



INTEGRATED NUTRITION SURVEILLANCE SYSTEM IN KARAMOJA REGION

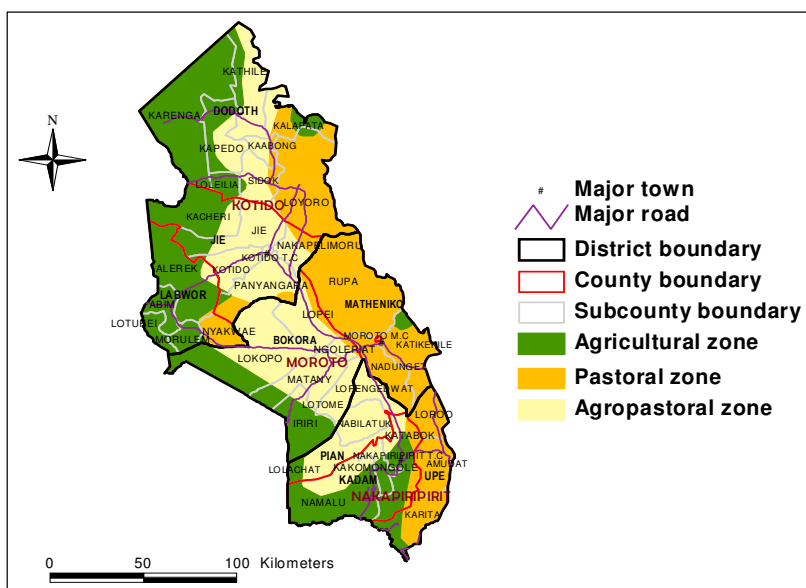
Final report number 003, September 2010

Starting July 2009, Action Against Hunger (ACF) received funding from UNICEF to build the technical capacity of District Health Offices (DHOs) in Karamoja sub region in implementation of small scale community based nutrition surveillance system. The initiative falls within the framework of Ministry of Health (MoH) to improve Nutrition Information Systems in Uganda. The DHOs are supported to collect data, analyze, produce timely reports, disseminate and advocate for response. The system is designed to collect data at three intervals: beginning of the hunger gap (April/May), during the peak of malnutrition (end of August), and after the harvest (December). In this report, we are glad to present the results of the 3rd round and trends of malnutrition in Karamoja.

Summary of key findings

- Global and Severe Acute Malnutrition declined significantly in Moroto district (p value <0.15). GAM declined from 14.7% (9.6%-21.9%) to 8.2% (5.2%-12.7%) while SAM declined from 3.5% (1.9%-6.4%) to 1.4% (0.9%-5.7%).
- The overall Global Acute Malnutrition rate based on livelihood zone was 9.5% (7.7%-11.4%). The decline between May and September was significant (p value <0.15). GAM declined from 11.8% (9.6%-14.0%) to 9.5% (7.7%-11.4%).
- Malaria cases were on the rise while ownership of ITN was declining.
- Own food production (cultivation) was the main source of food in agricultural and agro pastoral zones after households harvested sorghum in the month of August. Households in pastoral zone relied on purchase.
- The pastoral livelihood zone had the highest (19%) households with poor food security status while the agro pastoral zone had the highest (54%) of households with acceptable food security status.
- Bush was the main means of human waste disposal (60%-90%) in Nakapiripirit, Moroto, Kaabong, Kotido and Amudat districts. Abim district had the highest private pit latrine coverage of 55%.

1. Introduction



Karamoja region, located in North Eastern Uganda, covers a total land area of over 27,900 square kilometers with a population of about 1,000,000¹. The region's administrative units and inhabitants are: Nakapiripirit (133,100), Moroto and Napak (265,800), Kotido (188,100), Kaabong (308,000), Abim (54,900), and Amudat (93,600). The region is mostly a semi-arid plain, largely savannah, covered with seasonal grasses, thorny plants, and shrubs. The three livelihood zones (agricultural, agro pastoral and pastoral) were recently split into the following seven zones²

¹ Uganda Bureau of Statistics, Population estimates for 2009

² FEWS Net, June 2010, <http://www.IRINnews.org>

Figure 1: Karamoja region livelihood map

- Karamoja livestock, sorghum, bulrush, millet zone.
- North East sorghum, simsim, maize, livestock zone.
- Pastoral.
- South Kitgum Pader simsim, groundnut, sorghum, cattle zone
- Eastern lowland, maize, beans, rice zone and
- Urban and National park.

The region received 20% to 100% more rainfall than the long term mean rainfall, which allowed pastoral zones to have access to milk and other livestock products, and progress of cropping in agro pastoral and agricultural areas³. The improved availability and access to food is likely to reduce the number of people dependent on food assistance after the harvest period (August/September).

The third round of integrated nutrition surveillance was conducted for a period of two weeks (30th August to 14th September 2010) in six districts based on the following objectives and methodology.

2. Objectives

- ✓ To monitor the nutritional status of children aged between 6 and 59 months.
- ✓ To determine and monitor health, food security and Water, Sanitation and Hygiene (WASH) factors linked to malnutrition.
- ✓ To build the capacity of district nutritionists/focal persons and health workers on running of the surveillance system.
- ✓ To coordinate with DHT and DDMC in order to link the nutrition surveillance system to other early warning systems and build the capacity of districts in preventing and responding to emergencies.

3. Methodology

A three stage cluster sampling method was used to select clusters and households.

In stage one, 25 clusters of 12 households (sample of 300) were randomly selected in each of the 6 districts. The 25 clusters were distributed in each livelihood zone (agricultural, agro pastoral and pastoral) according to population size. This provided an opportunity of data analysis by both districts and livelihood zones. The population in the same livelihood zone is homogeneous and the result is more representative of the actual situation.

