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**Nutrition Surveillance**  
**Karamoja Region,**  
**Uganda**  
**Round 7, December 2011**

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## **Acknowledgments**

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## Summary of key findings

- GAM in Karamoja was 8.1% (6.9-9.5 95% CI) and SAM 1.7% (1.3-2.3 95% CI) based on weight for height Z-scores (WHO Growth Standards). There was no significant change between GAM and SAM rates from September 2011 and December 2011 ( $p>0.05$ )
- Moroto/Napak recorded the highest rates of acute malnutrition in December 2011 with GAM 10.9% (8.4-14.4, 95% CI) and SAM 2.5% (1.4-4.2 95% CI). There was no significant difference between September 2011 and December 2011 ( $p>0.05$ )
- GAM within Livelihood Zones of Karamoja remain below 10% GAM, with Agricultural, Agropastoral and Pastoral zones reporting 7.6% (5.6-9.6 95% CI), 8.5% (6.3-10.7 95% CI) and 8.4% (6.3-10.5 95% CI) respectively.
- Illness among children 6-59 months surveyed was very high, with 72.2% of children reported having an acute infection within 2 weeks prior to survey.
- Acute Respiratory Infection was the most reported illness in children at 65.0% of children surveyed. Malaria followed closely at 64.2%.
- 82.9% of children with acute malnutrition (GAM) suffered from infectious illness 2 weeks prior to surveillance round.
- Coverage of Measles vaccinations for children older than 12 months for all districts is greater than 90%
- Children receiving Vitamin A supplementation in the past 6 months was greater than 90% in all districts, except for Moroto/Napak which fell just below at 87.8%
- Mean household food consumption scores (FCS) increased in Amudat, Kotido and Nakapiripirit.
- Food insecure households have decreased in Karamoja to 8.2% of households from 15.5% in September 2011. Borderline and acceptable households being 33.4% and 55.4%, respectively.
- Cultivation remains the main source of food in Karamoja, with the exception of Moroto where purchasing of food is the main source.
- The main source of income for households is the collection and selling of firewood/charcoal (32.4%), with the selling of local brews (22.3%) the second main source. The selling of brew has increased in Kaabong to be the main source of income (38.3%)
- The dietary diversity of children (6-23 months) remains poor, with 71.8% of children consuming 3 or less food groups in the previous 24 hours
- Children (6-23 months) predominantly consume only 2 meals per day, less than the minimum of required standard of 3 meals per day,
- 83.0% of children in Karamoja receive unacceptable diets (combined dietary diversity and frequency of meals)
- Exclusive Breast feeding is practiced by 56.6% of households in Karamoja
- Water is sourced mainly by boreholes in Karamoja (84.2%)
- The average time to walk to water sources is 20 minutes throughout Karamoja. Households in Nakapiripirit have the shortest time to access water (9 minutes) and Kaabong the longest (32 minutes)
- The disposal of human waste in the bush remains the main practice in Karamoja (67.8% of Households)



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- to monitor health and morbidity, food security and livelihoods (FSL), and water, sanitation and hygiene (WASH) factors linked to acute malnutrition,
- to collect data three times a year in May (lean season), August/September (pre-harvest) and December (post-harvest),
- to build the capacity of district nutrition focal persons (DNFP) and health workers on implementing and running a nutrition surveillance system, and
- to strengthen DHOs skills to identify acute malnutrition trends, through the monitoring of aggravating factors of acute malnutrition, and contributing to the design of appropriate interventions accordingly.

## 1.2 Nutrition surveillance Methodology

Household was the **sampling unit** and the **sample size** was **480** for each district.

A **multi-stage cluster sampling** method was used to select the 480 households per district with a 30 clusters of 16 households design.

For each given district, **village populations** were entered in ENA software for random selection of clusters.

For selected villages with more **than 4 manyattas**<sup>5</sup>, a ballot system was used to randomly select **4 manyattas** and systematic random sampling used to select **4** households from each selected manyatta.

In villages with only **3 manyattas**, 6 households are selected from one manyatta and remaining 10 from the two manyattas (5 households from each), for villages with **2 manyattas**, 8 households selected from each while villages with only **one manyatta** had all the 16 households selected from it. In places with **no manyatta** settings, the village was divided into four segments based on locally accepted boundaries and 4 households selected from every segment using systematic random sampling.

Nutrition security questionnaire was administered to all selected households and anthropometric measurements carried on children 6 – 59 months within selected households.

Data was entered in ENA for SMART (May 4<sup>th</sup>, 2011 version) to determine nutritional indicators of Weight for Height (WHZ), Weight for Age (WAZ) and Height for Age (HAZ) z-scores using WHO 2006 Standards. Design weights were added to each district (total population divided by number of respondents) to perform a regional weighted analysis using EPIINFO 3.5.3. CDC Calculators using NCHS 1977 reference in **Annex 6** are presented in order to compare earlier survey results with the current ones.

Data on children identified with flagged reference values for WHZ were checked, confirmed to be correct, therefore analysis was run without exclusion. Malnourished children identified during the survey were referred to the appropriate nutrition program according to their WHZ.

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<sup>5</sup> **Manyatta** is a cluster of traditional Tukul huts, which can accommodate up to 300 people individually and communally surrounded by briar enclosure



## 2 Results

A total of 2,878 out of 2,880 households were interviewed and 3035 children 6 to 59 months were measured. The table below gives relevant information on households interviewed, children measured, replaced households, absent households and missing children.

**Table 1: Information related to sample size, replaced/absent households and missing children**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Households interviewed	480	478	480	480	480	480	2878
Children measured	557	531	448	444	619	436	3035
Replaced households	0	0	0	0	0	0	0
Absent households	0	2	0	0	0	0	2
Missing children	0	12	0	0	10	0	22

Regional gender ratio was 0.99:1, female to male respectively. A high age ratio indicates an over representation of children below 30 months. For Karamoja Region age ratio (6-29 months/30-59 months) was 1.32. At district level, age ratios varied as identified in **Table 2**, high ratios in Nakapiripirit and Kotido contributed to this variation in age selection for the region. This trend of age variation/selection has occurred throughout all seven rounds of surveillance in Karamoja ranging from 2.0 in Round 3 (September 2010) to an overall improvement in Round 7 (December 2011) of 1.32.

In Karamoja, age estimation is more difficult with children closer to 59 months due to of an often poor parental recall of birthdays and lack of documented birthdates in available resources, such as vaccination cards. Therefore, over concerns of including children older than 59 months, larger/taller children are presumed to exceed 59 months and are excluded from screening which may lead to the high age ratio.

**Table 2: Age ratio for children 6-29/30-59 months per district**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Age Ratio (6-29 months/30-59 months)	1.36	0.93	1.02	1.46	1.39	2.18	1.32

### 2.1 Anthropometric Indicators

**GAM** in Karamoja was **8.1%** (6.9-9.5 95% CI) and **SAM 1.7%** (1.3-2.3 95% CI) based on weigh for height Z-scores (WHO Growth Standards). There was no significant difference between the December 2011 results and the September 2011 prevalence rates of **9.1%** (7.9-10.4, 95% CI) ( $p < 0.05$ ). In addition there no significant difference between the prevalence rates identified in December 2011 and December 2010 ( $p > 0.05$ )

Moroto/Napak showed a higher prevalence of GAM 10.9% (8.4-14.4, 95% CI) and SAM 2.5% (1.4-4.2 95% CI). With was a reduction since September, but remains within the serious threshold for levels of GAM. Prevalence rates in Moroto was lower in 2011, reducing from 16.3 (11.8-22.1 95% CI) ( $p < 0.05$ )

**Table 3: W/H – Z (wasting) among 6- to 59-month children per district, WHO 2006 Growth Standards**

Indicator	Abim (95% CI)	Amudat (95% CI)	Kaabong (95% CI)	Kotido (95% CI)	Moroto Napak (95% CI)	Nakapiripirit (95% CI)	Karamoja (95% CI)
<b>GAM</b> W/H < -2 z and/or oedema	<b>6.3%</b> (4.0-9.6)	<b>7.0%</b> (4.4-11.0)	<b>8.4%</b> (6.2-11.4)	<b>6.8%</b> (4.8-9.6)	<b>10.9%</b> (8.2-14.4)	<b>9.2%</b> (6.2-13.3)	<b>8.1%</b> (6.9-9.5)
<b>SAM</b> W/H < -3 z and/or oedema	<b>1.1%</b> (0.5-2.6)	<b>0.9%</b> (0.3-2.3)	<b>2.3%</b> (1.4-4.0)	<b>1.8%</b> (0.9-3.5)	<b>2.5%</b> (1.4-4.2)	<b>1.4%</b> (0.5-3.8)	<b>1.7%</b> (1.3-2.3)



**Table 4: H/A-Z (Stunting) and W/A-Z (Underweight) among 6 to 59 month children per district, WHO 2006 Growth Standards**

Indicator	Abim (95% CI)	Amudat (95% CI)	Kaabong (95% CI)	Kotido (95% CI)	Moroto Napak (95% CI)	Nakapiripirit (95% CI)	Karamoja (95% CI)
<b>Stunting</b> H/A< -2 z-score	<b>30.0%</b> (24.7-35.9)	<b>10.6%</b> (7.1-15.5)	<b>17.2%</b> (11.6-24.8)	<b>42.0%</b> (36.9-47.3)	<b>42.9%</b> (37.4-48.7)	<b>36.7%</b> (31.8-41.9)	<b>30.5%</b> (28.8-32.2)
<b>Underweight</b> W/A< -2 z-score	<b>17.2%</b> (13.1-22.3)	<b>7.0%</b> (4.6-10.5)	<b>13.1%</b> (9.1-18.4)	<b>25.5%</b> (21.0-30.7)	<b>31.1%</b> (26.5-36.6)	<b>24.1%</b> (19.8-29.0)	<b>20.1%</b> (18.2-22.0)

**Table 5: MUAC Results of Children per district**

Indicator	Abim (95% CI)	Amudat (95% CI)	Kaabong (95% CI)	Kotido (95% CI)	Moroto Napak (95% CI)	Nakapiripirit (95% CI)	Karamoja (95% CI)
<b>GAM</b> (<125 mm)	<b>6.0%</b> (3.6-10.0)	<b>4.7%</b> (0.3-7.4)	<b>7.4%</b> (5.1-10.4)	<b>8.2%</b> (4.9-13.4)	<b>11.9%</b> (8.4-16.4)	<b>11.5%</b> (7.4-17.4)	<b>8.3%</b> (6.8-10.2)
<b>SAM</b> (<115 mm)	<b>1.3%</b> (0.6-2.9)	<b>0.2%</b> (0.0-1.7)	<b>0.5%</b> (0.2-1.7)	<b>1.9%</b> (1.0-3.8)	<b>2.8%</b> (1.6-5.0)	<b>2.1%</b> (0.9-4.7)	<b>1.5%</b> (1.1-2.1)

Classification of malnutrition categorized by interpretation levels shown in **Table 6** are based on the following<sup>6</sup>

- Wasting: Acceptable (0-5%) / Poor (5%-9%) / Serious (10%-14%) / Critical (≥15%);
- Stunting: Low (less than 20%) / Medium (20%-29%) / High (30%-39%) / Very High (≥ 40%);
- Underweight: Low (<10%) / Medium (10%-19%) / High (20%-29%) / Very High (≥ 30%).

