



**Nutrition Surveillance  
Karamoja Region,  
Uganda  
Round 6, September 2011  
Annexes**

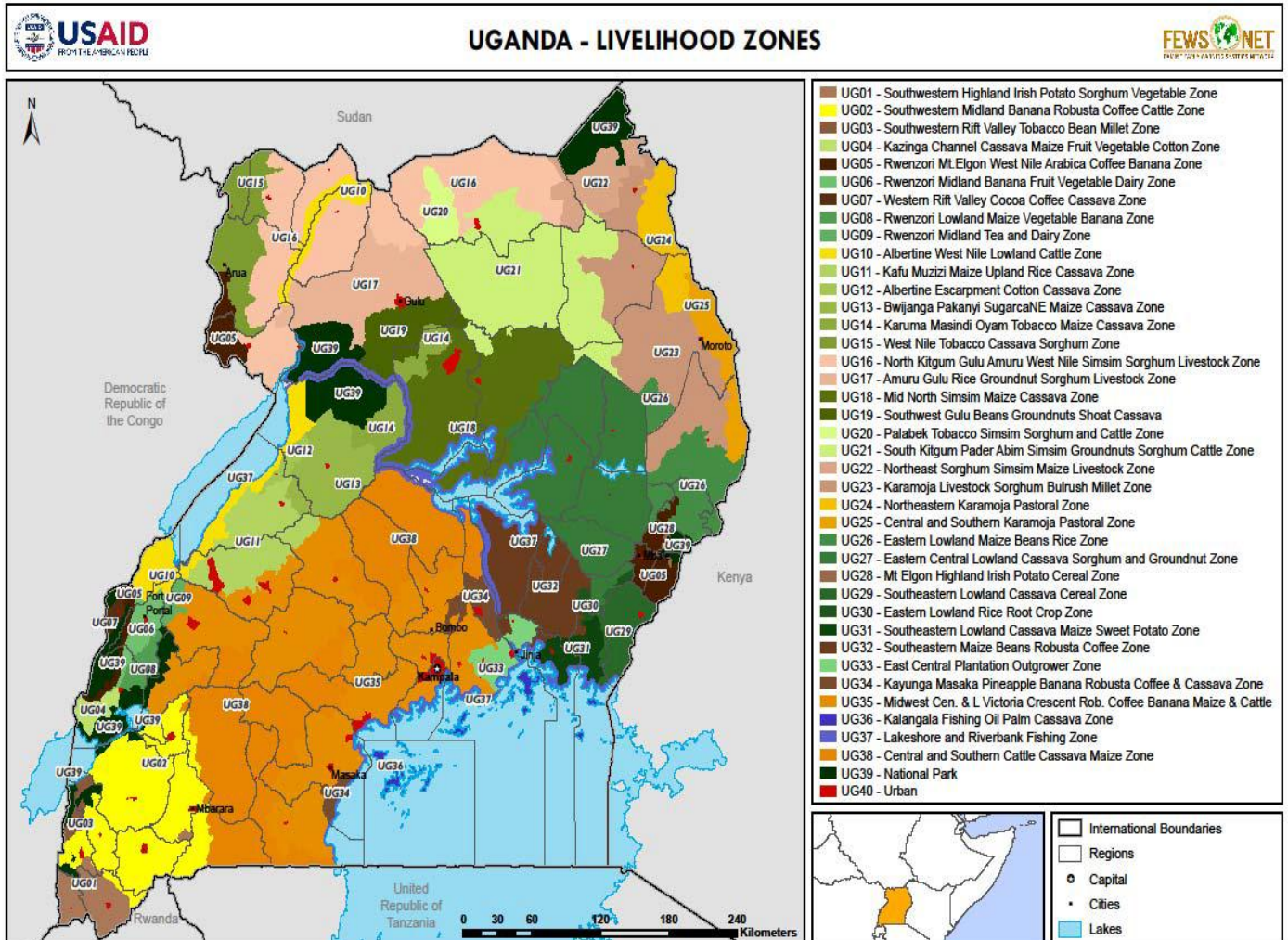


**Annex 1: Map of Karamoja**





## Annex 2: Livelihood Zone Map of Uganda





## Annex 3: Detailed methodology implemented

### Methodology:

Household was the sampling unit and the sample size was 480 for each of the 6 districts.