In the second stage, accessible population of the villages was entered in EpiInfo/ENA software and clusters assigned randomly.

In the third stage, using the simple ballot system, selected village or manyatta was segmented into units with 12 households (an estimate of one child per household was considered in Karamoja) based on locally accepted boundaries. Data was collected in a randomly selected zone. All children 6 - 59 months in the household were assessed and nutrition security questionnaire administered to all households.

Field work in six districts was conducted between 30th August and 14th September 2010. Five teams comprising of 4 health workers in each team collected data in each district for a period of 5 days. The district nutritionists/focal persons participated in data entry, analysis and reporting for a period of 4 days (16th to 19th September, 2010). Action Against Hunger (ACF) nutrition surveillance staff provided technical support to district nutritionists/focal persons.

The third round of nutrition surveillance achieved the data quality checks outlined in the Uganda Nutrition Survey Methodology Guidelines Amudat district was incorporated and the surveillance system now covers 6 districts in Karamoja. The district nutrition focal persons presented the results on 30th September in the Nutrition Technical Working Group in Abim district for discussion and validation.

³ FEWS Net, June 2010, <http://www.IRINnews.org>

4. Anthropometry results

4.1. Analysis of Acute Malnutrition with EpiInfo/ENA by district

The Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) results in Table 1 below were calculated using EpiInfo/ENA software and SMART flags were excluded.

Flag type	Nakapiripirit	Moroto	Kotido	Kaabong	Abim	Amudat	Total
WHZ SMART flags excluded (N)	300	292	297	304	295	290	1778
WFA SMART flags excluded(N)	300	293	296	303	296	289	1777

Table 1: Nutrition and health status results (the results in brackets are expressed with 95% confidence)

INDEX	INDICATOR	Nakapiripirit	Moroto	Kotido	Kaabong	Abim	Amudat	All districts
WHO (2006)	Global Acute Malnutrition W/H < -2 z and/or oedema	11.0% (7.0%-16.9%)	8.2% (5.2%-12.7%)	10.4% (6.8%-15.6%)	10.2% (6.7%-15.3%)	7.1% (4.8%-10.4%)	8.6% (5.1%-14.3%)	9.3% (7.9%-10.9%)
	Moderate Acute Malnutrition W/H < -2 z & ≥ -3 z no oedema	8.7% (5.2%-14.0%)	6.8% (4.2%-10.9%)	8.4% (5.4%-12.9%)	8.9% (5.8%-13.5%)	5.8% (3.7%-9.0%)	6.9% (4.0%-11.9%)	7.6% (6.3%- 9.1%)
	Severe Acute Malnutrition W/H < -3 z and/or oedema	2.3% (0.9%-5.7%)	1.4% (0.4%-4.7%)	2.0% (0.8%-5.0%)	1.3 % (0.5%-3.4%)	1.4% (0.5%-3.5%)	1.7% (0.6%-4.7%)	1.7% (1.1%- 2.6%)
	Underweight W/A < -2 z	24.7% (19.2%-31.0%)	24.6% (18.5%-31.9%)	21.6% (16.6%-27.7%)	12.9% (9.0%-18.0%)	25.0% (19.6%-31.3%)	11.1% (6.6%-18.1%)	20.1% (17.9%-22.5%)
NCHS (1977)	Global Acute Malnutrition W/H < -2 z and/or oedema	11.2% (7.1%-17.3%)	8.9% (5.7%-13.5%)	8.8% (5.5%-13.7%)	11.5% (7.7%-16.8%)	8.4% (5.5%-12.5%)	7.6% (4.4%-12.8%)	9.4% (7.9%-11.1%)
	Severe Acute Malnutrition W/H < -3 z and/or oedema	2.0% (0.8%-4.8%)	1.0% (0.3%-3.2%)	0.7% (0.2%-2.9%)	1.0% (0.3%-3.0%)	0.0% (0.0%-0.0%)	0.3% (0.0%-2.6%)	0.8% (0.5%- 1.4%)
	Global Acute Malnutrition W/H < 80% and/or oedema	7.9% (5.3%-11.8%)	4.8% (2.3%-9.5%)	4.7% (2.5%-8.6%)	6.2% (3.9%-9.9%)	5.7% (3.7%-8.7%)	5.4% (3.1%-9.5%)	3.7% (2.8% - 5.0%)
	Severe Acute Malnutrition W/H < 70% and/or oedema	0.3% (0.0%-2.6%)	0.3% (0.0%-2.6%)	0.0% (0.0% - 0.0%)	0.3% (0.0%-2.5%)	0.0% (0.0%-0.0%)	0.7% (0.2%-2.9%)	0.2% (0.1% - 0.6%)
MUAC (Height >65 cm)	Global Acute Malnutrition (<125 mm)	11.6% (8.1%-16.1%)	11.9% (8.0%-17.6%)	10.4% (6.4%-16.5%)	8.2% (5.3%-12.4%)	9.0% (6.0%-13.3%)	7.5% (4.1%-13.3%)	9.8% (8.2%-11.6%)
	Severe Acute Malnutrition (<115 mm)	4.0% (2.1%-7.2%)	3.1% (1.4%-6.7%)	1.7% (0.6%-4.7%)	1.3% (0.5%-3.3%)	2.0% (0.7%-5.5%)	0.7% (0.2%-2.8%)	2.1% (1.6%- 2.9%)
SAM / MAM cases referred		4 / 6	4 / 11	2 / 11	4 / 10	10 / 12	4 / 8	28/58
Child morbidity in previous 2 weeks		72.6%	85.3%	80.3%	84.9%	90.3%	63.6%	79.5%

The results of the previous Nutrition surveillance rounds are represented in the tables 2 and 3 below:

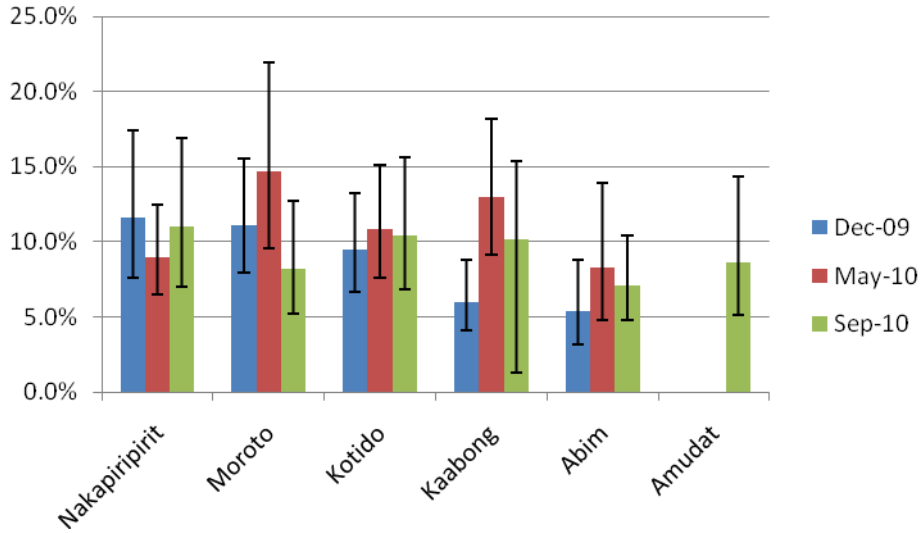


Figure 2: Trends of GAM in districts of Karamoja region collected through Nutrition Surveillance

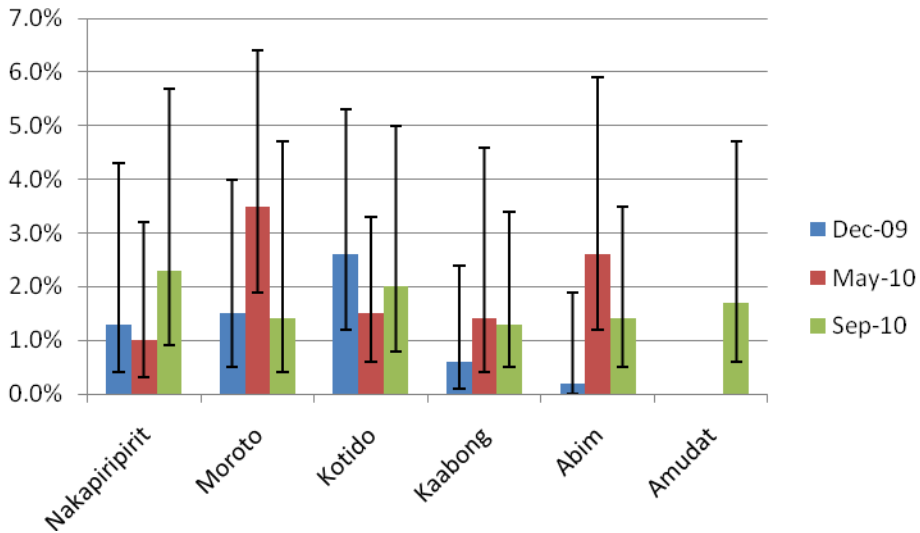


Figure 3: Trends of SAM in districts of Karamoja region collected through Nutrition Surveillance

The statistical comparison of these data with the ones of the previous surveillance round in May 2010 shows that:

- ⇒ There are a significant declines in GAM and SAM of Moroto district (p value < 0.15)
- ⇒ Other differences observed in GAM and SAM in other districts are not significant.

4.2. Analysis of Acute Malnutrition with EpiInfo/ENA by livelihood zones

The anthropometry data collected from livelihood zones is not sampled strictly on probability proportional to population size and hence the data is weighted and analyzed using complex sample frequency statistic in EpiInfo 3.5. The trend results are illustrated in Table 2, Figure 4 and 5.

Table 2: Nutritional status by livelihood zone (WHO standards)

Livelihood zone	Indicator	Dec 2009	May 2010	September 2010
Agricultural (Dec 2009, N=709) (May 2010, N=565) (Sep 2010, N=616)	Global Acute Malnutrition W/H < -2 z and/or edema	10.3% (6.9%-13.7%)	12.9% (7.9%-17.8%)	10.9% (6.7%-15.2%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.5% (0.0%-3.1%)	2.3% (0.9%-3.7%)	2.1% (0.7%-3.5%)
Agro-pastoral (Dec 2009, N=416) (May 2010, N=375) (Sep 2010, N=457)	Global Acute Malnutrition W/H < -2 z and/or edema	8.8% (5.4%-12.1%)	8.9% (5.5%-12.3%)	6.6% (4.0%-9.2%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.4% (0.1%-2.7%)	1.4% (0.1%-2.7%)	0.6% (0.0%-1.5%)
Pastoral (Dec 2009, N=650) (May 2010, N=593) (Sep 2010, N=705)	Global Acute Malnutrition W/H < -2 z and/or edema	9.4% (7.0%-11.8%)	12.8% (9.6%-16.0%)	10.5% (7.8%-13.2%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	2.1% (0.8%-3.5%)	1.6% (0.5%-2.7%)	1.9% (0.7%-3.2%)
Global (Dec 2009, N=1775) (May 2010, N=1533) (Sep 2010, N=1778)	Global Acute Malnutrition W/H < -2 z and/or edema	9.5% (7.8%-11.2%)	11.8% (9.6%-14.0%)	9.5% (7.7%-11.4%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.8% (0.9%-2.6%)	1.8% (1.1%-2.5%)	1.6% (0.9%-2.3%)