**Table 6: GAM expressed according to the WHO classification of malnutrition prevalence**

Indicator	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Wasting	Poor	Poor	Poor	Poor	Serious	Poor	Poor
Stunting	High	Low	Low	Very High	Very High	High	High
Underweight	Medium	Low	Medium	High	Very High	High	High

According the WHO classification Moroto district remains in a serious, while this is a lower classification than December 2010, which was critical, it shows that already post-harvest there is a situation that needs to be monitored closely as the lean period approaches in May. situation in regards to under 5 year old malnutrition, while all other districts remain poor. While there are significant reductions in the GAM throughout the districts from May through to December, Moroto continues to have consistently high rates, similarly for underweight children.

## 2.1.1 Trend Analysis Nutrition Indicators in 2011

The December 2011 rate of GAM for Karamoja is the lowest since the beginning of nutritional surveillance (December 2009) at 8.1% (6.9-9.5 95% CI). Rounds of nutrition surveillance pre and post harvest periods (September and December) show decreased prevalence rates of global acute malnutrition.

Nakapiripirit prevalence rates of malnutrition continue to drop since May 2011, where high rates of 20.4% were reported ( $p < 0.05$ ).

While point prevalence rates in Moroto appear to have decreased there is no significant difference in the results from May 2011 to December 2011 ( $p > 0.05$ ).

Abim and Kaabong prevalence rates remain relatively stable since Mays round of surveillance.

Amudat and Kotido have seen decreases in point prevalence rates from May to September and then stabilization from September to December.

<sup>6</sup>WHO. 1995 The management of nutrition in major emergencies

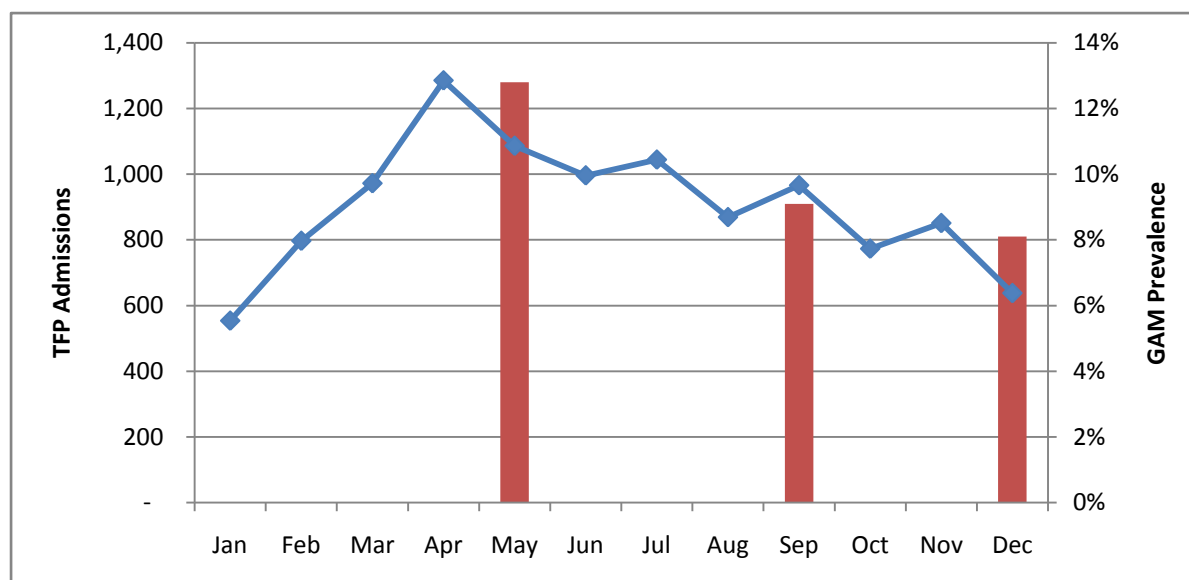


**Table 7: Prevalence Rates of GAM 2011 in Karamoja by District (May, September and December)**

Indicator	Abim (95% CI)	Amudat (95% CI)	Kaabong (95% CI)	Kotido (95% CI)	Moroto Napak (95% CI)	Nakapiripirit (95% CI)	Karamoja (95% CI)
<b>Dec-11</b>	<b>6.3%</b> (4.0-9.6)	<b>7.0%</b> (4.4-11.0)	<b>8.4%</b> (6.2-11.4)	<b>6.8%</b> (4.8-9.6)	<b>10.9%</b> (8.2-14.4)	<b>9.2%</b> (6.2-13.3)	<b>8.1%</b> (6.9-9.5)
<b>Sep-11</b>	<b>6.9%</b> (4.2-11.3)	<b>9.2%</b> (6.3-13.1)	<b>8.6%</b> (5.9-2.4)	<b>6.7%</b> (5.0-8.9)	<b>12.5%</b> (9.4-16.5)	<b>11.2%</b> (8.6-14.6)	<b>9.1%</b> (7.9-10.4)
<b>May-11</b>	<b>8.6%</b> (5.7-12.7)	<b>11.9%</b> (7.9-17.7)	<b>8.5%</b> (5.8-12.3)	<b>14.1%</b> (10.5-18.6)	<b>13.3%</b> (8.9-19.3)	<b>20.4%</b> (16.0-25.6)	<b>12.8%</b> (11.0-14.9)

Overall trends across the region show a lowering of rates of GAM from May through to December, except for Kaabong which remain consistent around 8.5%. The rates of GAM follow similar trends to admissions in Therapeutic feeding in Karamoja, where peaks in admissions were seen in April and May of 2011 and decreased by almost 50% in December 2011. **Figure 2** provides a visual representation of the admission rates in all seven districts as compared to nutritional surveillance in 2011.

**Figure 2: Karamoja Nutritional Surveillance and Therapeutic Feeding Admissions 2011**



## 2.1.2 Nutrition Indicators by Livelihood

In order to give a more comprehensive understanding of malnutrition across the three livelihood zones, weighted analysis is conducted (**Table 8**). Rates with each of the livelihood zones remain “poor” as per the WHO classification of acute malnutrition. Stunting (**Table 9**) for both Agricultural and Agro-pastoralist remain “High”, while pastoralists fall just into “medium” classification.

**Table 8: Acute Malnutrition (wasting) by Livelihood Zones, WHO 2006 Standards**

Indicator	AGRICULTURAL (95% CI)	AGRO-PASTORAL (95% CI)	PASTORAL (95% CI)
<b>GAM</b> W/H < -2 z and/or oedema	<b>7.6%</b> (5.6-9.6)	<b>8.5%</b> (6.3-10.7)	<b>8.4%</b> (6.3-10.5)
<b>SAM</b> W/H < -3 z and/or oedema	<b>1.4%</b> (0.6-2.2)	<b>1.9%</b> (0.9-3.0)	<b>2.0%</b> (1.0-3.0)

**Table 9: Stunting and underweight weighted analysis by livelihood zones, WHO 2006 standards**

Indicator	AGRICULTURAL (95% CI)	AGRO-PASTORAL (95% CI)	PASTORAL (95% CI)
<b>Stunting</b> H/A< -2 z	<b>31.0%</b> (26.9-35.0)	<b>31.2%</b> (25.5-36.9)	<b>29.5%</b> (24.6-34.2)
<b>Underweight</b> W/A< -2 z	<b>19.8%</b> (16.5-23.1)	<b>21.8%</b> (17.4-26.3)	<b>19.0%</b> (15.7-22.3)

### 2.1.3 Treatment for Malnutrition

A total of 133 malnourished children were identified and referred to health centres during data collection process (37 SAM and 96 MAM referrals, **Table 10**). As nutritional surveillance covers all villages in all districts, those with and without access to health services are included into the identified and referred cases, therefore the numbers of children being currently treated should not act as a proxy for program coverage but as a reference to those referred and those currently in treatment.

**Table 10: Children (6 to 59 months) referred to nutrition treatment programs during surveillance**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
OTP	3	2	4	10	11	7	37
SFP	8	15	15	9	27	22	96
Total	11	17	19	19	38	29	133

**Table 11: Children (6 to 59 months) surveyed currently enrolled treatment for malnutrition at the time of the survey**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
OTP	4	1	5	13	10	10	43
SFP	23	5	29	71	56	12	196
Total	27	6	34	84	66	22	239

## 2.2 Health Indicators

### 2.2.1 Morbidity Results

Carers of children were asked to identify whether the child had suffered from illness within the two weeks prior to the surveillance round in December. Overall, more than 72% of children reported illness. While Amudat reported 59.7%, these rates remain high. Many children were reported with co-morbidities (more than one illness).

