Lopa Lafon Post Harvest Anthropometric and Mortality SMART Survey Final Report

December, 2016

Funded by

Contents

Acknowledgments 5

Executive summary 6

Summary of key anthropometric and mortality findings 6

Recommendations 7

1.0 Background 8

2.0 Survey Objectives 9

2.1 Main Objective 9

2.2 Specific Objectives 9

3.0 Methodology 9

3.1 Study area 9

3.2 Study period 10

3.3 Study design 10

3.4 Study population 10

3.5 Sample size Anthropometry 10

3.6 Sample size mortality 11

3.7: Number of households per cluster 11

3.8: Survey Sample size 12

3.8: Cluster Sampling Strategy 12

3.9: Questionnaire, Training, Survey teams and Supervision 13

3.10: Data entry and analysis 14

4.0: Results 14

4.1: Anthropometric results (based on WHO standards 2006): 14

4.2: Mortality 18

5.0 Additional Variables 18

6.0 Food Consumption Score 19

7.0 Discussion 20

6.0: Recommendations 21

Annexes 22

Annex 1: Selected Clusters 22

Annex 2: Plausibility Report 24

Annex 3: Events calendar 25

Annex 5: Anthropometry questionnaire 26

Annex 6: Mortality questionnaire 27

Annex 7: Food consumption score 28
Annex 8: Plausibility Check of Mortality and Demography Data 29

List of Tables

Table 1 Summary of key anthropometric and mortality findings 6
Table 2: Anthropometry sample size, Lopa Lafon County 10
Table 3: Mortality sample size, Lopa Lafon County 11
Table 4: Percent of households and children 6-59 months included in the survey 12
Table 5: Distribution of age and sex of sample 14
Table 6: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex 15
Table 7: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema 15
Table 8: Distribution of acute malnutrition and oedema based on weight-for-height z-scores 16
Table 9: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex 16
Table 10: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema 16
Table 11: Prevalence of underweight based on weight-for-age z-scores by sex 16
Table 12: Prevalence of underweight by age, based on weight-for-age z-scores 17
Table 13: Prevalence of overweight based on weight for height cut off's and by sex (no oedema) 17
Table 14 : Prevalence of overweight by age, based on weight for height (no oedema) 17
Table 15: Mean z-scores, Design Effects and excluded subjects 17
Table 16: mortality results 18
Table 17: Coverage of vit. A supplementation rate, measles vaccination, LLITN utilization and deworming coverage in Lopa-Lafon County, December 2016 18
Table 18: Point prevalence of child morbidity two prior to the start of the survey 19
Table 19: Prevalence of reported illnesses two weeks prior to the start of the survey in Lopa-Lafon County, December 2016 19
Table 20: Health seeking behaviour in Lopa-Lafon County, December 2016 19
Table 21 : FSC for HHs in Lopa Lafon 19

Acronyms

CBD:	Community Based Distributers
CDR:	Crude Death Rate
CHD:	County Health Department
CI:	Confidence Interval
ENA:	Emergency Nutrition Assessment
EPI:	Expanded Programme on Immunization
GAM:	Global Acute Malnutrition
HH:	Household
ID:	Index of Dispersion
LLITN:	Long Lasting Insecticide Treated Net
MAM:	Moderately Acute Malnutrition
MUAC:	Mid-Upper Arm Circumference
PHCC:	Primary Health Care Centre
PHCU:	Primary Health Care Unit
PPS:	Probability Proportionate to Size
SAM:	Severe Acute Malnutrition
SCI:	Save the Children International
SC:	Stabilisation centre
OTP:	out-patient therapeutic programme
SD:	Standard Deviation
SMART:	Standardized Monitoring and Assessment of Relief and Transitions
SMoH:	State Ministry of Health
SPLM:	Sudan People's Liberation Movement
ST:	Standardization Test
UNICEF:	United Nations Children Education Fund
U5MR:	Under 5 Mortality Rate
WHO:	World Health Organization
WFP:	World food Programme
WHZ:	Weight for Height z-score
FCS:	Food security and Livelihood
IDSR:	Integrated disease and surveillance response
ICCM:	Integrated Community Case Management
CMAM:	Community Management of Acute Malnutrition

Acknowledgments

This survey would not have been possible without the financial support provided by UNICEF and the massive support from save the children International Juba Office and Torit nutrition and logistics departments for facilitation and support.