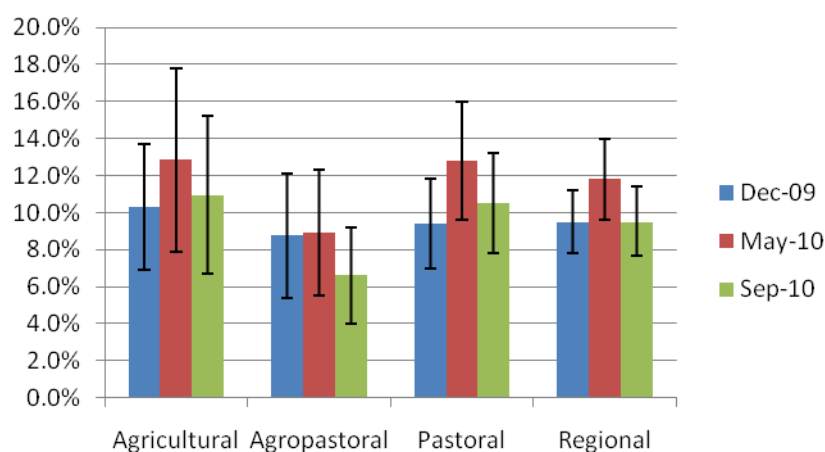


Figure 4: Global Acute Malnutrition by livelihood zone (WHO standards)

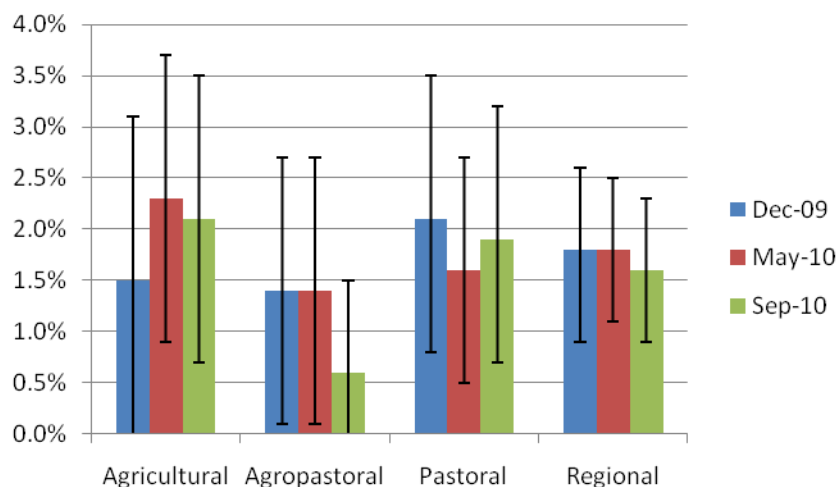


Figure 5: Severe Acute Malnutrition by livelihood zone (WHO standards)

4.3. Analysis of Acute Malnutrition with CDC calculator by district

Small sample survey results have low precision while the 95% confidence interval is considered too tight in a surveillance system. In order to fine-tune the analysis, the CDC calculator was used for the calculation of the prevalence with $\geq 85\%$.

The GAM and SAM results in table 3 above are both below the emergency threshold of 15% and 4% respectively.

Table 3: GAM and SAM results expressed with $\geq 85\%$ probability to exceed threshold

District	Global Acute Malnutrition W/H < -2 z and/or oedema	Severe Acute Malnutrition W/H < -3 z and/or oedema
Nakapiripirit	8.7%	1.3%
Moroto	6.5%	0.6%
Kotido	8.3%	1.1%
Kaabong	8.2%	0.7%
Abim	5.6%	0.8%
Amudat	6.5%	0.9%

The statistical comparison of these data with the ones of the previous surveillance round in May 2010 shows that:

- ⇒ There are a significant declines in GAM and SAM of Moroto district (p value < 0.15)
- ⇒ Other differences observed in GAM and SAM in other districts are not significant.

4.4 Analysis of Acute Malnutrition with CDC calculator by livelihood zone

Using CDC probability calculator at $\geq 85\%$ precision, the agro pastoral zone had lower malnutrition threshold compared to agricultural and pastoral zones (Table 4). The Karamoja Global Acute Malnutrition rate was 9.5% (7.7%-11.4%). This rate is similar to December 2009 results while the decline between May and September is significant [p value < 0.15, GAM declined from 11.8% (9.6%-14.0%) to 9.5% (7.7%-11.4%)].

Table 4: GAM and SAM results expressed with $\geq 85\%$ probability to exceed threshold by livelihood zone.

Livelihood zone	Global Acute Malnutrition W/H < -2 z and/or oedema	Severe Acute Malnutrition W/H < -3 z and/or oedema
Agricultural	5.3%	1.1%
Agropastoral	8.8%	0.3%
Pastoral	9.0%	1.2%