A multi-stage cluster sampling method was used to select 300 households per district (25 clusters x 12 households design).

The 30 clusters per district were distributed proportionally to the population size (PPS) of each livelihood zone (LHZ) that the district contains. For example, Kaabong district comprises of 3 LHZs and using PPS, these LHZs were assigned 8, 6, and 11 clusters respectively.

**Table 1: Population per district per LHZ**

	Population figures			
	Agricultural	Agropastoral	Pastoral	Total
Kaabong	82,843	48,187	135,677	266,707
Kotido	0	45,041	125,697	170,738
Abim	111,989	0	0	111,989
Moroto	57,312	224,341	40,404	322,057
Amudat	0	45,602	59,257	104,859
Nakapiripirit	101,127	35,774	39,213	176,114
<b>Total</b>	<b>353,271</b>	<b>398,945</b>	<b>400,248</b>	<b>1,152,464</b>

**Table 2: Clusters per district per LHZ**

	Clusters per district/LHZ PPS			
	Agricultural	Agro-pastoral	Pastoral	Total
Kaabong	9	8	13	30
Kotido	0	8	22	30
Abim	30	0	0	30
Moroto	5	21	4	30
Amudat	0	13	17	30
Nakapiripirit	17	6	7	30
<b>Total</b>	<b>61</b>	<b>56</b>	<b>63</b>	<b>180</b>

### Enumerator training

ACF together with DHO s organized a 1 day refresher training of 20 enumerators in each district except in Kaabong (19), Amudat (18) and Moroto (18).

### Field implementation

The survey was conducted from 15th to 19th of August (phase 1) in southern Karamoja and northern Karamoja from 31st of August to 5th September (phase 2). Six teams comprising of 3 enumerators and 4 were used during five days of data collection.

Supervision of data collection at field level was done by DNFPs supported by ACF technical staff. Few partners participated in the supervision of data collection in the sixth round: Concern worldwide in Nakapiripirit district and UNICEF in Abim.

### Data entry/ analysis



The soft ware's used were ENA for SMART and EpiInfo/ENA. Data entry was done along data collection and plausibility checks were run in order to detect field errors so that adjustments can be done on time.

The DNFPs attended a four day meeting (14th to 17th September) in which the analysis of health and nutrition, anthropometry, food security and WASH sections were done and the draft report produced.

Weighted analysis was used in each of the districts since 480 households were assessed irrespective of the population size. The same was done for livelihood analysis.

Weight calculation: weight was calculated by dividing the total segment population by the number of total answers obtained for that segment.

**Table 3: Design weights attached for anthropometric data analysis for Karamoja Region Nutritional Surveillance Round 6**

	Anthropometric-LHZ weight_a						Total	District weight_a
	Agricultural		Agro-Pastoral		Pastoral			
	answer	weight	answer	weight	answer	weight		
Kaabong	166	499	140	344	219	620	525	508
Kotido			196	230	386	326	582	293
Abim	462	242					462	242
Moroto	49	1170	354	634	59	685	462	697
Amudat			196	233	262	226	458	229
Nakapiripir	261	387	83	431	100	392	444	397

**Table 4: Design weights attached for nutrition security data analysis for Karamoja Region Nutritional Surveillance Round 6**

	FSL - WASHLHZ weight_b						Total	district weight
	AGRIC		AGRO-PASTO		PASTO			
	answer	weigh	answer	weigh	answer	weigh		
Kaabong	144	575	128	376	208	652	480	556
Kotido			112	402	366	343	478	357
Abim	480	233					480	233
Moroto	76	754	298	753	87	464	461	699
Amudat			208	219	272	218	480	218
Nakapiripir	271	373	96	373	112	350	479	368

#### Annex 4: CDC Calculator

In order to increase precision and overcome the potential limitation of the small samples in a survey location, the CDC calculator was used to further analyse the prevalence of GAM and SAM for each district i.e. the probability for survey results to exceed a determined threshold for GAM and SAM rates, and results were calculated taking into account the number of clusters, the design effect, and GAM and SAM point estimates (WHO standards, no exclusion).





