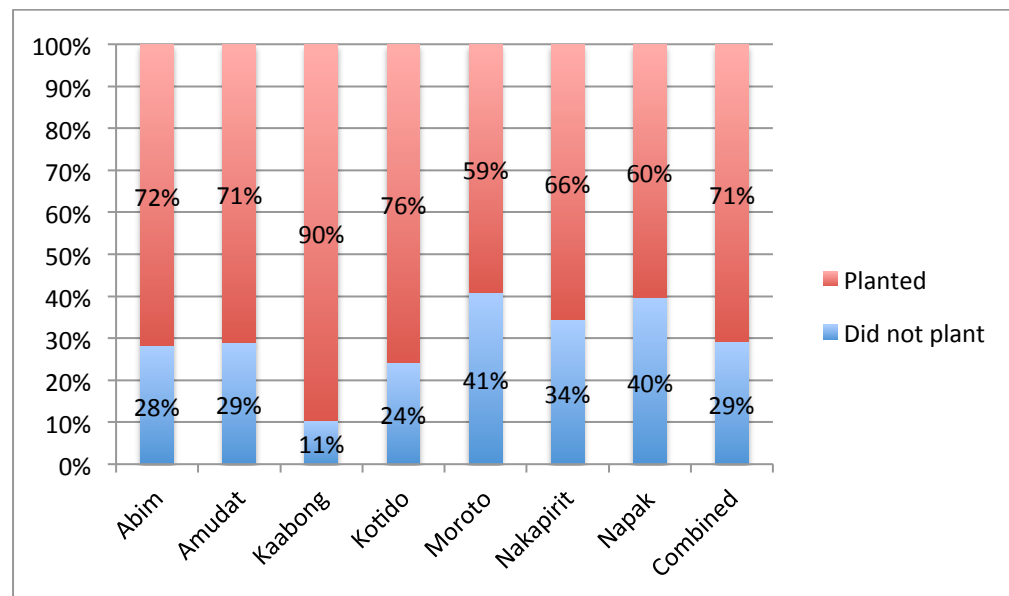

Figure 17: Proportion of household that cultivated any crops in 2013

However, harvests for 2013 were described by most households as having been lower than those of 2012 (Figure 18).
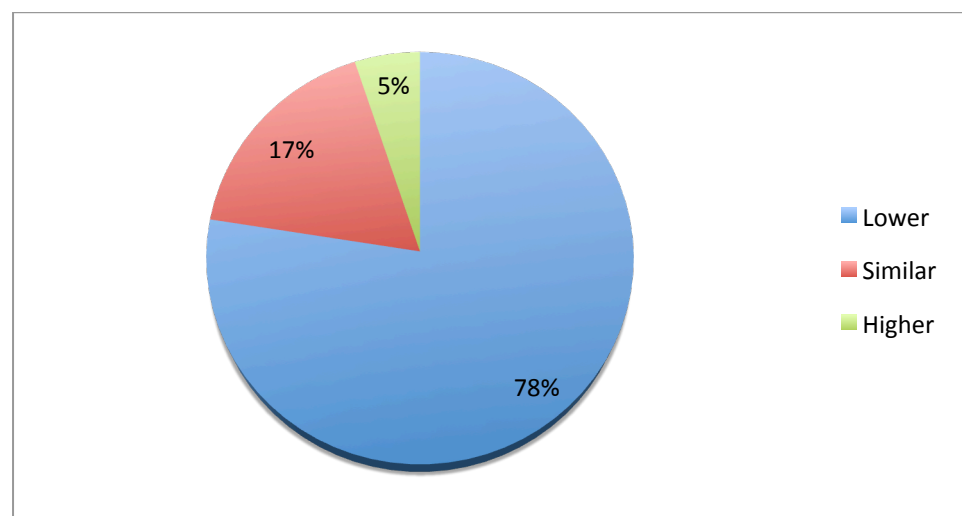

Figure 18: Comparative analysis of 2013 harvest with that of 2012

Quantitatively, harvests were low especially in Napak, Moroto and Kotido (Table 16).