4.5 Analysis of underweight by district

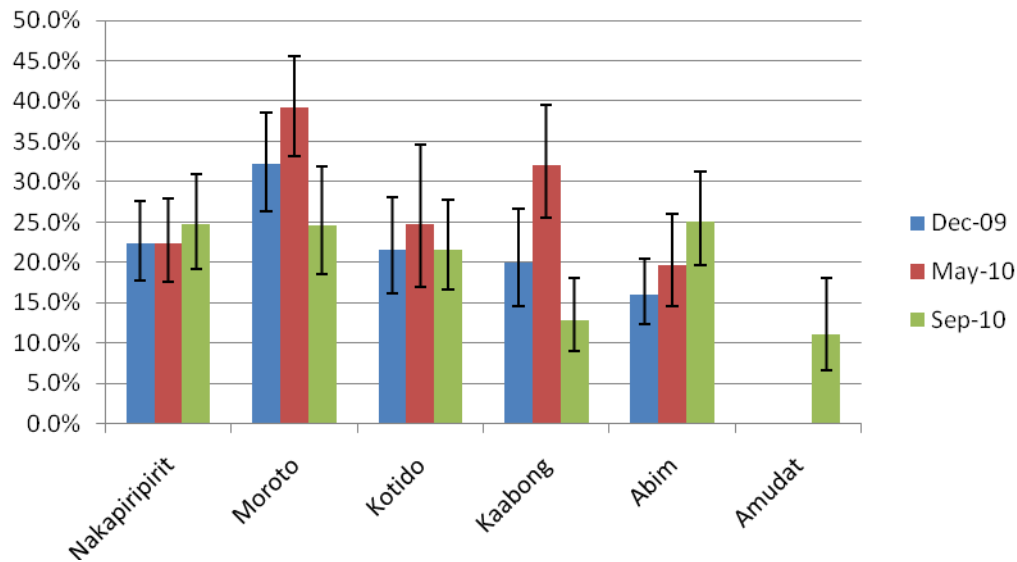


Figure 4: Trends of underweight (WHO standards)

In the month of August, underweight prevalence calculated by EPIINFO/ENA was in the serious category (20-29.9%) in 4 districts (Nakapiripirit, Moroto, Kotido and Abim).

Based on CDC calculator, underweight prevalence in Moroto district declined significantly (p value <0.15) from 39.2% (33.2%-45.5%) to 24.6% (18.5%-31.9%). Kaabong district had similar decline in underweight prevalence. The changes in wasting and underweight followed a similar decline trend in the above mentioned districts.

4.6 Analysis of underweight by livelihood zone

Underweight results by livelihood zone were included for the first time in the round of September. The results obtained are indicated in the table below:

Table 4: Underweight results by livelihood zone

Livelihood zone	Indicator	September 2010
Agricultural N= 616	Total underweight W/A< -2 z	21.8% (17.1%-26.6%)
	Severe underweight W/A< -3 z	5.9% (3.7%-8.0%)
Agro-pastoral N= 457	Total underweight W/A< -2 z	16.2% (12.8%-19.5%)
	Severe underweight W/A< -3 z	2.7% (1.4%-3.9%)
Pastoral N=705	Total underweight W/A< -2 z	19.9% (15.9%-24.0%)
	Severe underweight W/A< -3 z	6.6% (3.8%-9.4%)

The total underweight was classified as poor/medium in the agro pastoral zone while in the agricultural and

pastoral, it was classified as serious/high. Analysis with CDC calculators will be done in the subsequent rounds.

5. Health Indicators

Health indicators are summarized in figure 7:

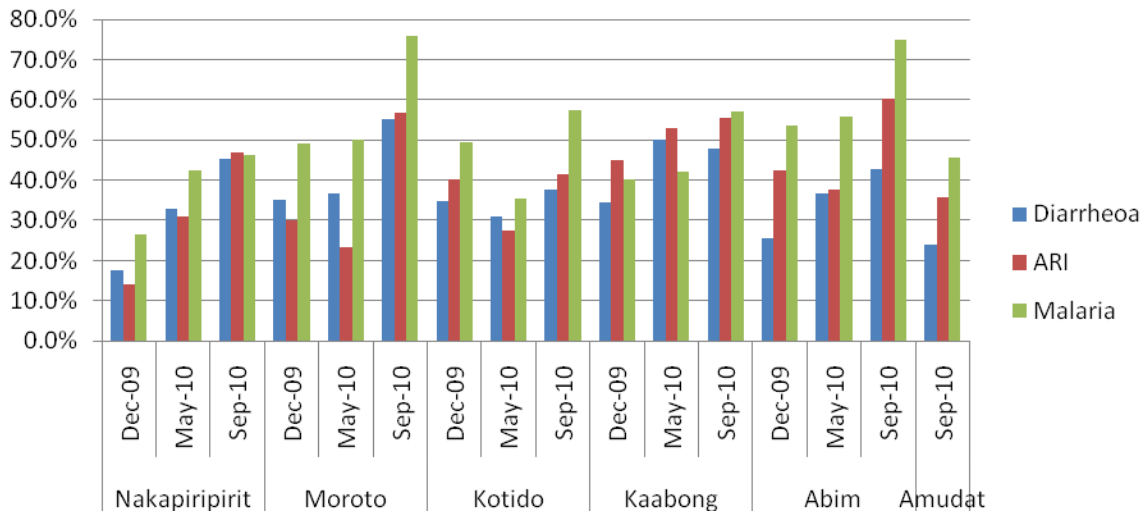


Figure 5: Childhood illnesses, 2 weeks retrospective assessment

Malaria cases increased across all districts (Figure 7) with Moroto and Abim recording the highest prevalence (>70%). The upsurge in malaria cases was expected given the rain season, declining mosquito net ownership and lack of antimalarial drugs. Clinic based data obtained for one of the districts (Moroto) showed an increase of malaria cases in the last quarter of 2009. In the year 2010, clinic data could have been skewed by lack of antimalarial drugs and hence not representative of the true picture.

Insecticide Treated Net (ITN) ownership was on the decline from 70%-90% in December 2009 to 40%-80% in September 2010. Households in Amudat and Nakapiripirit districts had the lowest ITN ownership (<50%). Among households (40%-80%) that owned ITN, over 70% of children below 5 years slept under ITN in all districts with exception of Kaabong (Figure 8). Shortage of anti malarial drugs in the districts was reported by Nutrition Surveillance focal persons.