**Table 12: Occurrence of illness among 6- to 59-month children (2 weeks prior the survey)**

	Abim	Amudat	Kaabong	Kotido	Moroto	Nakapiripirit	Karamoja
Illness	62.9%	59.7%	82.7%	82.2%	69.3%	70.6%	72.2%

Of those children that reported illness, acute respiratory infections (ARI) was the most frequently reported childhood infection (**Table 13**) followed closely by malaria. No Measles cases were reported. Children with malnutrition combined with acute infectious disease are at a higher risk of mortality than normally nourished children. The risk ratio of mortality from infection increases as the severity of malnutrition increases; mild malnutrition is  $2.5 \pm 0.3$ , moderate malnutrition is  $4.6 \pm 0.9$  and for severe malnutrition  $8.4 \pm 2.1$ <sup>7</sup>. In total 82.9% of all children with moderate or severe malnutrition reported an illness 2 weeks prior to the survey.

<sup>7</sup> Pelletier, D. L., E. A. Frongillo, Jr., et al. (1994). "A methodology for estimating the contribution of malnutrition to child mortality in developing countries." *The Journal of nutrition* 124(10 Suppl): 2106S-2122S.

**Table 13: Diagnosis for children with recorded illness in past 2 weeks**

Illness <sup>8</sup>	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Diarrhoea	39.4%	37.4%	57.0%	48.7%	41.0%	48.1%	46.5%
Malaria	54.3%	59.6%	72.9%	59.5%	60.3%	76.9%	64.2%
ARI	66.3%	50.6%	73.5%	64.4%	76.9%	50.3%	65.0%
Other	1.4%	2.6%	13.7%	2.8%	3.5%	4.5%	5.2%

## 2.2.2 Measles Immunization and Vitamin A Supplementation

Measles vaccination and Vitamin A supplementation remain high in Karamoja indicating the preventative health programs continue to function, this includes Child plus days, where children receive vaccinations, de-worming treatment and supplementation of vitamin A.

**Table 14: Measles Vaccination of children >12 months in Karamoja per district**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
With Card	63.6%	58.3%	28.1%	77.2%	71.8%	58.3%	59.4%
Without Card	32.3%	36.9%	70.1%	21.7%	27.5%	35.2%	37.7%
Total	95.9%	95.2%	98.2%	98.9%	99.3%	93.5%	97.1%

**Table 15: Vitamin A coverage in Karamoja per district**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
With Card	67.4%	59.7%	27.3%	87.2%	63.5%	51.6%	58.2%
Without Card	30.6%	38.1%	71.6%	20.3%	24.3%	42.0%	37.6%
Total	98.0%	97.8%	98.9%	98.2%	87.8%	93.6%	95.8%

## 2.2.3 ITN Possession and use results

Insecticide treated mosquito nets (ITN) ownership varied across, Karamoja, ranging from 90.4% ownership in Abim, to less than 50% ownership in Kaabong and Moroto. The use of (ITNs) has shown to reduce the burden of malaria and associated morbidity and mortality among children. ITNs have also shown to improve the nutritional status of the children<sup>9</sup>. Of the households (892) in Karamoja that reported not having ITN, 61.4% identified that the nets had been destroyed, while 30.7% reported to having never received mosquito nets (**Figure 3**).

**Table 16: ITN Ownership in Karamoja by district**

ITN Ownership (%)	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
No	9.6	26.5	51.7	27.9	51.1	19.4	31.0
Yes	90.4	73.5	48.3	72.1	49.0	80.6	69.0

Of the households owning nets, more than 90% reported that children under 5 years slept under the nets at night, providing protection during sleeping hours. While it has been reported that households are using nets appropriately, on the ground observations show that while households own mosquito

<sup>8</sup> **Case definition:**

**Diarrhoea:** Any episode of more than three loose stools per day; -

**ARI:** Any episode associated with fever and cough and at least one of the following signs: running nose, wheezing, and difficult breathing.

**Malaria:** verified by Fever.

**Measles:** Measles rash (red or reddish brown blotchy appearance), koplik spot (small red spots with blue white centers that appear inside the mouth), cough, runny nose, conjunctivitis (red eyes) and fever

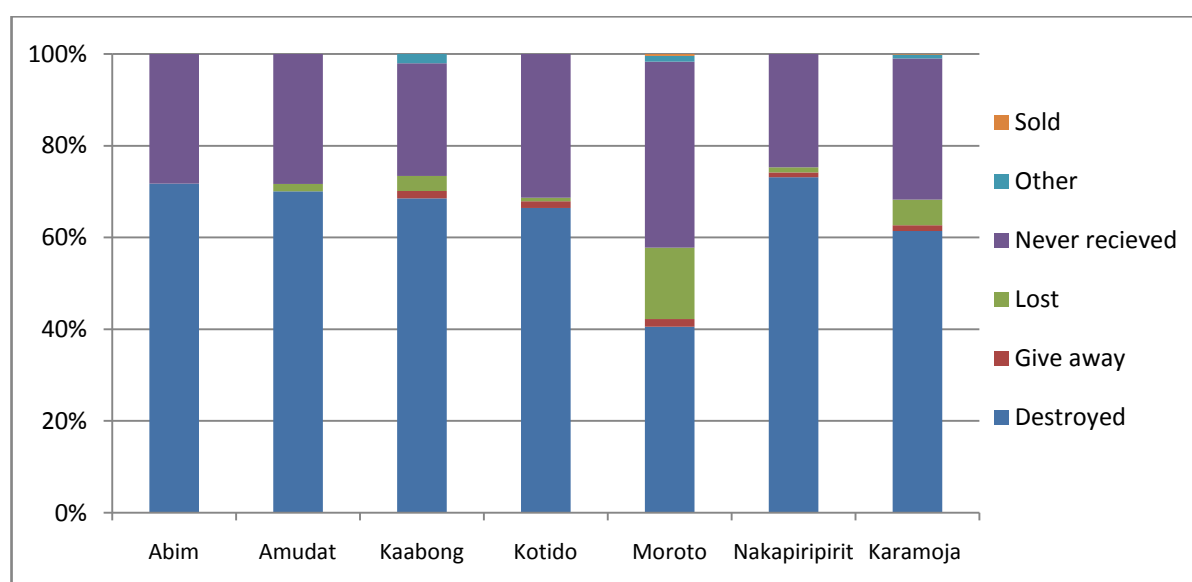
<sup>9</sup> Friedman, J. F., P. A. Phillips-Howard, et al. (2003). "Impact of permethrin-treated bed nets on growth, nutritional status, and body composition of primary school children in western Kenya." *Am J Trop Med Hyg* 68(4 Suppl): 78-85.

nets, correct usage is sometimes limited with nets being used for other purposes other than their intended use. This observation may show that nets may have a multipurpose role during the day and being used correctly at night. These observations warrant further investigation due to the high numbers of children with malaria may require further investigation.

**Table 17: Sleeping arrangements for households reporting ITN ownership in Karamoja by district**

Slept under ITN	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Children < 5 years	95.6%	90.8%	87.0%	100.0%	96.6%	86.5%	92.8%
Children < 5 years	74.0%	83.3%	45.4%	51.4%	24.4%	23.6%	52.8%
Mother	95.4%	89.4%	87.8%	98.3%	94.4%	97.1%	94.1%
Father	70.3%	24.0%	57.1%	27.2%	26.1%	73.0%	48.2%
No-one	0.7%	0.6%	6.7%	0.0%	0.0%	1.6%	1.4%

**Figure 3: Response for non-ownership of ITN in Karamoja by district.**



## 2.3 Childhood Nutrition

### 2.3.1 Child meal

The number of meals<sup>10</sup> eaten by children 6-23 months in the preceding 24 hours was assessed to identify the diversity of food eaten by this age group. Results showed that across the region children mainly consumed two meals/ day, with exception of Abim and Amudat where 53.2% and 67.9% of 6 to 23 month children consumed three meals/day. Moroto/Napak continues to show low meal frequency for children, where a third of children surveyed consume only 1 meal per day. Nakapiripirit improved on the number of meals consumed by children per day, with the majority now having 2 meals per day, while this remains insufficient, it is an improvement from September's results.

<sup>10</sup> A **meal** is an instance of eating, specifically one that takes place at a specific time and includes specifically prepared food (determined by home, culture, time or place), e.g., breakfast/lunch/supper. A meal is a mixture of foods, e.g., carbohydrates, proteins, fats and micronutrients. A snack is one or two food groups, e.g., fruit, boiled egg, milk etc.



**Table 18: Meal frequency among 6 to 23 month children (24 hours recall) per District**

Child meal	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit
0	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%
1	1.6%	0.0%	8.9%	18.3%	33.0%	17.5%
2	28.7%	16.4%	66.4%	51.8%	56.3%	52.4%
3	53.2%	67.9%	21.0%	26.4%	10.3%	29.7%
4 and above	16.5%	15.7%	3.7%	2.8%	0.5%	0.5%

Across the livelihood zones, children from agro-pastoral and pastoral communities mainly consumed two meals per day. Agricultural communities provided a higher frequency of meals to children as per day.

**Table 19: Meal Frequency among 6 to 23 month old children (24 hours recall) per Livelihood Zone**

Child meal	Agricultural	Agro-pastoral	Pastoral
0	0.0%	0.2%	0.2%
1	9.9%	19.2%	13.4%
2	41.7%	52.2%	49.1%
3	39.9%	23.6%	33.0%
4 and above	8.5%	4.8%	4.2%

### 2.3.2 Individual Dietary Diversity Score<sup>11</sup> (IDDS) and Food group consumption by 6-23 months children

The calculation of IDDS for children 6-23 months is based on 6 food groups (Grains/cereals, legume/pulses, Organ meat/meat, eggs, milk and dairy products, Vitamin A rich fruit and vegetables, and other fruit and vegetables).

Karamojong children aged between 6 and 23 months in Karamoja were identified with having a low dietary diversity with the mean number of food groups consumed for the region being 3.0.

Most children in Karamoja have low protein intake from animal sources with only 33.3% of children 6-23 months consuming milk, and fewer children consuming meat and eggs, 17.6% and 0.3%, respectively. The main source of protein (54.1%) came from beans in December 2011. All districts had low IDDS for children 6-23 months, while Kaabong, Kotido and Moroto was identified with having the lowest IDDS score average of 2.7, 2.5 and 2.8 respectively. **Table 20** shows the IDDS scores for each of the districts in December 2011.