Table 13: Average harvests in 2013 according to type of crop and districts

District		Maize	Millet	Sorghum	Sweet Potato	Rice	Beans	Cassava
Abim	Mean (Kg)	50	71	534	243		88	418
	SD	80	82	3291	241		185	546
	Median (kg)	20	40	100	150		50	300
Amudat	Mean (Kg)	217	0	20	49	0	16	7
	SD	206	0	67	418	0	31	58
	Median (Kg)	200	0	0	0	0	0	0
Kaabong	Mean (Kg)	118	27	162	9	7	88	6
	SD	181	142	123	34	66	257	28
	Median (Kg)	100	0	100	0	0	12	0
Kotido	Mean (kg)	49	37	94	0	0	10	0
	SD	129	86	122	7	2	34	0
	Median (Kg)	0	0	50	0	0	0	0
Moroto	Mean (Kg)	14	1	13	0	0	0	0
	SD	78	9	37	0	0	2	0
	Median (Kg)	0	0	0	0	0	0	0
Nakapirit	Mean (Kg)	62	0	204	16	3	11	11
	SD	160	4	744	94	25	28	79
	Median (Kg)	0	0	80	0	0	0	0
Napak	Mean (Kg)	3	0	64	0	0	2	0
	SD	11	3	165	0	1	9	5
	Median (Kg)	0	0	45	0	0	0	0
Combined	Mean (Kg)	80	17	157	32	1	29	14
	SD	161	74	1174	150	27	130	116
	Median (Kg)	3	0	50	0	0	0	0

3.7 Coping strategies

Coping strategies refer to ways households devise to survive as far as feeding is concerned. Coping strategies may include relying on less preferred or less expensive foods, borrowing, reducing portion sizes, missing meals, and others. The assessed

coping strategies were weighted (using the WFP weights) and a coping strategy index (CSI) was generated. The index was categorized into four categories: 1 = no coping, 2=low coping, 2= medium coping, and 3=highest coping strategies. Abim and Amudat had the highest households that were not involved in any coping strategies (Figure 19).
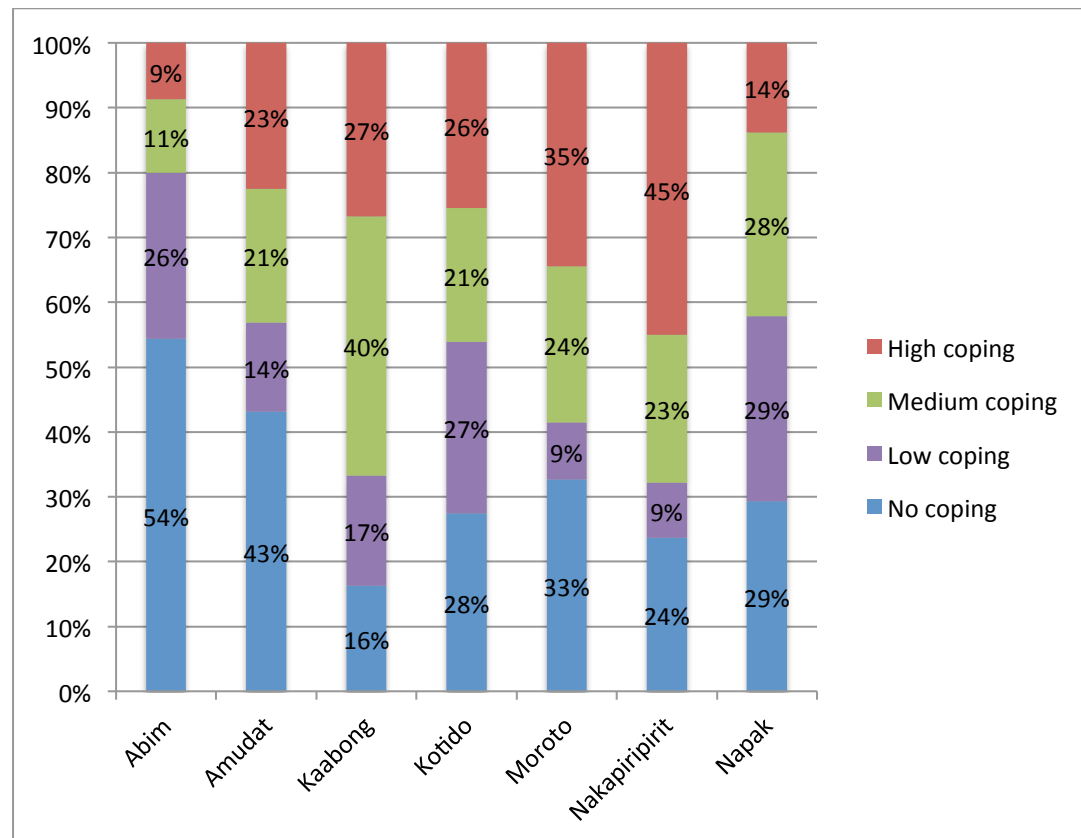