Cases of diarrhea and Acute Respiratory Infection (ARI) also increased compared to May 2010 results. However, Kaabong district registered a decrease in diarrhea cases. The increase in diarrhea is attributed to increased utilization of unsafe water from seasonal streams, unprotected wells, and low hand washing practices with soap and poor pit latrines coverage across the region.

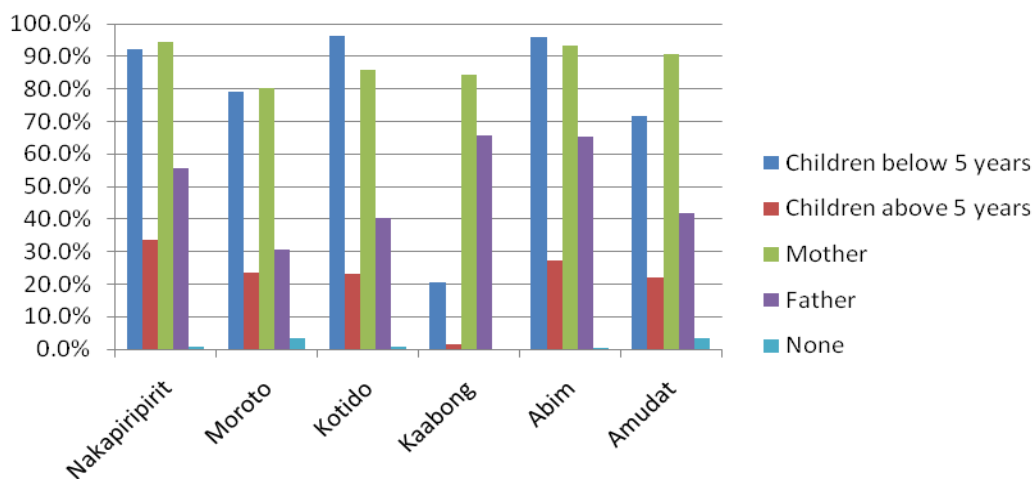


Figure 6: Usage of ITN by household members

6. Food Security and Livelihood Indicators

Main food sources

Buying which was the main source of food in the month of May declined by approximately 20% in September as households depended more on cultivation after harvesting Sorghum in August (Figure 9). It was the first harvest in 3 years of failed harvests. The region received 20% to 100% more rainfall than the long term average. This provided good conditions for livestock and crop productivity.

Households in pastoral areas depended mostly on buying food. Households in agro pastoral areas depended mainly on buying and cultivation. In the agricultural zone, cultivation was the main source of food. On average kinship support declined from 1.7% in May to 0.3% in September.

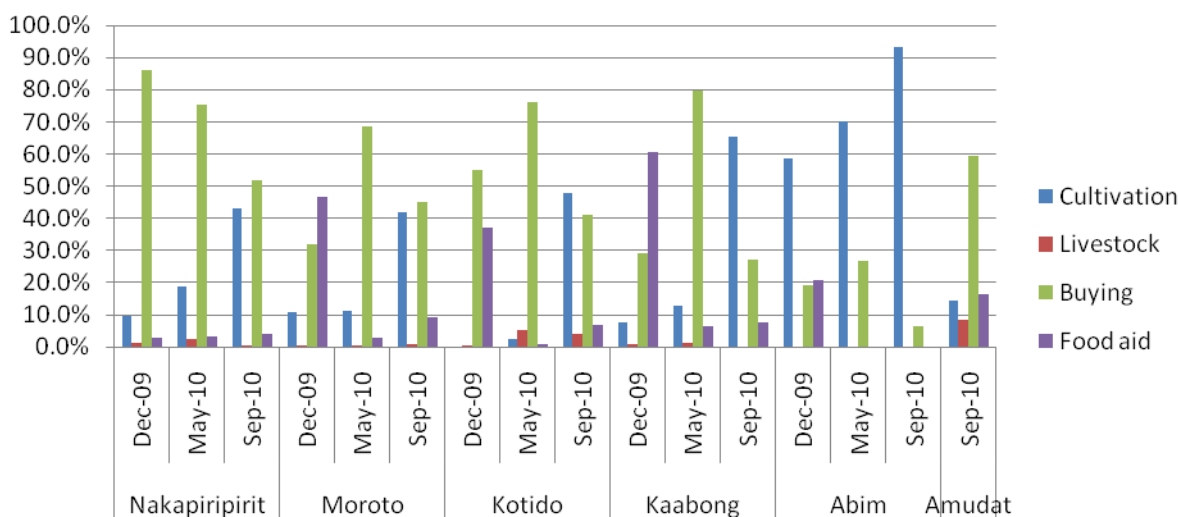


Figure 7: Food sources

Household Dietary Diversity Score (HDDS)

A 24 hour food recall period was used to assess foods consumed by household members within the household. HDDS increased by decimal points between May and September (mean range from 4-5 on a scale of 12). Mean HDDS (approximately 4.7) was also found to be similar across the livelihood zones. Most households consumed cereals, vegetables, pulses, oils and spices.

Food Consumption Score (FCS)

Amudat and Nakapiripirit districts had over 60% of households with acceptable food security status. Moroto, Kotido and Kaabong districts had 10%-20% households falling under poor food security status. About 50% of the households in Abim, Kotido and Kaabong districts fell under the borderline category (Table 5).

Table 5: Food Consumption Scores

FCS cut-offs	Nakapiripirit	Moroto	Kotido	Kaabong	Abim	Amudat	Agricultural	Agropastoral	Pastoral
Poor	7.3%	15.7%	19.7%	21.3%	6.0%	8.7%	8.5%	11.5%	19.1%
Borderline	27.0%	32.0%	43.3%	45.7%	56.3%	19.3%	45.0%	35.0%	37.3%
Acceptable	65.7%	52.3%	37.0%	33.0%	37.7%	72.0%	46.5%	53.5%	43.6%

The pastoral livelihood zone had the highest (19%) households with poor food security status while the agro pastoral zone had the highest (54%) of households with acceptable food security status. Districts like Moroto, Kotido and Kaabong with more pastoral areas had the highest percent of households with poor food security status.