Special appreciation to the county and SCI security team for their support with regards to security updates and for ensuring smooth operations and providing other relevant information before and during the Survey process

A big thanks to the survey team for their dedication and professionalism during the survey exercise, and sincere gratitude to all the communities from the thirty four selected clusters , caretakers, local authorities and the general community for their cooperation during the survey exercise

I also appreciate NIWG members for their valuable inputs and guidance for the success of this survey.

Survey conducted by: Rufas Soro Denis & Yengi Emmanuel

Report written by: Rufas Soro Denis & Yengi Emmanuel

Executive summary

From date 4th to 10th December, 2016 a total of 422 households in Lopa Lafon County were assessed. This report contains analysis of all indicators assessed in the survey (see Survey Objectives) nutrition anthropometric indicators were assessed among children aged 6-59 months

Table 1 Summary of key anthropometric and mortality findings

Anthropometry

- 422 children were assessed But GAM prevalence was analyzed based on 415 Children age 6-59 months
- Prevalence of GAM was 17.3 %(14.1-21.1 95% CI) and SAM was 2.9% (1.7- 4.9 95% CI) based on Weight-for-Height and the presence of bilateral edema.
- No cases of edema were identified
- Total underweight was 52.6% (46.4-58.8 95% CI) and severe underweight was 20.7% (16.1-26.1 95% CI)

Mortality

- Crude death rate 1.65% (1.01↔2.68 95% C.I)
- Under 5 death rate was 3.26% (1.77↔5.93 95% C.I)

Summary findings have excluded extreme values (SMART Flags— +/- 3SD from the observed mean).

The prevalence of Global Acute Malnutrition in Lopa Lafon County based on weight for height z scores /and or oedema was 17.3% [14.1↔21.1, 95% CI) and the prevalence of Severe Acute Malnutrition was 2.9% [1.7↔4.9, 95% C.I.]. The overall GAM prevalence was above the emergency threshold of 15% based on WHO classification.

The crude mortality and the U5 mortality has increased to above the emergency threshold in 2016. The high mortality in Lopa lafon can be attributed to the non-functionality of most health facilities and lack of services following the recent looting. The nutrition situation is also critical.. The high under five morbidity burden could also contribute to the high underfive mortality which was very high at 77.7% (73.4↔81.5, 95% CI). Fever and diarrhoea were among the most reported illness in both 2016 and 2015

The major reported cause of mortality was illness for both the crude and the under-five mortality which was at 79.1% and 14.6% of the care givers with sick children did not seek medical attention; this shows a poor health seeking behavior

Recommendations

- Continue strengthening emergency nutrition response- SCI (Lopa Lafon- under RRF)
- IDSR system needs to be further strengthened to respond to immediate public health concerns- CHD, SMoH & WHO.
- Improve and prioritize supply of commodities (nutrition and health)- WFP, UNICEF, & SCI
- ICCM interventions just started in Lopa Lafon, CHD team trained and currently moving to the field to train CBDs and supervise
    - ✓ Intensification of ongoing community based interventions especially ICCM interventions is needed
- Conduct qualitative assessment to better understand the root causes of high underfive mortality while intensifying the responses

1.0 Background

The former Eastern Equatorial State lies on the South eastern part of South Sudan. It shares international border with three countries; Ethiopia in the east and Kenya and Uganda in the south. Within the country the state shares borders with central equatorial state to the west and Jonglei state to the north. It subdivided into eight counties named Kapoeta North, Kapoeta East, Kapoeta South-, Budi, Lopa Lafon, Torit, Ikotos and Magwi.[1]