Figure 19: Coping strategy index (CSI-reduced mean) according to district

3.8 Water and Sanitation

3.8.1 Latrine coverage

Latrine coverage is still low in Karamoja region with over 90% of the households in Amudat and Napak; and over 80% of the households in Moroto and Nakapiripirit using the open bush (Figure 20).
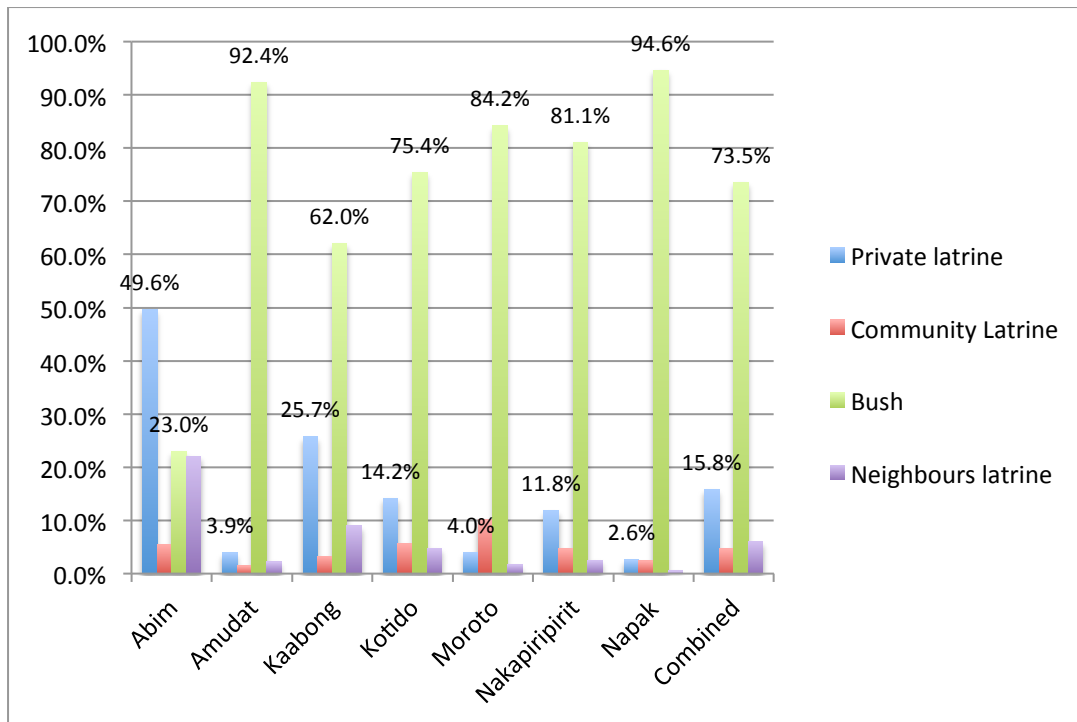
Figure 20: Latrine coverage according to district