**Table 20: IDDS for children age 6-23 months per district in Karamoja, December 2011**

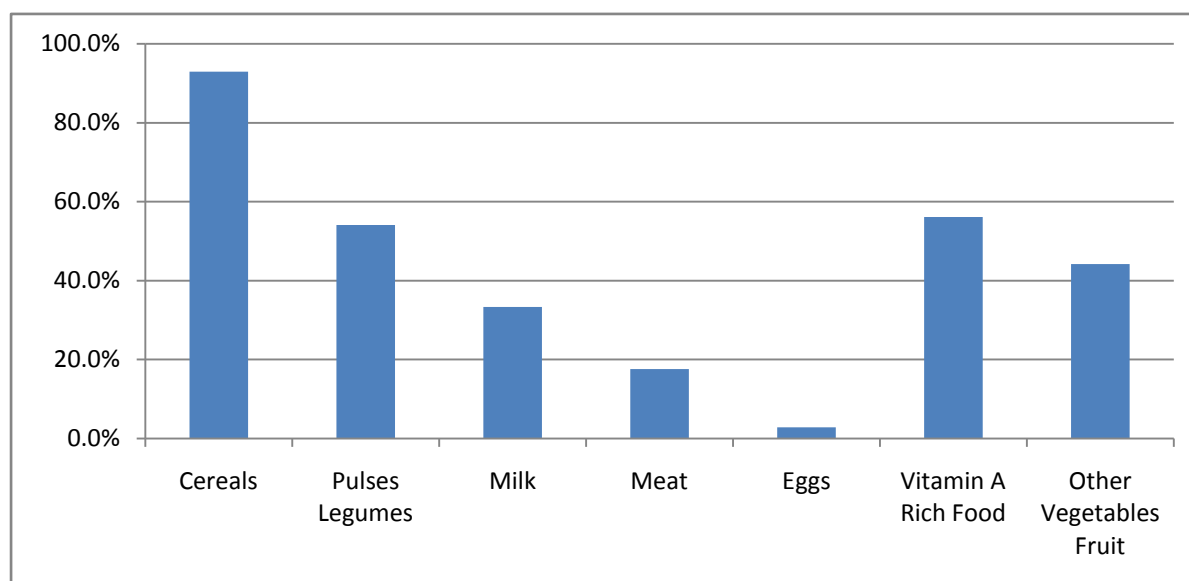
IDDS	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Low ( $\leq 3$ )	59.6	43.4	88.8	90.9	77.2	55.7	71.8
Adequate	40.4	56.6	11.2	9.2	22.8	44.3	28.2
IDDS Mean	3.3	3.8	2.7	2.5	2.8	3.2	3.0

Children 6-23 months were mainly feed on foods from cereal origin; with 92.9 % of children consuming grain products in the past 24 hours.

The graph (**Figure 3**) below gives a visual representation of the foods consumed throughout Karamoja in December 2011.

<sup>11</sup> **Individual Dietary Diversity Score** - the number of different food groups consumed over a 24 hours period for Karamoja Surveillance.

**Figure 4: Foods consumed by children 6-23 months in the previous 24 hours**



### 2.3.3 Exclusive breast feeding

The proportion of children less than 6 months being exclusively breastfed in Karamoja was 56.0%. This result remains relatively stable when compared to previous results. Levels of breastfeeding in Kaabong and Nakapiripirit continue being low when compared to other districts.

**Table 21: Feeding practices for children less than 6 months per District in Karamoja**

Exclusive breast feeding	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit
Bottled milk	1.8%	1.3%	0.0%	0.0%	0.0%	0.0%
Breast milk and other	32.5%	22.4%	42.2%	26.9%	46.3%	53.1%
Breast milk only	65.8%	76.3%	26.6%	73.1%	50.8%	42.9%
Other foods only	0.0%	0.0%	31.3%	0.0%	3.0%	4.1%

### 2.3.4 Appropriate Child feeding

To better understand whether children are being feed appropriately in Karamoja, calculations using a combination of dietary diversity and child meals is used. The resulting calculation shows per district the proportion of children age 6 to 23 months who are receiving an acceptable diet according to UNICEF guidelines. In all districts it is identified that a large percentage of children are not receiving what is considered to be an acceptable diet for this age group.

**Table 22: Minimum Acceptable Diet in children 6-23 months**

	Abim	Amudat	Kaabong	Kotido	Moroto Napak	Nakapiripirit	Karamoja
Unacceptable diet	71.5%	63.8%	92.5%	94.0%	88.4%	77.6%	83.0%
Acceptable diet	28.5%	36.2%	7.5%	6.0%	11.6%	22.4%	17.0%

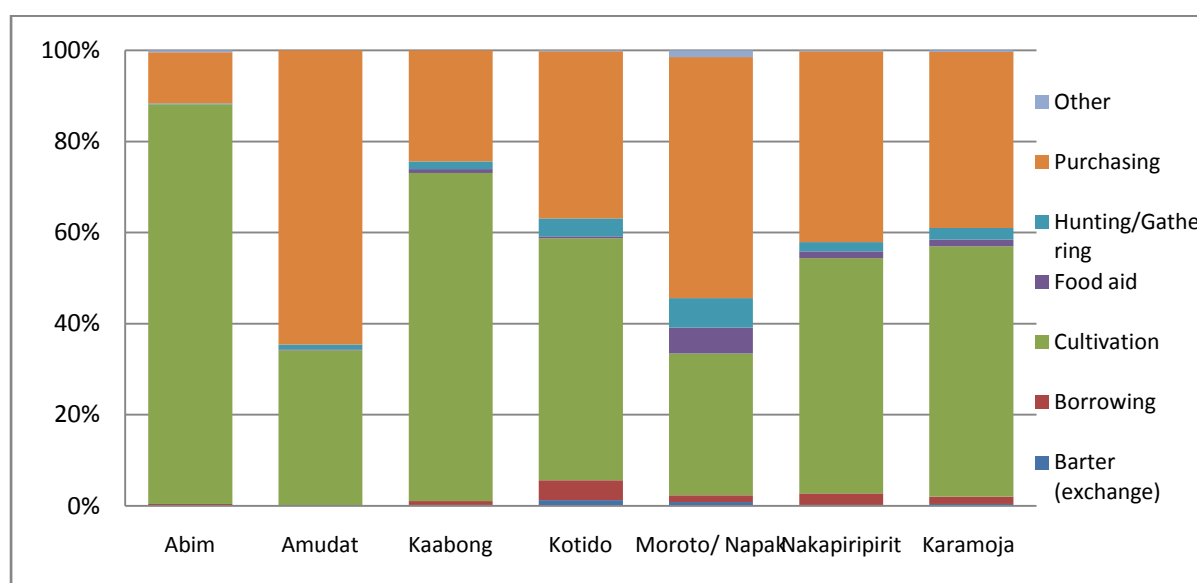


## 2.4 Food Security Indicators

### 2.4.1 Main Food source

Cultivation was the highest reported '*main food source*' throughout the region in December 2011 (55.0%), followed by purchasing which contributed (38.6%) while food aid contributing 1.4% in the surveyed population, hunting/gathering was at 2.6%. Moroto early after the harvest season in the district is already showing high numbers of households purchasing food, which may identify harvested food crops were initially lower than expected due to heavy flooding rains or crop disease resulting in lower yields than expected.

**Figure 5: Main Source of Food for households per district (%)**

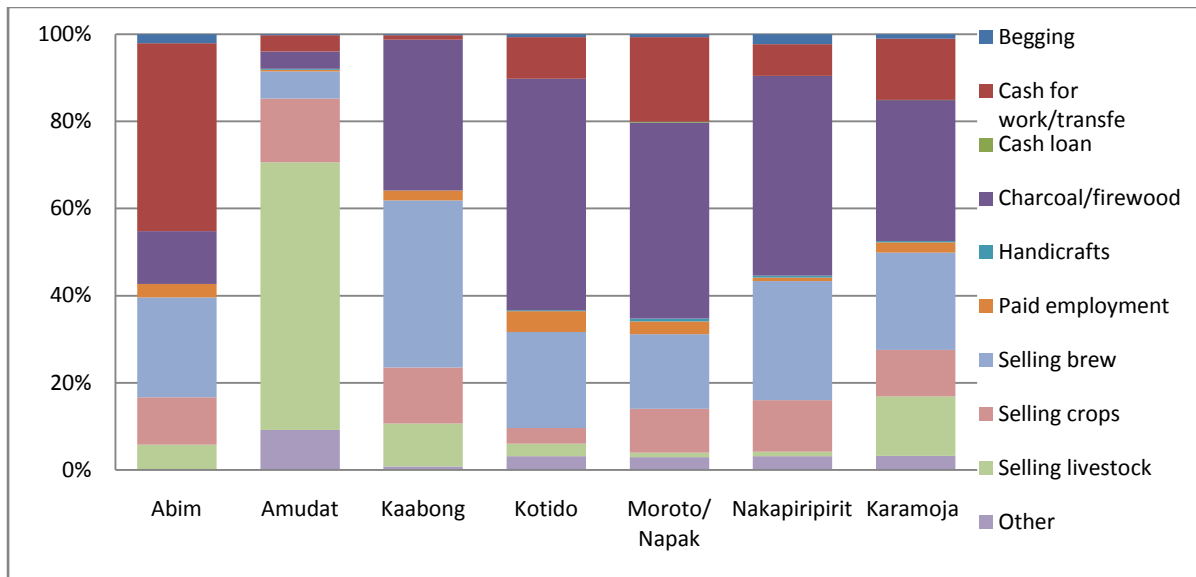


### 2.4.2 Current Household income source and expenditure

In December 2011, the main source of income for the Karamoja region came from Charcoal and firewood production and selling (32.4%), with the selling of kwete being the second main source of income (22.3%) for carers of children. The sale of kwete was the main source of income in Kaabong district and was the second most common source of income in Abim, Kotido and Nakapiripirit.