Lopa Lafon County is located in the north western part of State. It is bordered by the following: Jonglei State to the north, Kapoeta County to the east, Torit County to the west, and Ikotos County to the south. Lopa Lafon is a mixed terrain with hills; valley and flat plains. It is sub-divided into eight Payams namely; Arhilo, Burgilo, Imehejek, Kurumi, Lohutok, Longiro, Marguna & Pachidi Payams. The population of the county is estimated at 126,808. There are two main ethnic groups; namely: Pari and Lopit. The majority of the populations in the county are pastoralists and agro-pastoralists.[2]

Save the children is operating in Eastern Equatorial State with field offices in Torit, Lopa Lafon, Magwi and Kapoeta. SCI has health and nutrition intervention in most of the counties in Eastern Equatorial State. As part of SCI nutrition programing, this SMART survey was conducted in Lopa Lafon County to understand the nutrition situation in the County.

The last anthropometric SMART survey conducted last year (June 2015) by SCI showed a Global Acute Malnutrition Rate of 18.1% (14.8↔ 22.6, 95% C.I.) and a Severe Acute Malnutrition Rate of 5% (3.4 ↔7.1, 95% C.I) indicating a critical nutrition situation in the area[3].

The morbidity rate for last year was at 63.9% (438) in the past two weeks prior to the survey date. The perceived cause of illness among the sick children were also assessed, fever/malaria diseases was the most reported illness with point prevalence of 37.9 %(261) and followed by diarrheal disease with prevalence of 27.8% (191). Malaria, diarrheal disease and ARI are among the leading cause of morbidity and mortality

[1] SMART survey, Lopa Lafon, Save the Children, June 2015
[2] SMART survey, Lopa Lafon, Save the Children, June 2015
[3] SMART survey, Lopa Lafon, Save the Children , June 2015

2.0 Survey Objectives

2.1 Main Objective

The main objective of this survey was to determine the current nutrition status of population of Lopa Lafon County to help as a bench mark for the program implementation.

2.2 Specific Objectives

- To estimate the prevalence of acute malnutrition in children aged 6 to 59 months.
- To estimate retrospective Crude and under five Mortality Rates (CMR and U5MR) and morbidity among under five children.
- To assess the morbidity of children 6-59 months and health seeking behavior of mothers
- Assess Measles vaccination, vitamin A supplementation and deworming coverage among children 6 to 59 months.
- To assess the food consumption score of households in Lopa Lafon county
- To make recommendations based on findings