3.8.2 Safe water coverage

Over 80% of the households in Karamoja were using bore hole water (Figure 21).
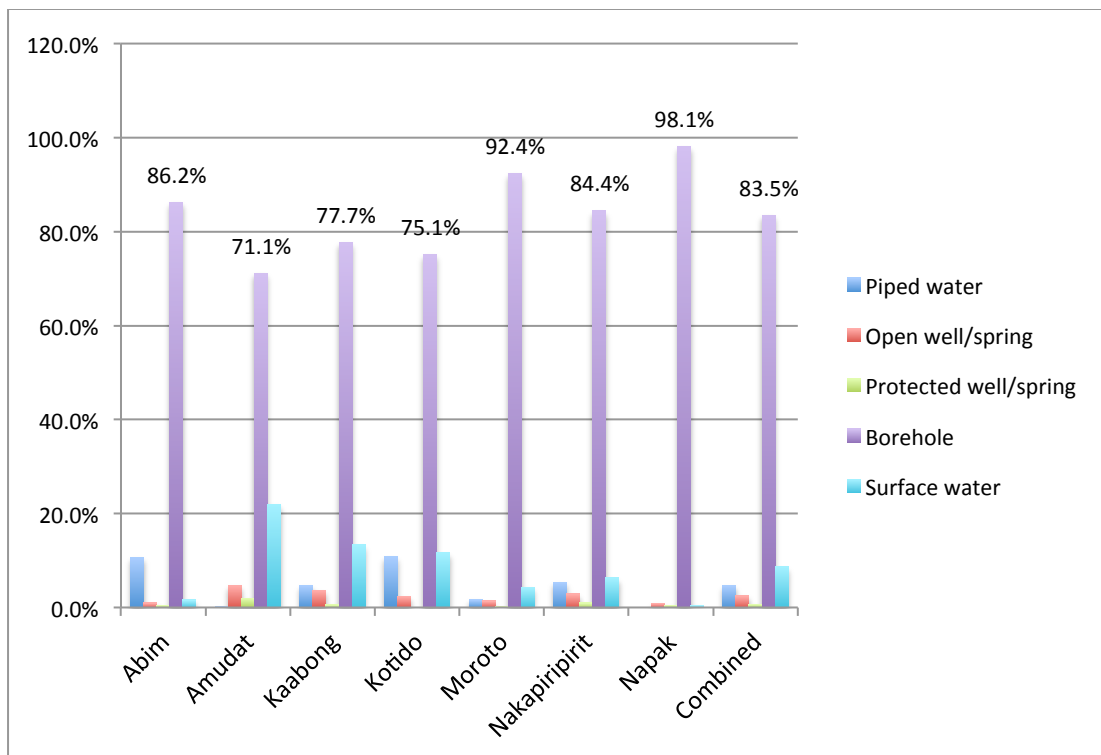

Figure 21: Coverage of safe water sources according to district

3.9 Factors associated with malnutrition

A number of factors were associated with malnutrition on bivariate analysis.

1. Underweight mothers were statistically significantly more likely to have children with GAM (p=0.003) and with underweight (p=0.002) compared to the mothers of normal weight (Figure 22).
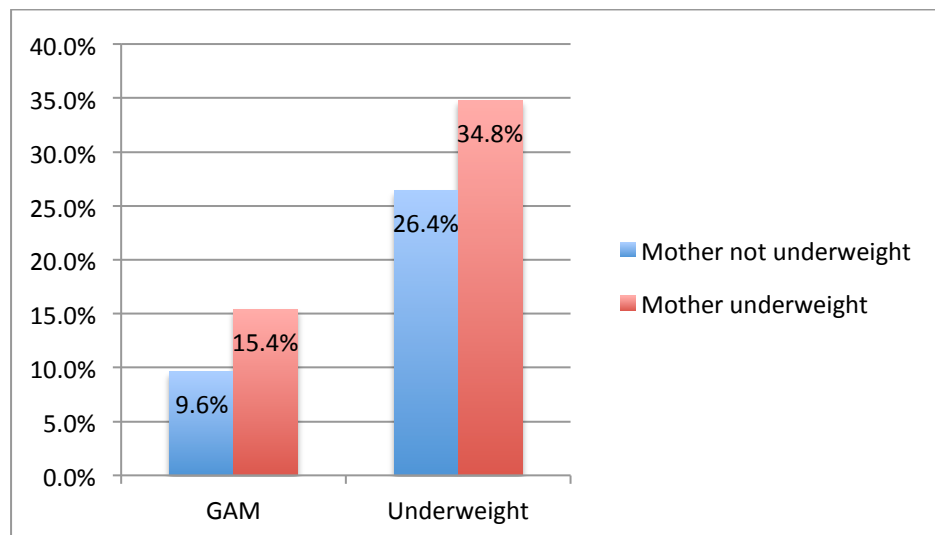