Consumption of food groups with high nutritional value in term of protein in children’s growth and development is illustrated in **Figure 10** below:

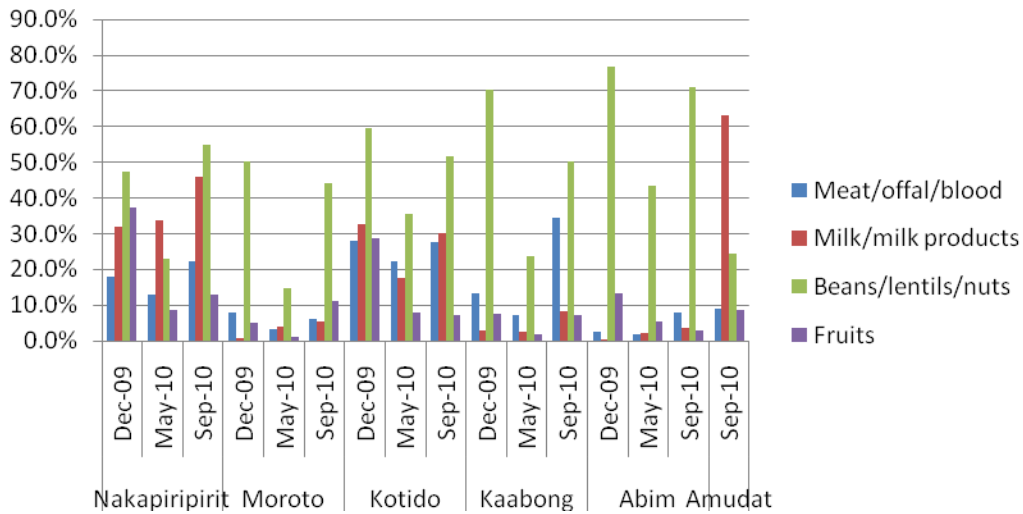


Figure 8: Consumption of food groups for growth and development

The consumption of proteins (meat/offal/blood, milk/milk products, beans) increased while fruits had no significant change in Nakapiripirit, Moroto, Kotido, Kaabong and Abim. Milk consumption was highest in Amudat (63.3%) while in Moroto, Kaabong and Abim it remained low.

Frequency of meals

Assessment of frequency of meals was based on children 6-23 months (Figure 11). Most households (55%-73%) in Nakapiripirit, Moroto, Kotido and Kaabong fed children on 2 meals per day with exception of Amudat (3 meals). The changes in consumption of three meals were as follows: Nakapiripirit (24.3% to 19.9%), Moroto (17.8% to 8.1%), Kotido (21.7% to 35%), Kaabong (12.6% to 23.5%), and Abim (11.7% to 24.5%). Across the region, 48.4% adults consumed one meal and 41.2% consumed two meals in the last 24 hours.

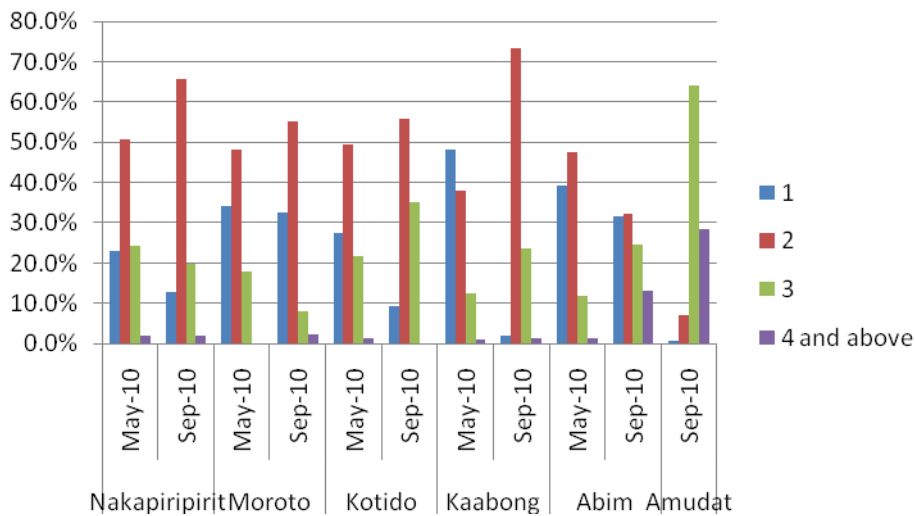


Figure 9: Frequency of meals

7. Water Sanitation and Hygiene (WASH) Indicators

The main source of drinking water was borehole (70% and above) in the region although a reduction was noted as compared to 80% and above in May 2010 (Figure 12). However, Amudat district has the least percentage of households (49.3%) using bore hole as their main source of drinking water. Households using unsafe water sources such as seasonal streams and ponds increased in Nakapiripirit (Napienanya, Loregae, Narisae and Nakobekobe parishes), Abim (Katabok), Amudat (Lokeles, Looro, Katabok, Loburin parishes) and Moroto (Cholicholi, Lia, Tapach, Nakwamoru and Nakwamoru parishes).