3.0 Methodology

3.1 Study area

The survey was conducted in Lopa Lafon County, South Sudan

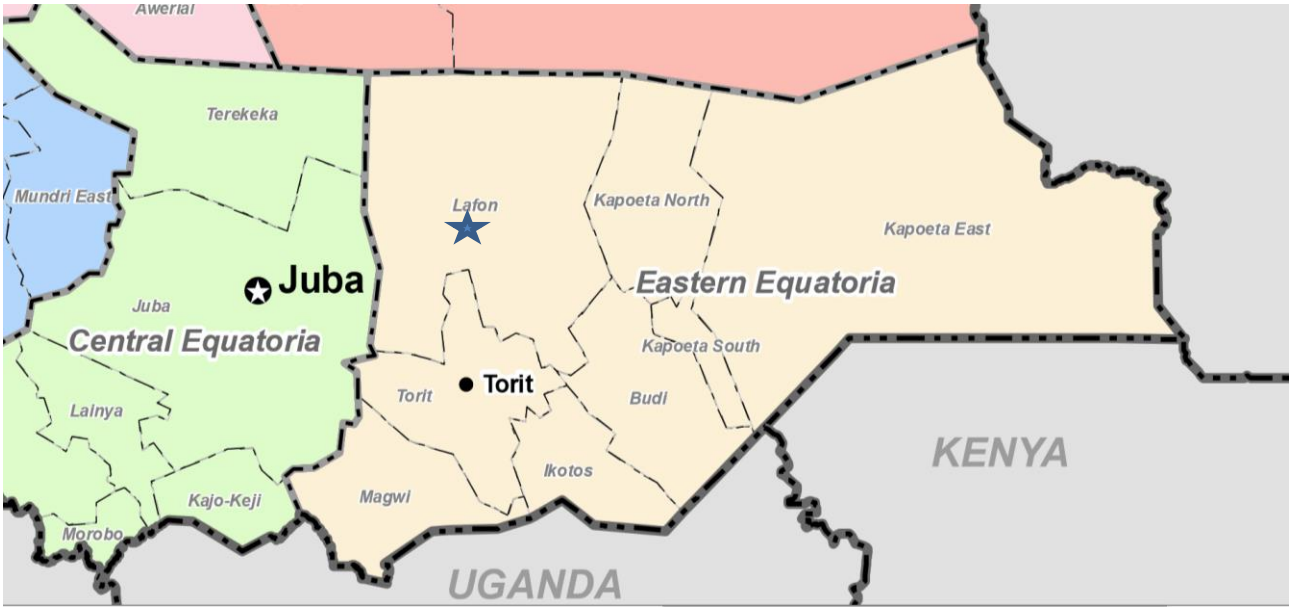

Figure 1: Map of former Easter Equatorial State

3.2 Study period

The study was conducted from 4th to 10th /December, 2016.

3.3 Study design

The survey was a cross sectional study with two-stage cluster sampling using Standardized Monitoring of Relief and Transition (SMART) methodology. Villages are considered as the smallest geographical unit (clusters).

3.4 Study population

Children 6 – 59 months old: Anthropometric measurements and edema was measured from children 6-59 months old in the sampled household in all selected villages.

Household members: To estimate the crude mortality rate relevant information was gathered related to all residents of the sampled households in all selected villages.

3.5 Sample size Anthropometry

The sample size for the nutrition survey was determined using ENA for SMART software (July 9th, 2015 version). The following assumptions based on the given context were made to obtain the number of children and households to be included in the survey.

Table 2: Anthropometry sample size, Lopa Lafon County

Data Entered in the ENA	Anthropometry sample	Remark
Estimated prevalence	18.4	SMART Survey, Lopa Lafon County, SCI, June 2015
Precision	5	As recommended by SMART methodology
Design effect	1.69	SMART Survey, Lopa Lafon County, SCI, June 2015
Average household size	6.2	SMART Survey, Lopa Lafon County, SCI, June 2015
% under five	19.9	SMART Survey, Lopa Lafon County, SCI, June 2015
% non-response	5	Anticipated
Children to be included	424	
Households to be included	402	

3.6 Sample size mortality

The sample size for the retrospective mortality survey was determined using ENA for SMART software (version July 9th, 2015). The following assumptions based on the given context were made to obtain the population and number of household to be included.

Table 3: Mortality sample size, Lopa Lafon County

Data Entered in the ENA	Mortality sample	Remark
Estimated CMR	0.31	SMART Survey, Lopa Lafon County, SCI, June 2015
Precision	0.25	
Design effect	1.11	SMART Survey, Lopa Lafon County, SCI, June 2015
Average household size	6.2	SMART Survey, Lopa Lafon County, SCI, June 2015
% non-response	5	Anticipated
Recall period (days)	90	To be confirmed in the field
Population to be included	2558	
Households to be included	434	

3.7: Number of households per cluster

The number of households to be completed per day was determined according to the time the team could spend on the field excluding transportation, other procedures and break times. The details below are taken into consideration when performing this calculation based on the given context:

1. Departure from office at 7:00 am and back at 5:00 pm.
2. Average travel time to reach each cluster (one-way): 1 hrs.
3. Duration for initial introduction and selection of households: 30 min.
4. Time spent to move from one household to the next: 10 min.
5. Average time in the household: 20 min.
6. Breaks: 1 lunch break of 1hr.