Figure 22: Association between GAM and Underweight with mothers' nutrition status

2. Anemia in children was associated with stunting (p=0.001) and underweight (p= 0.05) (Figure 23)
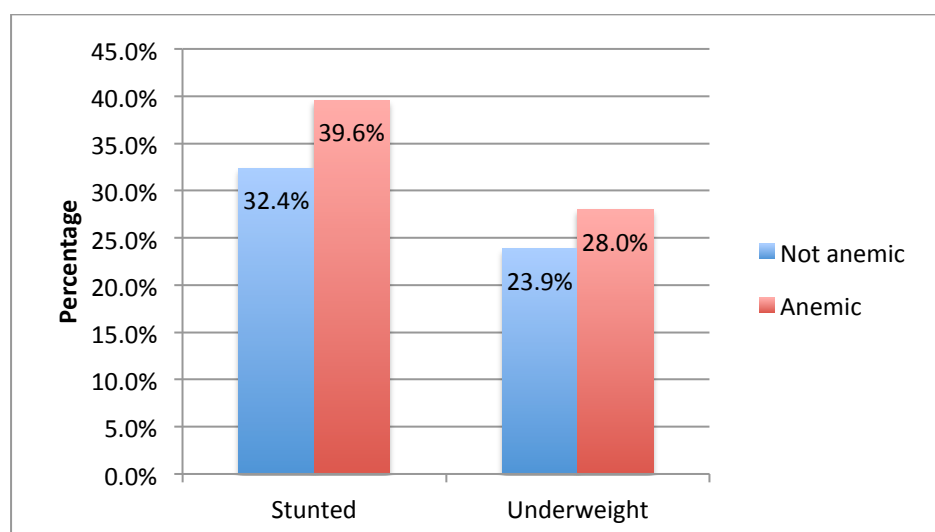

Figure 23: Association of stunting and underweight with anemia status of children

3. History of not having used a bed net was associated with increased risk of GAM (p<0.001), stunting (p<0.001 and underweight (p<0.001) (Figure 24).
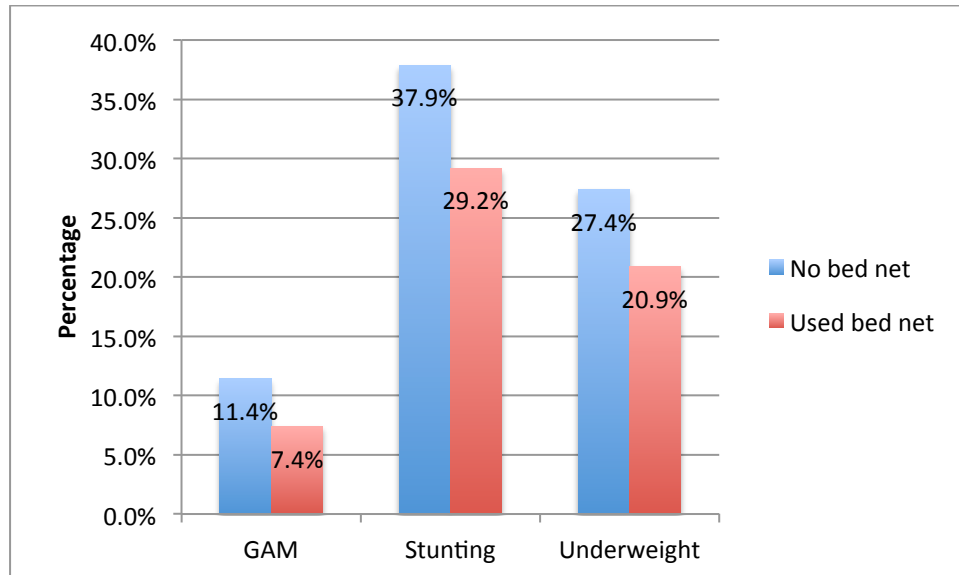