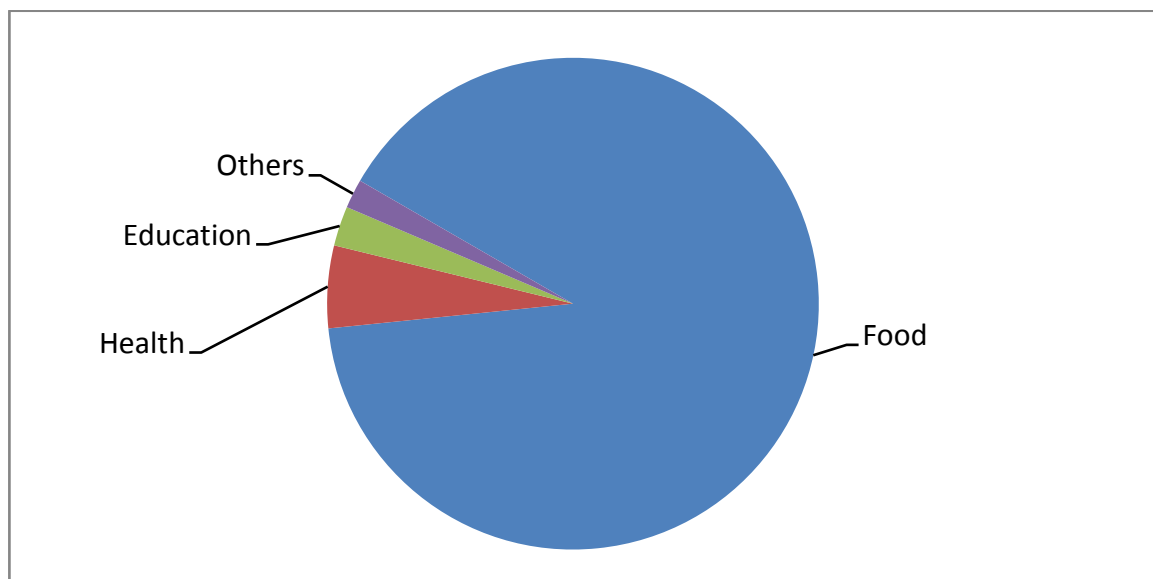
This varied from the September round of surveillance where most households were accessing income through food aid-cash for work programs (37.3%) and selling of kwete was at 9.1% of the households surveyed.

**Figure 6: Main source of Household Income per District – December 2011**



The majority of income at the household level in Karamoja is spent on food (90.1%) in the region; (90.6%), Kotido (94.2%), Abim (81.7%), Moroto (92.7%), Amudat (98.3%) and Nakapiripirit (82.9%). Health and Education took a percentage of 5.4% and 2.6% in the whole region.

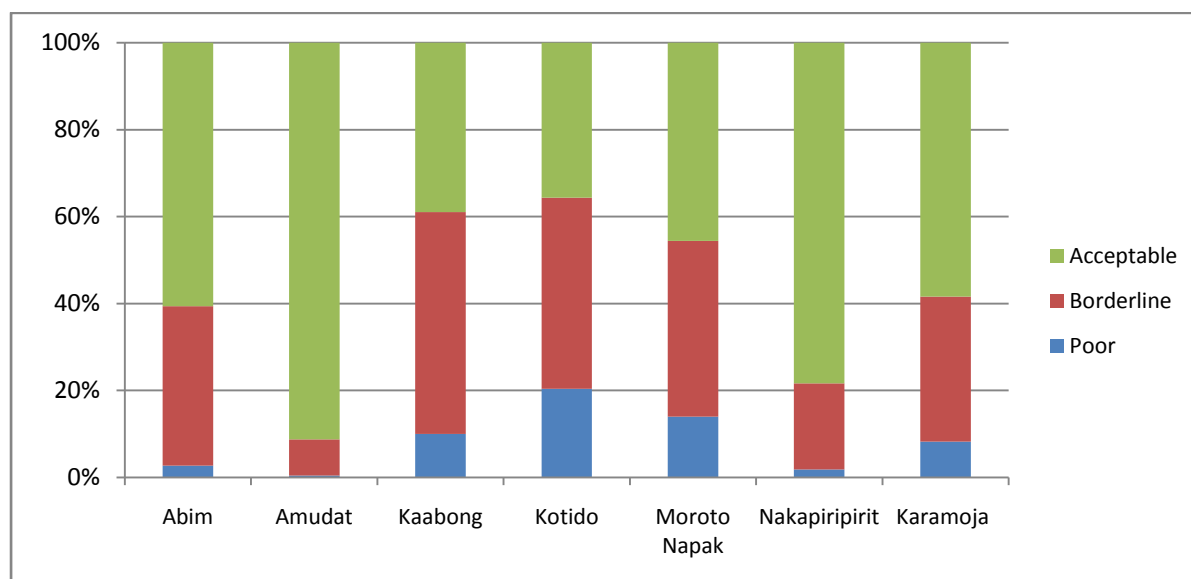
**Figure 7: Main Household Expenditure per district – December 2011**



### 2.4.3 Household Food Consumption Score<sup>12</sup> (FCS)

Household food consumption scores continued to improve into December 2011, with significant decreases in the proportion poor FCS households from 15.5% to 8.2% while the proportion of acceptable FCS households increased from 52.3% to 58.4% ( $p < 0.001$ ).

**Figure 8: Food Consumption Score per Districts in Karamoja**



Increases in the mean FCS were identified in Amudat, Kotido and Nakapiripirit. While there was an increase in the mean FCS for Kotido district it remains below the borderline threshold, identifying that the household food consumption remains a concern in this district. Decreases were identified in Kaabong and Moroto/Napak with the mean FCS dropping below the borderline threshold indicating continuing concerns for the food consumption at the household level. Abim mean FCS remained relatively stable.

**Table 23: Mean Food Consumption Score by District**

	Abim (95% CI)	Amudat (95% CI)	Kaabong (95% CI)	Kotido (95% CI)	Moroto Napak (95% CI)	Nakapiripirit (95% CI)
<b>Dec-11</b>	<b>41.0</b> (39.9-42.2)	<b>56.7</b> (55.4-58.0)	<b>33.2</b> (32.4-34.1)	<b>33.5</b> (32.2-34.8)	<b>34.5</b> (33.4-35.6)	<b>50.8</b> (49.0-52.5)
<b>Sep-11</b>	<b>39.6</b> (38.4-40.7)	<b>31.2</b> (29.8-32.5)	<b>44.0</b> (42.6-45.4)	<b>30.7</b> (29.4-32.0)	<b>44.2</b> (42.8-45.6)	<b>36.7</b> (35.4-37.9)

Using weighted analysis to enable comparisons between each livelihood zone the mean FCS was above the acceptable threshold in Karamoja. While this presents the mean for the livelihood zones, proportions of households in these zones continue to be vulnerable or are food insecure.

All livelihood zones showed an improvement in the proportional of households classified as poor from September 2011. Pastoralist households had the greatest improvement reporting only 8.7% of poor households as compared to 23.4% in September (**Figure 8**).

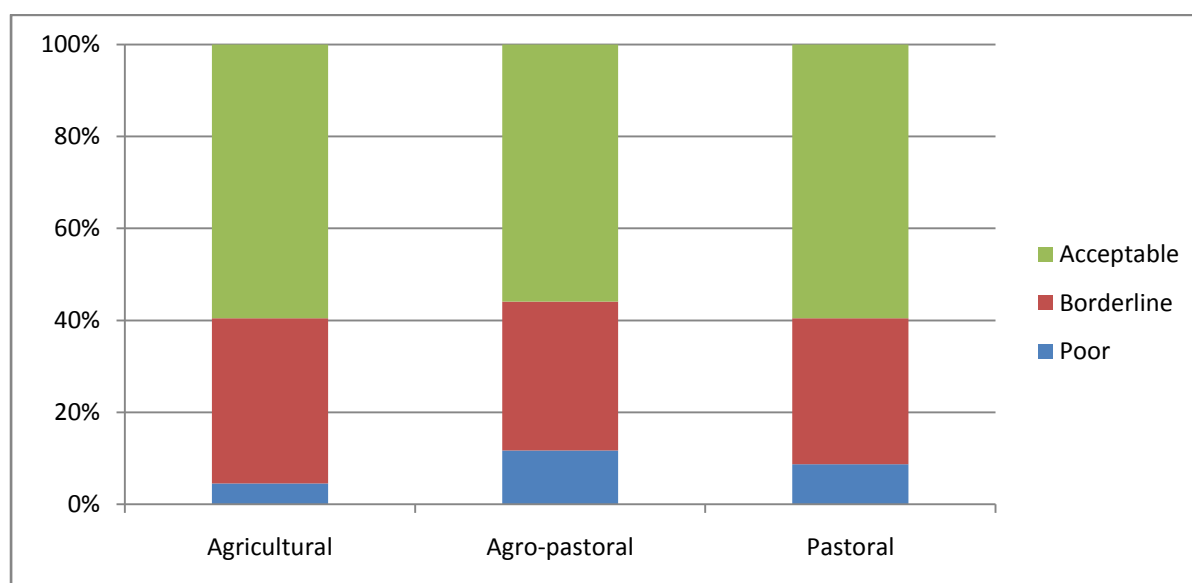
There was an increase in the mean FCS for pastoralist households between September 2011 and December 2011 from 34.0 to 41.6, respectively ( $p < 0.001$ ). Agro-pastorals also reported a increase in the mean FCS of households during the same period ( $p < 0.001$ ), while agriculturalist continued with a similar mean FCS.

<sup>12</sup> **FCS**: Proxy indicator that represents the dietary diversity, energy and macro and micro (content) value of the food that people eat. Based on the calculation of food types and food frequency over a seven-day period.