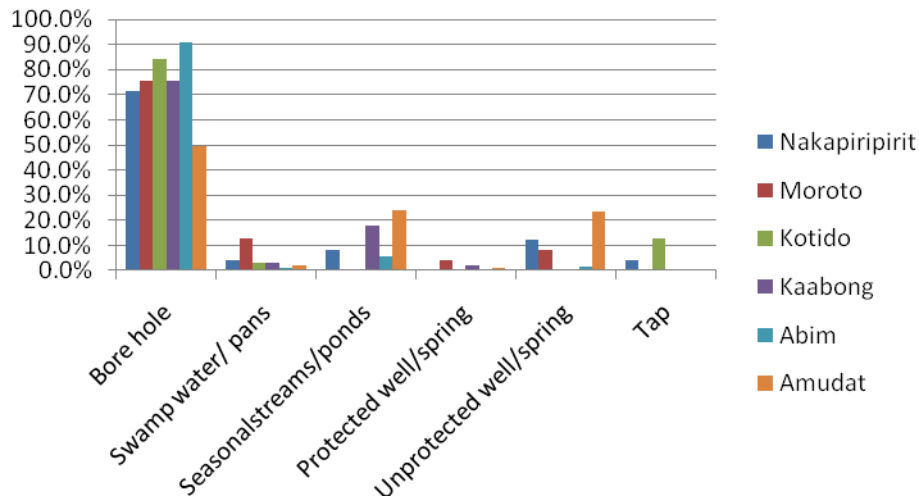


Figure 10: Drinking water sources

Bush was the main means of human waste disposal (60%-90%) in Nakapiripirit, Moroto, Kaabong, Kotido and Amudat (Figure 13). However, a reduction of about 5% was noted as marginal increase in use of private pit latrine was reported. Abim district had the highest private pit latrine coverage (55%).

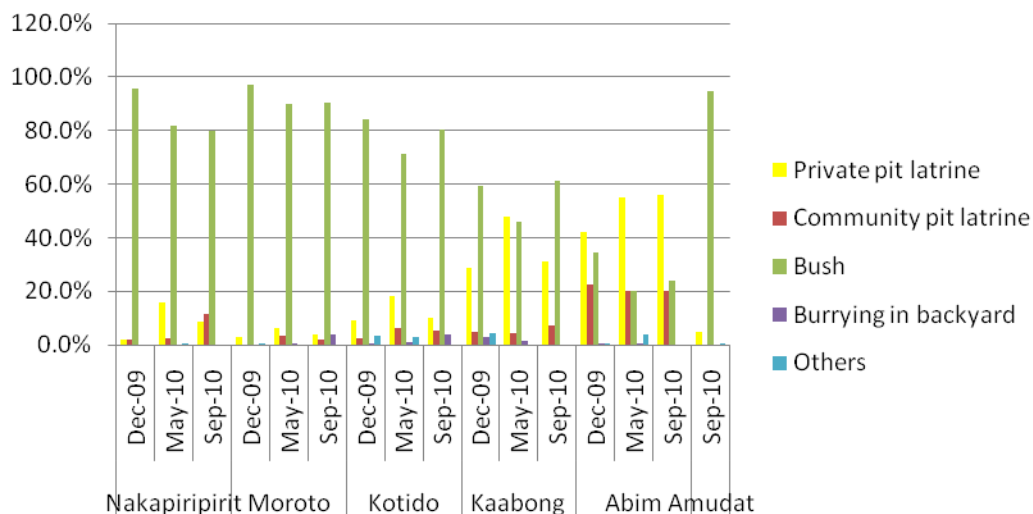


Figure 11: Human waste disposal

The factors linked to malnutrition in each district are summarized below.

Nakapiripirit: Low Insecticide Treated Net ownership (<50%) and increase in malaria cases. Poor access to improved sanitation facilities contribute to diseases like diarrhea). The young children were fed on 2 meals per day against

recommended 3 meals and snacks. However, the district had 65.7% of its households with an acceptable food consumption score.

Moroto: Households that had poor food consumption score were 15.7% and over 50% of households fed children on 2 meals per day. Increase in diarrhoea, ARI and malaria (>70%), decline in ITN ownership, increased utilization of unsafe water sources, and low pit latrine usage. Distribution of Plumpy Doz in early August prevented more children from being malnourished.

Kotido: Households with poor food consumption were 19.7%; children were fed on 2 meals per day, and increase in malaria and diarrhoea.

Kaabong: Households with poor food security status were 21.3%, low percent of under five children slept under ITN and low consumption of milk.

Abim: Malaria cases were high (70%), low consumption of milk, and feeding children on 2 meals per day.

Amudat: Inadequate enrolment in feeding program(OTC lacked new admissions for 2 months and only 4 children were in the program while supplementary feeding program was not initiated). Malaria cases (63.5%) were high yet ITN possession among households was (50%). There was low access to safe drinking water (49.3%) when compared to other districts.

8. Conclusion

Results in this report will be shared with District Health Team (DHT) and District Disaster Committees (DDMC) to advocate for action on the recommendations. DHO/ACF will also discuss the results with other information systems and contribute to Integrated Phase Classification.

Global and Severe Acute Malnutrition declined significantly in Moroto district (p value <0.15).

The Karamoja Global Acute Malnutrition rate was 9.5% (7.7%-11.4%). The decline between May and September was significant [p value <0.15, GAM declined from 11.8% (9.6%-14.0%) to 9.5% (7.7%-11.4%)].

The next of nutrition surveillance will be conducted in December 2010.

9. Recommendations

- > To strengthen detection, referral, treatment and prevention of severe and moderate acute malnutrition based on IMAM guidelines in all districts of Karamoja sub region.
- > To implement the Infant and Young Child Feeding package.
- > To strengthen own food production and purchasing capacity as households rely mainly on cultivation and market purchase.
- > To build capacity of health promoters' especially Environmental Health staff on CLTS, PHAST and other approaches for Sanitation and Hygiene promotion.
- > For the surveillance system to link with the Early Warning System and contribute to Integrated Phase Classification mapping.