The above gave an average 10 hours of working time in each cluster. If on average teams spend 20 min in each HH and 10 min traveling from one HH to another, each team can comfortably reach 13 HH per day.

The total number of households in the sample was then divided by the number of households to be completed in one day to determine the number of clusters to be included in the survey.

434/13=33.3 (34 cluster)

3.8: Survey Sample size

It was determined that a total of 424 children 6-59 months which included 402 households were required for the anthropometric survey and a total of 2558 persons in 434 households were required for the retrospective mortality survey as a representative sample .

As the two indicators always produce different household samples, the larger, which is the Mortality sample which required the highest number of households was used for both anthropometry and mortality surveys.

All randomly selected households were included in the survey; the total number of 6-59 months children included in the survey, 422 (99.5%) which was more than the 80% minimum sample size required by the SMART methodology.

Table 4: Percent of households and children 6-59 months included in the survey

Number of HH planned	Number of HH surveyed	% surveyed /planned	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% surveyed /planned
434	422	97.2 %	424	422	99.5%

The overall population intended for the survey was 2,112 persons. However a population of 2396 was recorded in the survey giving an overall percentage of 113% which is above 90%.

3.8: Cluster Sampling Strategy

3.8.1: First stage sampling- Selection of clusters

The first stage, which was selection of clusters, was based on probability proportional to population size (PPS). A list of all villages with their respective population sizes was obtained from the CHD and SMoH. All villages were considered as clusters, no village was excluded for the random selection and no reserve cluster was used during the assessment

All the clusters (from the updated sampling frame) with their respective population sizes were entered into ENA for SMART (July 9th, 2015 version), and 34 clusters were selected using probability proportional to size (PPS).

3.8.2: Second stage sampling- Selection of households

Household definition: Household was defined as a group of people living under same roof and sharing food from the same cooking pot. In home with multiple wives, those living and eating in

different houses are considered as separate HHs. Wives living in different houses and eating from same pot are considered as one HH.

Sample households were selected using simple random sampling as per the recommendation of SMART methodology[4]. This household selection method was preferred because it is objective, easy for monitoring and makes the process more transparent to the local community. Preliminary contact with local village leader was made to prepare household lists in each village which was updated and used in sampling as sampling frame. Supervisors used ENA generated random number table to select the households from the sampling frame (household list).

The non-response was at 2.7 %, this was because most of the selected households heads in this case the mothers or the fathers are either not present at home during the survey or they have travelled a long distant to their farms for harvest in search of food for their families, The teams revisited these households but failed in the second attempt that same day, so no replacements were done for these households.

3.9: Questionnaire, Training, Survey teams and Supervision

3.9.1: Questionnaire

The questionnaires were asked in English language and translated into the local and Arabic language which was common in the town. The questionnaire was pre-tested (piloted) before the survey. Copies of the questionnaires are attached in the annex.

3.9.2: Training

Training was conducted for four days with standardization and pre-test inclusive.

3.9.3: Survey teams

The survey was conducted using 6 teams; each team comprising of 4 members (1 survey supervisor, 1 team leader/interviewer and 2 enumerators). Each team was assisted by a village guide to lead the survey team to the selected households.

3.9.4: Field Supervision

[4] www.SMARTmethodology.com

The team leaders were responsible for the overall quality of activities and teams performance. Additionally, four supervisors, two from CHD and two from SMoH and a survey officer from SCI and a representative from save the children nutrition department supervised the teams throughout the survey.

Each questionnaire and data sheet was checked each night prior to the data entry. The data was entered on daily basis and missing or flag data identified. Based on the results supervisors were giving feedback to team members. For Missing and flagged data observed after daily entry and analysis, routine remedies like revisiting the household, directly correcting the team with problem was made

3.10: Data entry and analysis

The data for anthropometry and mortality was entered and analyzed in ENA for SMART software (July 9th, 2016 version) while food consumption score data was entered in excel and analyzed in EPI info. A random check on a certain percentage of entered records was done every day by the survey officer. Seven outliers in anthropometry data were excluded from the analysis. The boundaries for exclusion were defined as +/- 3 SD of WHZ from the observed WHZ mean.