**Table 24: Mean Food Consumption Score by Livelihood Zone**

Surveillance Round	Agricultural (95% CI)	Agro-pastoral (95% CI)	Pastoral (95% CI)
<b>Dec-11</b>	<b>42.1</b> (41.1-43.1)	<b>41.1</b> (39.9-42.2)	<b>41.6</b> (40.6-42.7)
<b>Sep-11</b>	<b>41.2</b> (40.3-42.1)	<b>38.1</b> (37.0-39.1)	<b>34.0</b> (33.1-35.0)

**Figure 9: Food Consumption score for Livelihood Zones in Karamoja, December 2011**



#### 2.4.4 Household Dietary Diversity Score<sup>13</sup> (HDDS)

Similar to September 2011, all the six districts had their mean HDDS falling within the medium classification. Amudat continued having the highest mean HDDS (5.5). Moroto improved the dietary diversity at the household level increasing from 3.4 to 4.4, although this is an improvement it continues to within the medium threshold.

**Table 25: Household Diet Diversity Score per district**

HDDS	Abim	Amudat	Kaabong	Kotido	Moroto/Napak	Nakapiripirit	Karamoja
Low ( $\leq 3$ )	6.0	1.9	29.4	33.3	34.5	16.0	20.2
Medium	61.5	49.2	63.8	58.1	39.3	42.1	52.3
High ( $\geq 6$ )	32.5	49.0	6.9	8.5	26.2	41.9	27.5
HDDS mean	5.0	5.5	4.0	4.0	4.4	5.2	4.7

Agriculturalists fared much better in December with dietary diversity with more than 30% of households consuming six or more types of food overall and had the lowest proportion of households consuming 3 or less. This is a reverse of household dietary diversity since May where Agriculturalist generally fared worse than the other two livelihoods in the diversity of food consumed. This may be related to the timing of the survey, where harvesting has been completed providing agriculturalists with cash to purchase other foods.

<sup>13</sup> **Dietary Diversity:** - the number of different food groups consumed over a given, 24 hours for Karamoja Surveillance

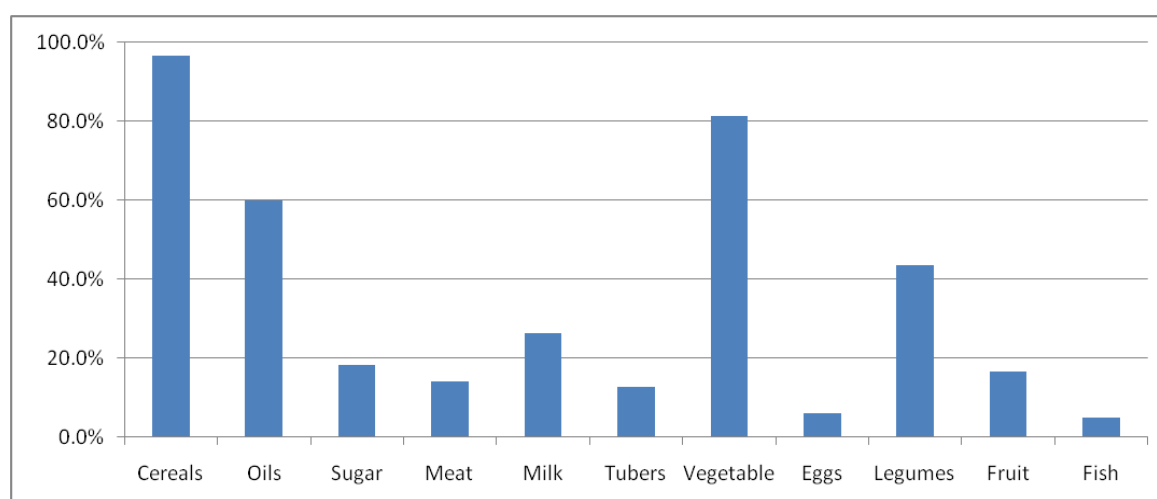
**Table 26: Household Dietary Diversity per Livelihood Zone**

	Agricultural	Agro-pastoral	Pastoral
Low ( $\leq 3$ )	15.7	22.9	22.1
Medium	52.5	48.0	56.1
High ( $\geq 6$ )	31.8	29.1	21.8
HDDS mean	4.9	4.7	4.4

## 2.4.5 Household consumed foods according to HDDS

The consumption of staple foods across the region continued to be high with 96.5% of households reporting to have consumed cereals using a 24 hour recall. Since September 2011, there was an increase in the proportion of households that were able to eat vegetable proteins, generally in the form of beans. In December 43.6% of households reported eating beans as compared to 35.1% in September. The consumption of other high protein foods of milk, eggs and meat remained relatively stable, but low as compared to September 2011.

**Figure 10: Foods consumed by Households in previous 24 hours**

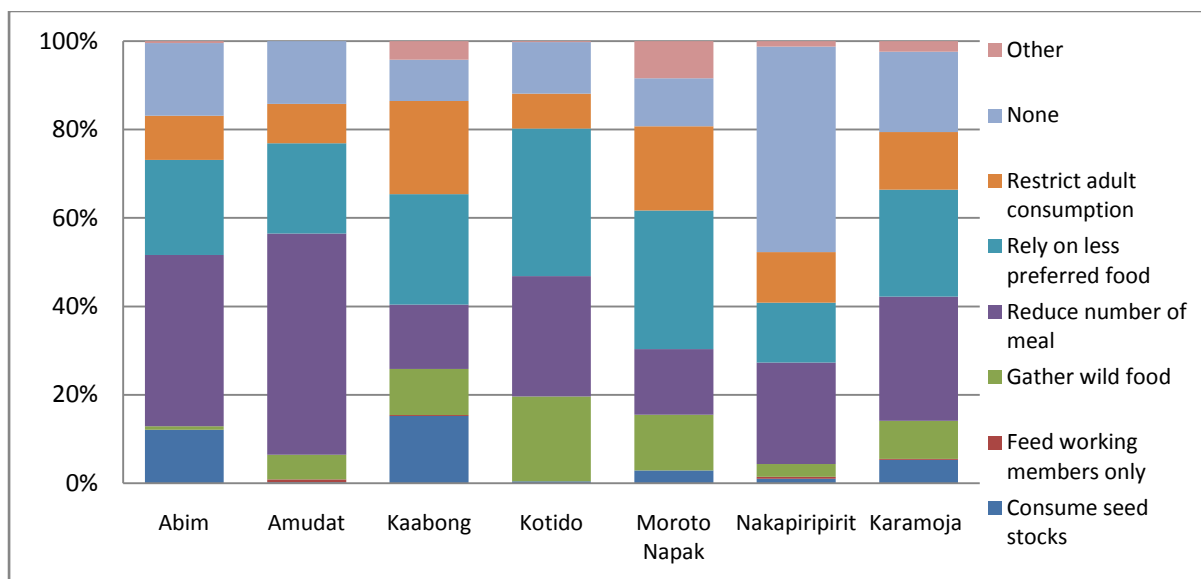


## 2.4.6 Coping mechanism

People in Karamoja adopted various coping mechanisms to adapt to food shortages at the household level.

Patterns of coping mechanisms followed previous surveys, identifying that the reduction of the number of meals was the main coping mechanism (28.1%), followed by eating less preferred foods (24.2%). Nakapiripirit, showed the greatest number of households (46.5%) who did not use any coping methods tabled, this is an increase from 33.6% of households in September 2011. Kaabong had a reduction in the households who did not use any coping methods from 36.5% in September to 9.4% in December. There was an overall reliance of households hunting and gathering wild foods, such as rats within harvested crop fields in Kotido and Moroto.

**Figure 11: Coping Mechanisms employed by Households per District in Karamoja**

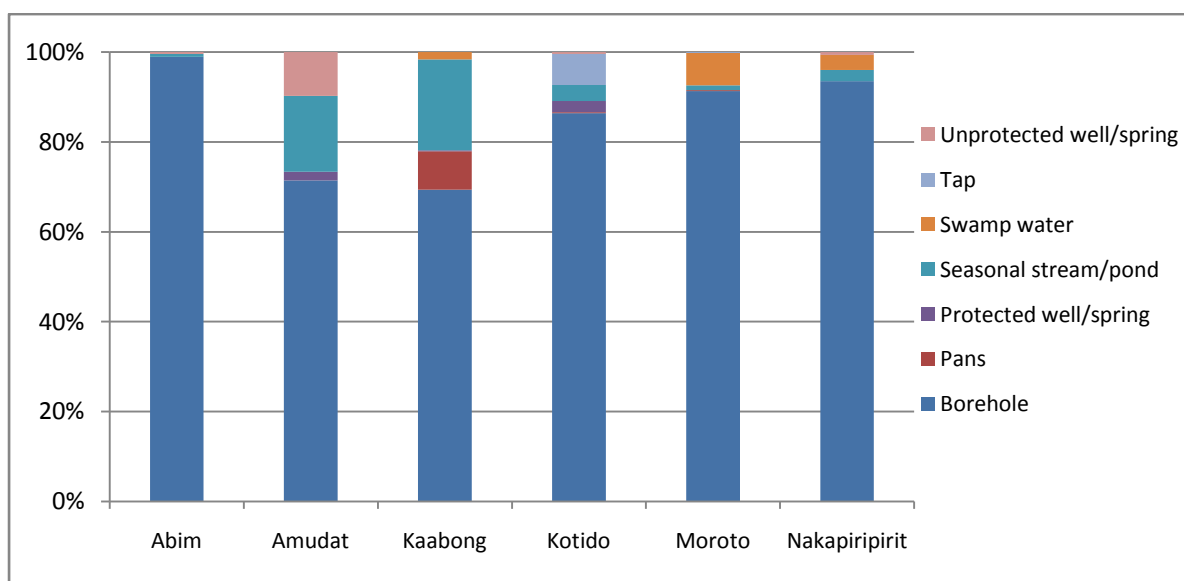


## 2.5 Water, Sanitation and Hygiene (WASH) Indicators

### 2.5.1 Primary water sources

The common water sources used in Karamoja region include; borehole, seasonal streams/ponds, and taps. Boreholes remain the main sources of water for the house hold ranging from 75.8% in Kaabong to 95.6% Abim. Due to the continuing rains in December 17.9% of households in Amudat were accessing water from seasons pond or streams, Kaabong also showed that 12.1% of households access water from similar sites. The December survey identified that the proportion of households in Kaabong who were accessing water from unsafe water sources decreased from September 2011, the proportion of households in Nakapiripirit, Moroto Kaabong increased.