Figure 24: Association of GAM, stunting and underweight with bed net use

4. History of suffering from malaria malaria in the two week prior assessment was associated with high prevalence of GAM (p=0.06), stunting (p=0.05) and underweight (p=0.04) (Figure 25)
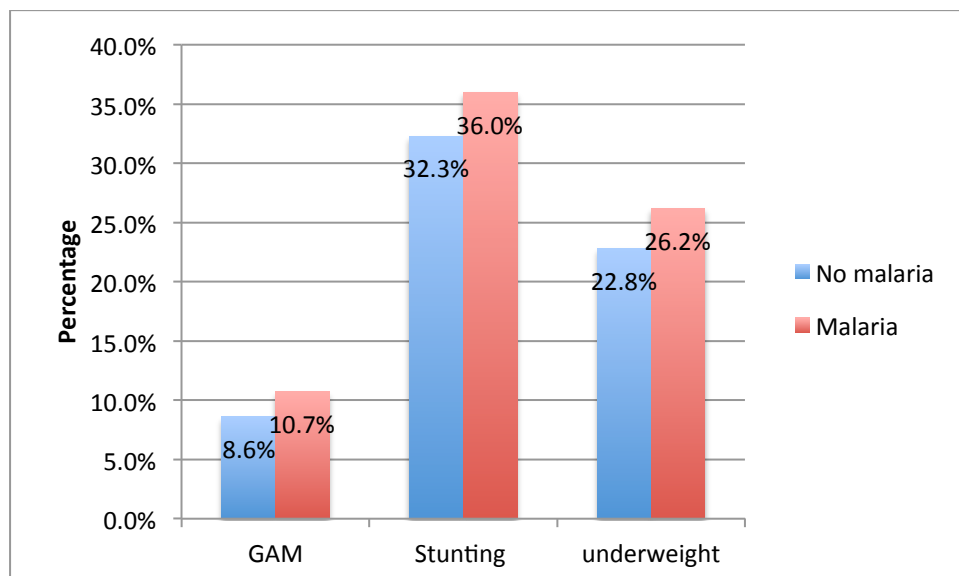

Figure 25: Association of GAM, stunting and underweight with history of malaria

5. History of diarrhea was associated with increased prevalence of GAM (p=0.002) and underweight (p=0.001) (Figure 26)
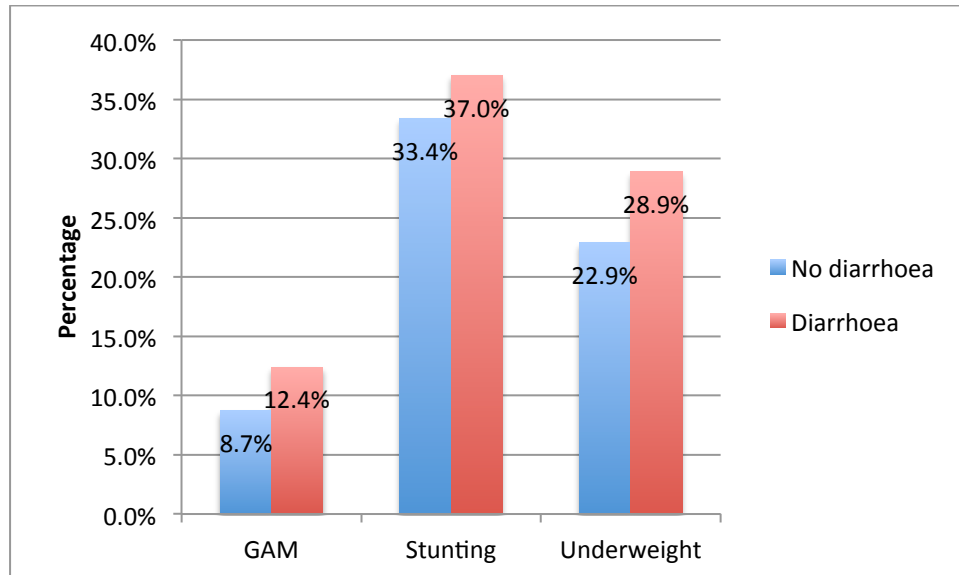