4.0: Results

4.1: Anthropometric results (based on WHO standards 2006):

Exclusion of z-scores from Observed mean SMART flags: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3

Table 5: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	46	46.9	52	53.1	98	23.2	0.9
18-29	44	43.1	58	56.9	102	24.2	0.8
30-41	34	37.4	57	62.6	91	21.6	0.6
42-53	48	52.2	44	47.8	92	21.8	1.1
54-59	21	53.8	18	46.2	39	9.2	1.2
Total	193	45.7	229	54.3	422	100.0	0.8

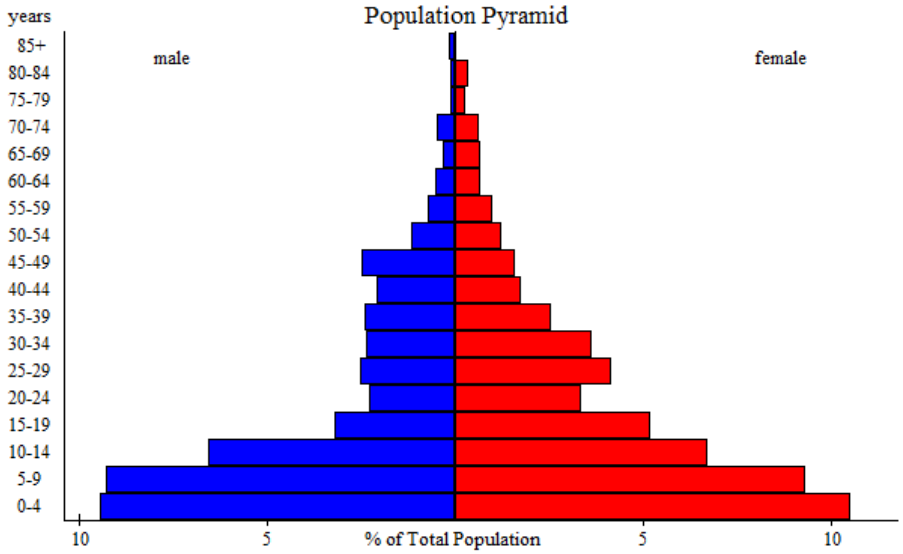

Figure 1: Population age and sex pyramid

Error! Reference source not found.

Table 6: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 415	Boys n = 188	Girls n = 227
Prevalence of global malnutrition (<-2 z-score and/or edema)	(72) 17.3 % (14.1 - 21.1 95% C.I.)	(31) 16.5 % (12.2 - 21.9 95% C.I.)	(41) 18.1 % (13.2 - 24.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no edema)	(60) 14.5 % (11.7 - 17.7 95% C.I.)	(25) 13.3 % (9.5 - 18.3 95% C.I.)	(35) 15.4 % (11.0 - 21.2 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or edema)	(12) 2.9 % (1.7 - 4.9 95% C.I.)	(6) 3.2 % (1.3 - 7.5 95% C.I.)	(6) 2.6 % (1.2 - 5.6 95% C.I.)

The prevalence of oedema is 0.0 %

Table 7: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Edema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	97	3	3.1	26	26.8	68	70.1	0	0.0
18-29	98	4	4.1	15	15.3	79	80.6	0	0.0
30-41	89	2	2.2	8	9.0	79	88.8	0	0.0
42-53	92	3	3.3	10	10.9	79	85.9	0	0.0
54-59	39	0	0.0	1	2.6	38	97.4	0	0.0
Total	415	12	2.9	60	14.5	343	82.7	0	0.0

Table 8: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	>=-3 z-score
Edema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Edema absent	Marasmic No. 18 (4.3 %)	Not severely malnourished No. 403 (95.7 %)