**Figure 12: Main Water Source per District in Karamoja**

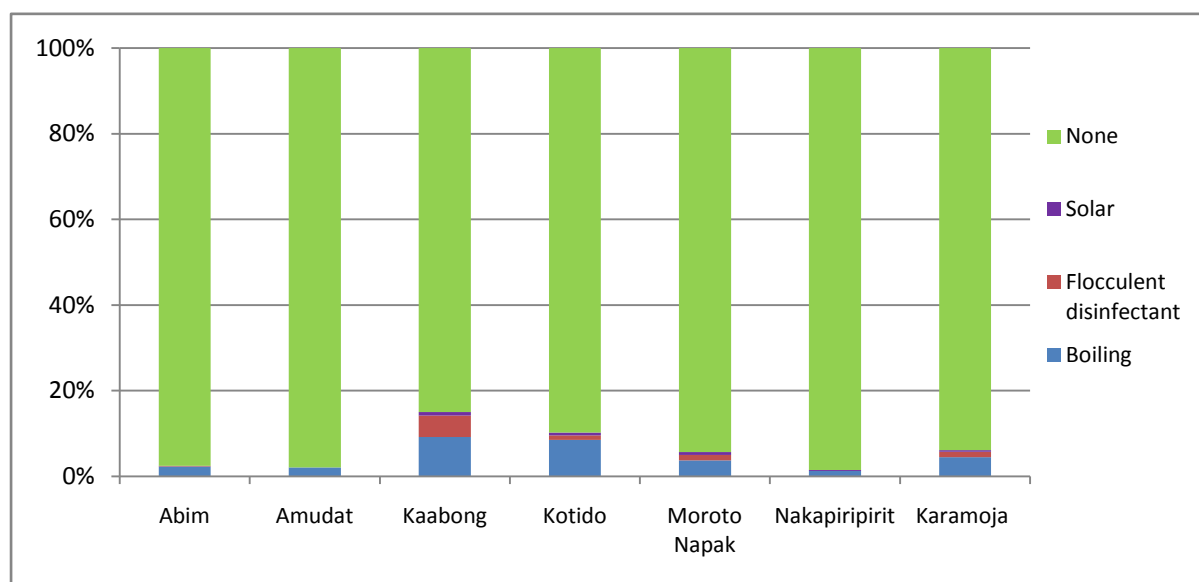




## 2.5.2 Water treatment

Most households across the region, do not use any water treatment methods (93.9%), some of water treatment like boiling, solar and use of disinfectants were registered across the region. Kaabong reported the highest treatment of water across the districts (15.0%)

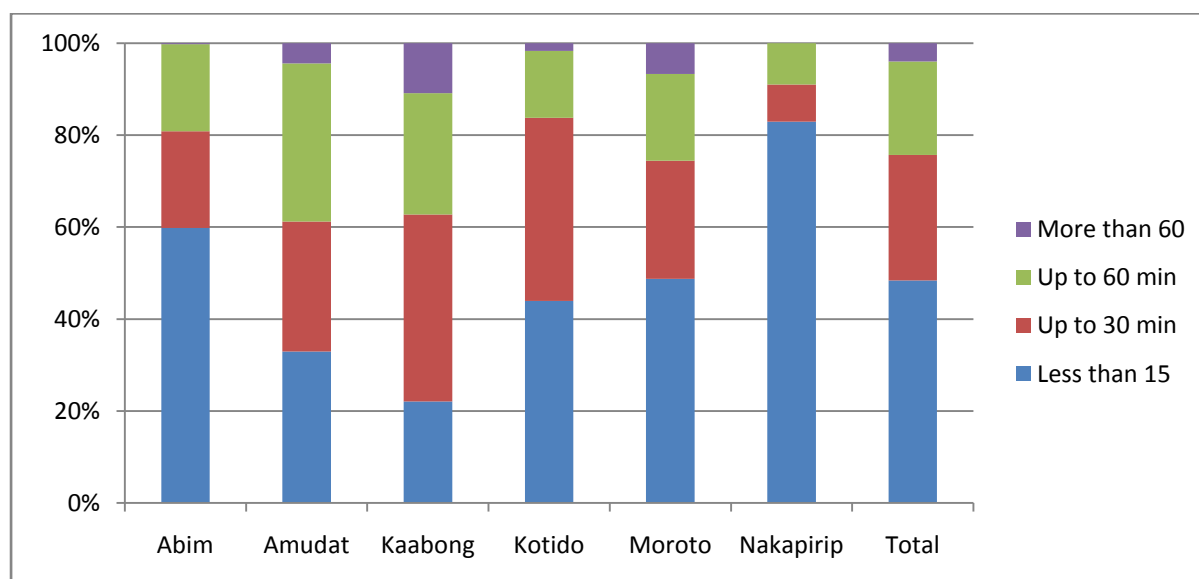
**Figure 13: Water Treatment per District in Karamoja**



## 2.5.3 Time to water source

Physical distance (or duration walking) to a water source is one of the determinant factors to water access and can be linked to child care behaviors. Household respondents' were asked the time they take to walk from their home to main water point. Almost half the households in the district are within 15 minutes walk to a water point to collect water. From the responses, Kaabong is the main exception with households on average needing to walk 32 minutes to access water.

**Figure 14: Time taken to fetch water per District in Karamoja (minutes)**

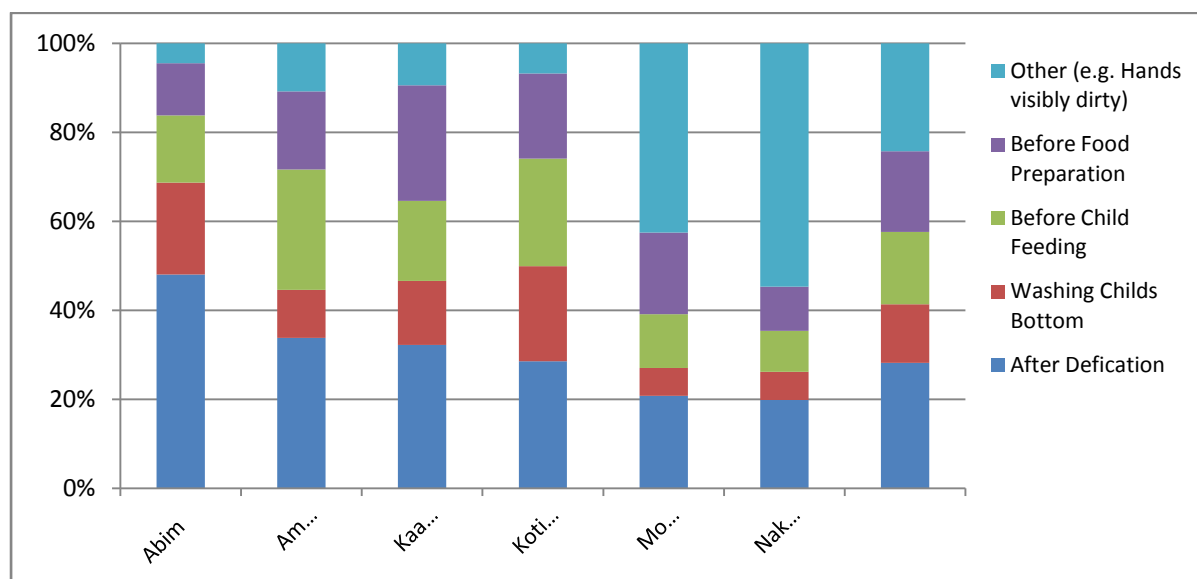


## 2.5.4 Hand Washing Practice

Hand washing practices for Karamoja remain relatively unchanged. Households mainly wash their hands with water only (73.8%), this practice remains similar to previous reported results. Kaabong reported the highest use of soap (41.0%).

Moroto/ Napak and Nakapiripirit are identified as the two districts that practice washing their hands at critical junctures during the day, washing their hands mainly when they are visibly dirty. **Figure 14** shows the proportion of households who employ hand washing at the recommended times.

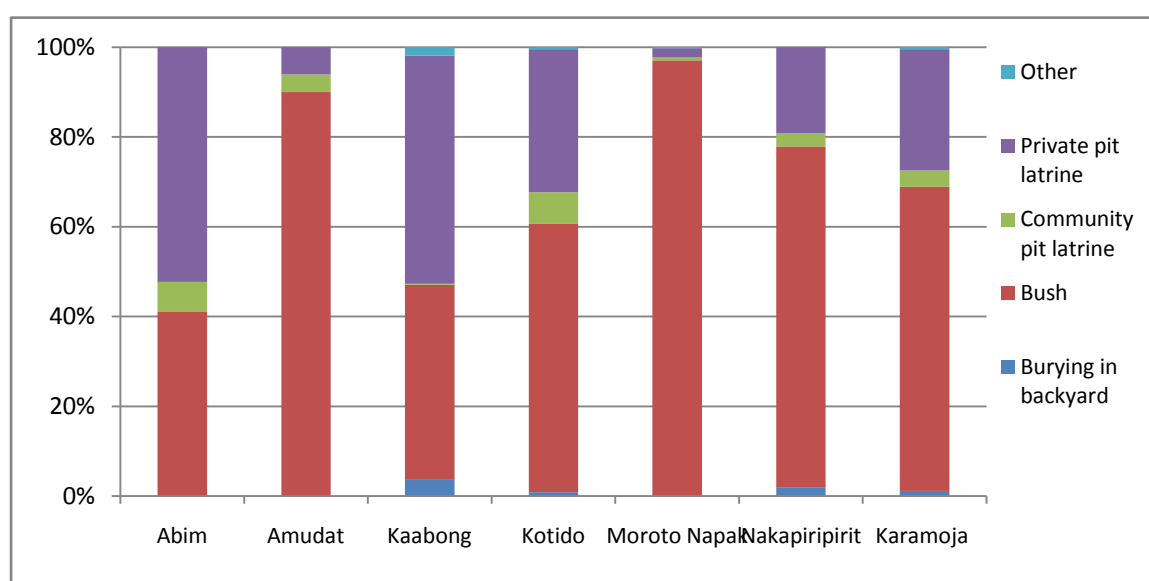
**Figure 15: Hand washing at critical junctures per District in Karamoja**



## 2.5.5 Human waste disposal

Most of the households continue to use the bush as their means of human waste disposal across the districts (67.8%). Abim and Kaabong continue to show the highest use of private pit latrines with more than 50% of households having access to their own latrine.