Figure 26: Association between GAM, stunting and underweight with history of diarrhea

6. Mothers' education was associated with stunting and underweight status (Figure 27) and the relationship was statistically significant. Children of more educated mothers were less likely to be malnourished
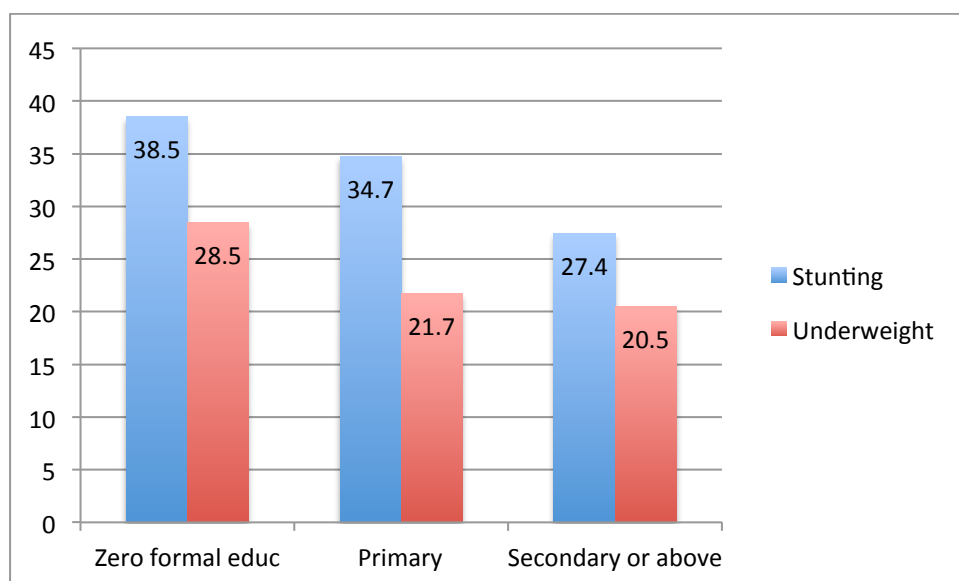