**Table 5: Prevalence of GAM Probability thresholds**

Threshold Value	KAABONG	KOTIDO	ABIM	MOROTO/NAPAK	AMUDAT	NAKAPIRIPIRIT
5.0%	99.7%	96.5%	90.0%	100.0%	99.9%	100.0%
7.0%	86.4%	38.9%	47.7%	100.0%	93.9%	99.9%
7.5%	77.0%	23.5%	36.7%	99.9%	88.2%	99.7%
10.0%	20.5%	0.6%	6.6%	93.8%	34.1%	79.7%
11.0%	9.0%	0.1%	2.9%	81.5%	17.2%	55.3%
12.0%	3.6%	0.0%	1.3%	61.4%	7.6%	30.4%
12.5%	2.2%	0.0%	0.8%	50.0%	4.9%	20.7%
15.0%	0.2%	0.0%	0.1%	9.7%	0.4%	1.6%
17.5%	0.0%	0.0%	0.0%	0.9%	0.0%	0.1%
18.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
20.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
22.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 6: Prevalence of SAM Probability thresholds**

Threshold Value	Kaabong	Kotido	Abim	Moroto/Napak	Amudat	Nakapiripirit
0.25%	99.8%	88.2%	100.0%	100.0%	100.0%	100.0%
0.5%	93.1%	50.0%	99.7%	100.0%	100.0%	100.0%
1.0%	57.1%	11.8%	90.8%	100.0%	95.7%	95.0%
1.5%	28.0%	2.8%	68.7%	100.0%	76.4%	69.7%
1.6%	24.1%	2.2%	63.9%	100.0%	71.2%	63.0%
2.0%	13.0%	0.8%	45.8%	99.8%	50.0%	38.3%
2.5%	6.0%	0.2%	28.4%	98.2%	28.7%	17.6%
3.0%	2.8%	0.1%	17.1%	92.1%	15.4%	7.4%
4.0%	0.6%	0.0%	5.9%	61.4%	4.1%	1.2%
4.3%	0.4%	0.0%	4.3%	50.0%	2.7%	0.7%
5.0%	0.2%	0.0%	2.1%	27.3%	1.1%	0.2%
7.5%	0.0%	0.0%	0.2%	1.4%	0.0%	0.0%

Legend	Impossible	Improbable	Probable	Very probable
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**Annex 5: Questionnaires**

**1.1.1 ANTHROPOMETRIC**

District: \_\_\_\_\_ Settlement: \_\_\_\_\_ Parish: \_\_\_\_\_ Village: \_\_\_\_\_

Manyatta: \_\_\_\_\_ Date: \_\_\_\_\_ Cluster no. \_\_\_\_\_ Cluster b \_\_\_\_\_ Team no \_\_\_\_\_

Child #	Sex (F/M)	Age in Months (probe age using calendar of event)	Weight (kg) ±0.1 kg	Height/Length <sup>1</sup> (cm) ±0.1cm	oedema (Y/N)	MUAC (mm)	Measles <sup>2</sup> Vaccination	Vitamin A supplementation in the last 6 months. (Child received red or blue capsule drops)	Did this child have the following illnesses in the last 2 weeks						Is this child enrolled in any feeding program? <sup>4</sup>	If child's MUAC <125, why not enrolled in Program
									Diarrhoea (Y/N)	ORS treatment for diarrhoea (Y/N)	any not using ORS in Rx if Diarrhoea	Malaria (Y/N)	ARI (Y/N)	Measles (Y/N)		