**Figure 16: Human waste Disposal per district in Karamoja, September 2011**





### 3 Conclusions

#### 3.1 Nutrition and Health

The prevalence of global acute malnutrition across the region continued to decrease since May 2011, with an overall GAM of 8.1% (6.9-9.5 95% CI). While there is improvement across the region, Moroto continues to have prevalence rates > 10% GAM, which continues to be concerning. In December there was a 2 fold decrease in the numbers of children admitted in therapeutic feeding throughout the district, yet the real numbers of malnourished children continue to be high. The decrease in admission numbers could be attributed to the time of the year, where communities focus on harvesting and festivities. Similar decreases are seen in admission numbers in December 2010.

In real numbers by district using population figures, (children 20% of population) and prevalence rates, the numbers of children with acute undernutrition, could be calculated as high as; Abim -1411, Amudat – 1468, Kaabong – 4480, Kotido – 2322, Moroto – 7020 and Nakapiripirit – 3240. For Karamoja in December 2011, the total number of children who could be facing acute malnutrition could be more than 19,000.

##### 3.1.1 Malnutrition and Illness

The health of children and their exposure to acute illness continues to be of major concern considering the high numbers of children reporting illness. Childhood diarrhoea and malnutrition as reported earlier have a moderate correlation to the weight of a child ( $p < 0.001$ ). The strength of this relationship varied between districts and no such relationship existed in Amudat. In December 2011, no such relationship could be identified between malaria or ARI at the regional or district level ( $p > 0.05$ ).

Regression analysis for all seven rounds identifies that there is a relationship between illness and a child's weight-for-height z-score, most significantly, diarrhoea during the lean period of May 2010 and May 2011 ( $p < 0.001$ ), there was also a moderate relationship with a child's weight for height z-score and diarrhoea in December 2010, which saw the third highest rate of overall GAM for the surveillance rounds ( $p < 0.001$ ). The strength of the relationship decreases during other periods of the year, where we also see the rates of GAM decrease/improve.

Malaria and ARI although showing some moderate correlations within districts remains inconsistent across the seven rounds of surveillance.

It should be noted that these correlations identified between illness and WH z-scores does not indicate that illness as a causal factor of malnutrition in Karamoja but identifies a relationship between them.

#### 3.2 Food Security

In December the overall household food security continued to improve for Karamoja, with fewer households reporting to be food insecure. Cultivation as in September continued to contribute as the main source of food for households in Karamoja, except in Moroto where households had already started to identify purchasing as their main source of food (52.9%), similar to patterns seen in the lean season (May).

The numbers of households reporting household income from cash transfers/cash for work decreased in December with the production of firewood or charcoal increasing. The selling of brew as the main source of income almost doubled in Karamoja from 11.5% in September to 22.3% in December. This was especially pronounced in Kaabong where kwete production was the main source of income for 38.3% of households. This increase in the production and sale of kwete coincides with the harvest of staple crops, yet further investigation is needed to understand if the harvesting of crops directly influences the production and sale of kwete. Analysis of the rate of GAM for households that identify the production and selling of kwete as the main source of income is the lowest at 7.3%.

Using regression analysis comparing the household food consumption score and weight-for-height, no relationship between food security and malnutrition could be identified in Karamoja in December ( $p > 0.05$ ).



Cereal Consumption remained high in the region (96.5%) in December 2011. Consumption of high nutritional value foods still remain low in the region; meat (13.9%), eggs (16.0%) at the regional level. Milk consumption in agro-pastoralist and pastoralist households was relatively equal at 31.5% and 32.6% respectively ( $p>0.05$ ). This contrasted significantly to agriculturalist households where only 14.8% of households consumed milk in a prior 24 house period. Even so milk was only consumed on an average of 2 days in agro-pastoralist and pastoralist households and only consumed 1 day a week in agriculturalist households.

Meat consumption was relatively equal across all districts; with most district consuming meat only once a day, the exceptions was Nakapiripirit where meat was consume 2 days in the week.

In general, districts with better mean food consumption scores (Abim and Amudat) consumed oil more frequently than other districts. Abim consumed beans more regularly (4.5 days) than other districts, whose remain mean consumption of beans was only 2.5 days from 7. Contributing to the high mean FCS of Amudat was the frequent consumption of milk (5.5days) within households. Abim and Amudat continue to have relatively low rates of GAM as compared to other districts, the higher consumption of oil and milk and high protein vegetable sources may contribute to this.

Throughout Karamoja 83.0% of the children 6-23 months of age have unacceptable diets ranging from 63.8% in Amudat to 94.0% in Kotido. It remains difficult to identify whether unacceptable childhood diets and acute malnutrition have some relationship in Karamoja. This requires deeper investigation.

### 3.3 Water, Sanitation and Hygiene (WASH)

The main source of drinking water was a borehole in all districts ranging from 73.8% to 95.6% in Abim. In Amudat where 17.9% of households were accessing water from seasonal streams and ponds because of continuing rain Overall 12.6% of households were collecting and consuming water from what is considered unsafe water sources which reflects the results from September 2011 (12.9%) and May 2011 (14.7%) While there is a presumption that water taken from boreholes is potable, water transport and storage mechanisms at the household may be a source of contamination of water as most of many of the containers used for water storage have dual/many uses within the house. The household water storage practices may have an impact on water borne diseases such as diarrhea.

Physical distance (or duration walking) to a water source is one of the determining factors of water access. In December 2011, the average time taken to walk to the water point to collect water was 20 minutes. Kaabong and Moroto were identified as having the greatest time to collect water with 32 and 27 minutes to reach water, respectively. Nakapiripirit had the shortest time to collect water with average water access within 8 minutes of the household. The distances traveled and time taken to transport water also impacts on water quality at the household.

Unsanitary human waste disposal increases the risk of cross infection and disease. On average 67.8% of households continue to use the bush in Karamoja to defecate. Exceptions to this are households in Abim and Kaabong who report over 50% of households have private latrines.

Hand washing practices with soap at critical junctures are generally low across the region. This also may contribute to the high rates of diarrheal disease in Karamoja.

### 3.4 District key findings

- **Abim:** Abim overall remains relatively stable between September and December. There was no significant change in the rates of GAM in Abim from September 2011 to December 2011 ( $p>0.05$ ), yet continue to remain within the poor threshold according to WHO, High numbers of children continue to report illness 2 weeks prior to the surveillance round (62.9%) There was a slight decrease in the proportion of households with acceptable food consumptions scores from 75.7% to 60.6% between September and December. This reduction in household FCS appears not to have impacted on the rates of GAM in the district.
- **Amudat:** GAM decreased from 9.2% in September 2011 to 7.0% in December 2011. The mean household FCS increased to 56.7, giving 91.3% of households an acceptable FCS. Amudat had the lowest reported illness for children 6-59 months in the region (59.7%). ITN ownership continues to be stable at 73.5%. The purchasing of food is the main source of food, with the selling of livestock being the main source of income for households (61.5%)



- **Kaabong:** The prevalence of GAM is stable for this time of the year at 8.4%, with no significant difference from September results (8.6%). The mean household FCS is borderline, with 61.0% of household's borderline or below. A slight relationship between acute respiratory disease and diarrhoea and children's weight-for-height was identified ( $p<0.05$ ). The production and sale of kwete has increased to be the main source of income for households.
- **Kotido:** The GAM levels continue to be stable at 6.8% which is similar to September at 6.7%. The mean household FCS score in December was borderline, with only 35.6% of households being food secure, although this was not reflected in the rates of GAM for the district. Children had high rates of illness in the district, a moderate relationship between diarrhoea and the weight for height was identified ( $p<0.001$ ),
- **Moroto:** Moroto and Napak continue to have serious levels of acute malnutrition in children 6-59 months (10.9%). The mean household food consumption score was below the acceptable threshold, yet over 45% of households surveyed were identified as food secure. Relationships between diarrhoea and weight-for-height were identified ( $p<0.001$ ). Households are already identifying purchasing as their main source of food in the district, even though harvesting was recently completed or ongoing. The possibility of flooding rains prior to harvest have impacted on harvest levels in Moroto.
- **Nakapiripirit:** The prevalence of GAM in Nakapiripirit continue to decrease from critical levels ( $>15\%$ ) in May 2011 to poor (5-9.9%) in December. Levels of household food security also continue to improve for the district, with the second highest household mean FCS (50.8) in Karamoja. Cultivations continue to be the main source of food, with the sale of charcoal and firewood being the main source of income for the district. Nakapiripirit continues to show a relationship with diarrhoea and children's weight-for-height. Malaria was the highest reported illness for children.

#### 4 Recommendations

1. Unacceptable rates of appropriate child feeding calls for messages disseminating IYCF practices at all levels, including health centres, village, and Manyatta levels.
2. The importance of strengthening programs that focus on household diet to ensure that children receive both macro and micro nutrients regularly.
3. Strengthen active case finding in the community so as to identify the cases of malnutrition early and prevent severe malnutrition by enrolling children in supplementary feeding programs.
4. Strengthening IMCI protocols in the treatment of acute illnesses, especially diarrhoea and the correct use of ORS and ReSoMal within Karamoja to try to reduce the prevalence of malnutrition associated with diarrhoea.
5. Hygiene messages surrounding hand washing needs to be continued to increase the numbers of people practicing good hygiene to prevent illness and cross infection.
6. High rates of malaria in Karamoja identify a continuing need to repackage key messages, targeting women and children, for the communities on how to use and retreat ITN. While ownership has increased, there is a general lack of understanding on the correct use of ITN throughout Karamoja, with incorrect usage and care possibly contributing to breakages and the destruction of nets.
7. Education on the correct storage and treatment of water should be implemented at the household level in order to reduce high levels of water borne disease as well as a reduction in the breeding of mosquitoes.