Figure 27: Association of mothers' education with stunting and underweight

7. Level of food security based on food consumption scores was not associated with GAM and underweight. However, there was a clear dose-effect relationship with stunting (Figure 28).
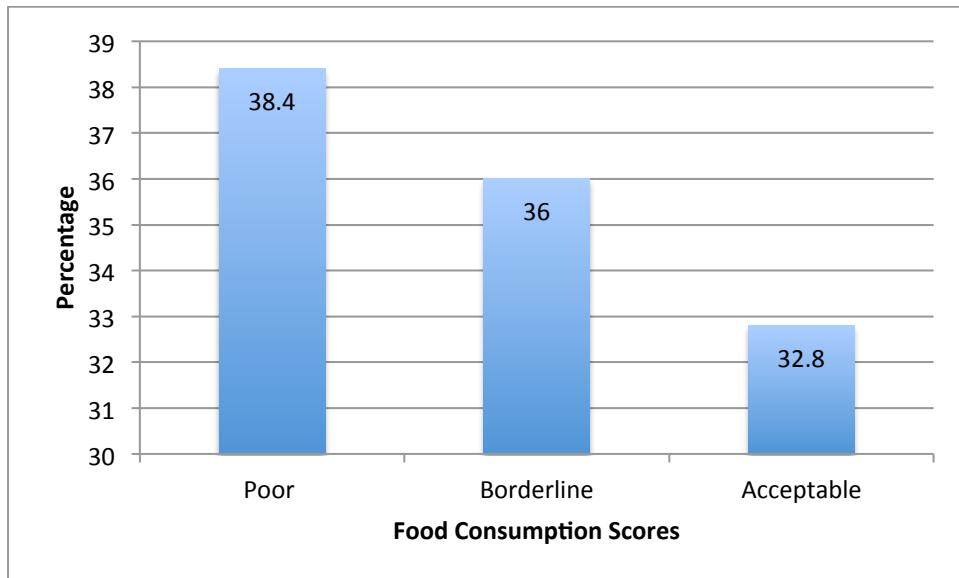

Figure 28: Food consumption scores according to district

CONCLUSIONS AND RECOMMENDATIONS

4.1 Food security

Four out of 10 household were food insecure or at risk of food insecurity in Karamoja. There were dismal food stocks in most of the districts, which are not likely to last up to February 2014. Most of the districts especially Moroto, Napak, Kotido and Nakapiripirit will need special focus to prevent or avert food insecurity, which is likely to intensify in February 2014 unless prior intentions are instituted. Mass food distribution will be the most likely intervention or some form of a voucher arrangement.

4.2 Nutrition

Similar to findings of previous surveys GAM was still serious (above alert level) in Karamoja region. More attention is needed especially for Moroto district where GAM has persistently remained at critical levels.

4.3 Infant and young child feeding

The quality of complementary feeding practices for children 6-23 months was poor with over 90% of the children having had less than four food groups in the 24-hour recall. Whereas almost 20% of the children were reported to be participating in a feeding program (SFP/TFP), a high proportion (67%) of the children with GAM were not participating in such programs. Interventions aimed at improving complementary and therapeutic feeding practices should be emphasised. In addition, supplementary/therapeutic feeding programs at community level should ensure that screening is done at short intervals and that targeting of the right children is emphasised.

4.4 Health access, morbidity and sanitation:

Immunization, vitamin A supplementation and deworming services had achieved the national target and that level of performance should be sustained. However prevalence of common childhood illnesses was high with one out in two children being reported to have suffered from fever two weeks before the assessment. Bed net use was in appalling situation except in Amudat and Nakapiripirit distrcts. There was also no improvement observed with latrine coverage. Strategies should be instituted to promote use and coverage of latrines.

APPENDIX

5.1 Central supervisors

No	Name	Phone	Email
1.	Baguma K Susan	0772663812	krsusieb@yahoo.com
2.	Bagonza Moses	0759129790	bagymog@gmail.com
3.	Katuramu Patrick	0775291307	Katpat@yahoo.co.uk
4.	Kanyike Joseph	075172229	jbkanyike@gmail.com
5.	Bagonza Arthur	0772408080	arthurbagonza@yahoo.com
6.	Rumoma Dickens	0776947183	Rumoma@yahoo.com
7.	Karungi Clara	0776959087	cakarungi@yahoo.com
8.	Kiirya Nicholas	0782853302	
9.	Albert Mugabi	0712962582	albertmunya@yahoo.co.uk
10	Philip Muhire	0792505505	philmuhire87@gmail.com
11	Duncan Ayebare	0772358057	dunc_jn15vs12@yahoo.com
12	David Lubogo	0772362372	dlubogo@musph.ac.ug
13.	Doreen Gonahasa	0752400786	dorynegona@gmail.com
14	Robert Kakira	0701712299	robertkakira@yahoo.co.uk
15.	Wamani Henry	0755443300	wamanih@gmail.com