<sup>1</sup> Height measurement standing when child is ≥24 months (height proxy ≥87 cm) and lying down when child is < 24 months (< 87 cm)  
<sup>2</sup> 1 = Yes (with card); 2= Yes (without card); 3= No; 4= don't know 5= Not applicable for children below 9 months.  
<sup>3</sup> 1= Yes (with card); 2= Yes (without card); 3= No; 4= don't know  
<sup>4</sup> 1=OTC, 2=ITC, 3=SFC, 4=Not enrolled



## 1.1.2 Food Security

Date \_\_\_\_\_ Team No. \_\_\_\_\_

## NUTRITION SECURITY QUESTIONNAIRE PART 1

District	Sub - County		Parish		Village		Manyatta		Cluster no	LHZ	
1	2	3	4	5	6	7	8	9	10		
<b>HH No.</b>	<b>Gender of respondent</b> 1=Male 2=Female	<b>Current HH income source</b> 1.Selling livestock 2.Selling crops 3.Selling brew 4.Cash for work/transfer (food aid) 5.Paid employment 6. Cash loan 7.Handicrafts 8.Charcoal/fir wood 9.Begging 10. Other	<b>Usual HH income source</b> 1.As Above 2.Selling livestock 3.Selling crops 4.Selling brew 5.Cash for work/transfer (food aid) 6.Paid employment 7.Cash loan 8.Handicrafts 9.Charcoal/fire wood 10.Begging 11. Other	<b>Main expenses</b> 1.Food 2.Health 3.Education 4.Others (specify)	<b>Current food source</b> 1.Cultivation 2.Hunting/Gathering 3.Borrowing 4.Food 5.Purchasing 6.Barter (exchange) 7. Other	<b>Usual HH food source</b> 1. As Above 2.Cultivation 3.Hunting/Gathering 4. Borrowing 5. Food Aid 6.Purchasing 7.Barter (exchange) 8. Other	<b>Number of days in a 7-day recall period a HH resorted to coping mechanisms when they didn't have enough money or food.</b> 1. Rely on less preferred or less expensive food? 2. Gather wild food, hunt or harvest immature crops? 3. Consume seed stock held for next season? 4. Restrict consumption by adults in order for small children to eat? 5. Feed working members of the household at the expense of non-working members? 6. Reduce number of meals eaten in a day?	<b>Which of the following food groups were consumed in the household in the last 24 hours? (Yes=1 and No=0).</b> <b>C</b> = Cereals(e.g Maize, sorghum, wheat,rice, millet, residue) <b>O</b> = Oils and fats <b>S</b> = Sugar/honey <b>M</b> =Meat, offal and blood <b>ML</b> = Milk and milk products eg butter <b>T</b> =Tubers, roots and plantains eg potatoes, yams, cassava <b>V</b> =Vegetables <b>E</b> =Eggs <b>SCB</b> =Spices, condiments and beverages <b>L</b> = Beans, Lentils, Nuts <b>FR</b> =Fruits <b>F</b> =Fish	<b>Ask how many days in the past 7 days, the household consumed each of the following food items.</b> <b>C</b> =Cereals and tubers (Maize/ posho, sorghum, wheat, rice, cassava, millet, residue, matoke, potatoes) <b>O</b> =Oils and fats(butter, ghee, simsim, sunflower etc) <b>S</b> =Sugar honey/sweets/cakes/soda <b>M</b> =Meat,offal and blood , fish, eggs <b>ML</b> =Milk and milk products eg yoghurt, cheese <b>V</b> =Vegetables ( onion, tomato, boo, akeo, ekadolia, ekoorete, etsaboliet, ejaapo, yellow pumpkin etc) <b>Pulses(P)</b> =Beans Lentils/Nuts eg (beans, peas, groundnuts, simsim) <b>FR</b> =Fruits (mango, pawpaw, ripe banana, ekimune, citrus, passion, etc.)	<b>Which of the following food groups were consumed by children 6-59 months in the last 24 hours? (Yes=1 and No=0).</b> <b>A</b> = Bread, rice noodles, biscuits, cookies, or any other foods made from millet, sorghum, maize, rice, wheat <b>B</b> = Any pumpkin, carrots, squash, or sweet potatoes <b>C</b> = Any white potatoes, white yams, manioc, cassava or any other foods made from roots or tubers? <b>D</b> = Any dark, green, leafy vegetables such as cassava leaves, bean leaves, kale, spinach, pepper leaves, taro leaves, and amaranth leaves? <b>E</b> = Any other vegetables? <b>F</b> = Any ripe mangoes, ripe papayas <b>G</b> =Any other fruits? <b>H</b> = Any beef, pork, lamb, goat, rabbit wild game, chicken, duck, or other birds, or other organ meats? <b>I</b> = liver, kidney, heart, or blood based foods? Any eggs? <b>K</b> = Any fresh or dried fish or shellfish? <b>N</b> =Any foods made from beans, peas, nuts or lentils? <b>Q</b> = Any cheese, yogurt, milk or other milk products? <b>R</b> = Any foods made with oil, fat, or butter? <b>U</b> = Any sugar, soda, candies or honey? <b>W</b> = Any other foods, such as condiments, salt, pepper, coffee, tea, alcoholic beverage?	
							C= O= S= M= ML= T= V= E= SCB= L= FR= F=	C:*2= O:*0.5= S:*0.5= M:*4= ML:*4= V:*1= P:*3= FR:*1=	A= B= C= D= E= F= G= H= I= J= K= N= Q= R= U= W=		





Date \_\_\_\_\_ Team no. \_\_\_\_\_

**NUTRITION SECURITY QUESTIONNAIRE PART**

District \_\_\_\_\_ Sub - County \_\_\_\_\_ Parish \_\_\_\_\_ Village \_\_\_\_\_ Manyatta \_\_\_\_\_ Cluster no \_\_\_\_\_ Livelihood zone \_\_\_\_\_

	11	12	13	14	15	16	17	18	19	20	21
<b>HH N</b>	<b>How many meals did children 6 to 59 months in your HH eat in a day (during the last 24 hours)?</b> 1 = Zero 2 = One 3 = Two 4 = Three 5 = Four and above	<b>Are children 0-6 months in the household exclusively breast fed?</b> 1. Yes 2. No 3. Not Applicable	<b>What is the current main source of water for drinking in your household?</b> 1 = Bore hole 2=Protected well/spring 3=Unprotected well/spring 4= Seasonal stream/pond(Angol) 5=Swamp water 6= Pans (Akuja) 7 = Tap 8 = Other specify	<b>What is the distance to current water source? (minutes)</b>	<b>Household water treatment</b> 1. Lixivia (Bleach) 2. Boiling 3. Solar 4.Flocculent/dis infectant 5. None	<b>Where do you dispose of human waste in your household?</b> 1= Private pit Latrine 2= Community pit latrine 3=Bush 4=Burying in backyard 5=Other(specify)	<b>What do you use to wash hands?</b> 1=soap 2=Ash 3=Water only 4=Others	<b>When are the times you wash your hands with soap?</b> 1. After Defecation 2. Baby Bottom Wash 3. Before feeding child 4. Before food preparation 5. other	<b>Does your household own a ITN (If yes go to 21. if no go to 20)</b> 1=Yes 2=No	<b>Why don't you own a net?</b> 1. Never received 2. Lost 3. Give Away 4.Destroyed 5. Sold 6=Other(specify)	<b>Who slept in the ITN ?</b> 1=children below five 2=children above five 3=Mother 4=Father 5=None



## Annex 6: Data Quality (WHO 2006 Standards)

**Table 22: Data Quality Standards for Karamoja Region Round 6 Nutritional Surveillance**

Variable/test	Acceptable Range	Abim	Kaabong	Kotido	Moroto/ Napak	Amudat	Nakapiripirit	Karamoja
Sample size(no exclusion)	Greater than the calculated sample size (i.e., n=480)	462	525	582	463	458	445	2,935
Out of usual range values(Flags):WHZ	Less than 3% of the sample size	0.2%	0.8%	0.5%	2.4%	0.2%	1.3%	1.0%
Out of usual range values(Flags): HAZ	Less than 5% of the sample size	1.5%	2.7%	1.9%	2.2%	2.0%	2.7%	2.8%
Age ratio(6-29)/(30-59)	between 0.78 and 1.18, Ideal ratio = 0.98	1.31	1.23	1.68	1.29	1.40	1.89	1.45
Out of usual range values(Flags):WAZ	Less than 3% of the sample size	0.0%	1.1%	0.5%	1.1%	0.2%	1.1%	0.7%
Overall sex ratio	between 0.8 and 1.2	0.97	1.08	0.88	1.01	0.86	0.93	0.95
Digit preference score	0-5 good, 5-10 acceptable 10-20 poor 20 unacceptable	7 9 7	4 7 5	5 6 4	7 10 5	6 7 8	3 8 8	2 6 4
Standard deviation WHZ (no exclusion)	between 0.8 and 1.2 z-score	1.05	1.00	1.01	1.16	1.01	1.11	1.06
Design effect (no exclusion)	About 1 - 2	2.05	1.64	1.00	1.28	1.46	1.00	1.40
Standard deviation WAZ (no exclusion)	1.10 and 1.30 z-score	0.95	1.05	1.07	1.13	1.02	1.18	1.09
Standard deviation HAZ (no exclusion)	1.10 and 1.30 z-score	1.19	1.36	1.25	1.37	1.24	1.42	1.36
Skewness WHZ (no exclusion)	Between $\pm 1$	-0.28	-0.30	-0.01	-0.72	0.01	1.20	-0.05
Kurtosis WHZ	Between $\pm 1$	0.37	1.36	0.26	1.05	0.40	12.79	2.81
Index of dispersion (ID) and poison distribution	p > 0.05: Cases appear to be randomly distributed among clusters.	ID=1.70 (P=0.011)	ID=1.41 (P=0.71)	ID=0.65 (P=0.925)	ID=1.06 (P=0.377)	ID=1.13 (P=0.282))	ID=0.77 P=0.806	ID=1.04 (P=0.336)



## Annex 7: Prevalence of acute malnutrition (NCHS 1977 Reference)

Table 23: Combined Nutritional Data for Karamoja Region Round 6 Surveillance

	Kaabong	Kotido	Abim	Moroto/Napak	Amudat	Nakapiripirit
<b>Global Acute Malnutrition</b> W/H < -2 z and/or oedema	<b>9.9 %</b> (7.4 - 13.2)	<b>5.8 %</b> (4.1 - 8.2)	<b>7.8 %</b> (4.6 - 12.8)	<b>12.3 %</b> (9.1 - 16.5)	<b>7.4 %</b> (5.1 - 10.7)	<b>11.9 %</b> (9.4 - 15.0)
<b>Severe Acute Malnutrition</b> W/H < -3 z and/or oedema	<b>0.4 %</b> (0.1 - 2.8)	<b>0.2 %</b> (0.0 - 1.3)	<b>0.4 %</b> (0.1 - 1.8)	<b>1.9 %</b> (0.8 - 4.5)	<b>0.4 %</b> (0.1-1.8)	<b>0.9 %</b> (0.3 - 2.4)
<b>Global Acute Malnutrition</b> W/H < 80% and/or oedema	<b>4.4 %</b> (2.7 - 7.0)	<b>3.3 %</b> (1.9 - 5.4)	<b>4.1 %</b> (2.0 - 8.2)	<b>8.0%</b> (5.8-11.0)	<b>3.9%</b> (2.4-6.3)	<b>7.2%</b> (5.0-10.1)
<b>Severe Acute Malnutrition</b> W/H < 70% and/or oedema	<b>0.2 %</b> (0.0 - 1.4)	<b>0.0 %</b> (0.0 - 0.0)	<b>0.2 %</b> (0.0 - 1.7)	<b>1.5%</b> (0.7-3.3)	<b>0.2%</b> (0.0-1.4)	<b>0.5%</b> (0.1-1.8)