Table 9: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 422	Boys n = 193	Girls n = 229
Prevalence of global malnutrition (< 125 mm and/or edema)	(56) 13.3 % (10.1 - 17.2 95% C.I.)	(21) 10.9 % (6.9 - 16.8 95% C.I.)	(35) 15.3 % (10.9 - 21.1 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no edema)	(44) 10.4 % (7.8 - 13.8 95% C.I.)	(15) 7.8 % (4.5 - 13.2 95% C.I.)	(29) 12.7 % (8.8 - 17.9 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or edema)	(12) 2.8 % (1.4 - 5.7 95% C.I.)	(6) 3.1 % (1.2 - 7.6 95% C.I.)	(6) 2.6 % (1.0 - 6.5 95% C.I.)

Table 10: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Edema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	98	5	5.1	18	18.4	75	76.5	0	0.0
18-29	102	4	3.9	13	12.7	85	83.3	0	0.0
30-41	91	1	1.1	9	9.9	81	89.0	0	0.0
42-53	92	2	2.2	3	3.3	87	94.6	0	0.0
54-59	39	0	0.0	1	2.6	38	97.4	0	0.0
Total	422	12	2.8	44	10.4	366	86.7	0	0.0

Table 11: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 416	Boys n = 192	Girls n = 224
Prevalence of underweight (<-2 z-score)	(219) 52.6 % (46.4 - 58.8 95% C.I.)	(102) 53.1 % (44.1 - 62.0 95% C.I.)	(117) 52.2 % (45.2 - 59.1 95% C.I.)
Prevalence of moderate underweight(<-2 z-score and >=-3 z-score)	(133) 32.0 % (26.9 - 37.5 95% C.I.)	(57) 29.7 % (21.7 - 39.1 95% C.I.)	(76) 33.9 % (28.5 - 39.8 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(86) 20.7 % (16.1 - 26.1 95% C.I.)	(45) 23.4 % (17.8 - 30.2 95% C.I.)	(41) 18.3 % (12.8 - 25.4 95% C.I.)

Table 12: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Edema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	96	16	16.7	26	27.1	54	56.3	0	0.0
18-29	98	21	21.4	35	35.7	42	42.9	0	0.0
30-41	91	22	24.2	28	30.8	41	45.1	0	0.0
42-53	92	25	27.2	25	27.2	42	45.7	0	0.0
54-59	39	2	5.1	19	48.7	18	46.2	0	0.0
Total	416	86	20.7	133	32.0	197	47.4	0	0.0

Table 13: Prevalence of overweight based on weight for height cut off's and by sex (no oedema)

	All n = 415	Boys n = 188	Girls n = 227
Prevalence of overweight (WHZ > 2)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Table 14 : Prevalence of overweight by age, based on weight for height (no oedema)

		Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
Age (months)	Total no.	No.	%	No.	%
6-17	97	0	0.0	0	0.0
18-29	98	0	0.0	0	0.0
30-41	89	0	0.0	0	0.0
42-53	92	0	0.0	0	0.0
54-59	39	0	0.0	0	0.0
Total	415	0	0.0	0	0.0

Table 15: Mean z-scores, Design Effects and excluded subjects

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	415	-1.08±0.97	1.00	1	6
Weight-for-Age	416	-2.02±1.17	1.56	0	6
Height-for-Age	396	-2.19±1.37	1.80	0	26

* contains for WHZ and WAZ the children with edema.

4.2: Mortality

Mortality data was collected using the mortality individual questionnaire, summary of results are summarized, and both CDR and U5MR are above the emergency threshold.

Table 16: mortality results

Parameters for Mortality (95% CI)	Results (CI 95%)
CMR (total deaths/10,000 people / day):	1.65 (1.01↔2.68)
U5MR (deaths in children under five/10,000 children under five / day):	3.26 (1.77↔5.93)
Persons recorded within recall period	2396.5
Percentage of children under five	20.7
Average household size	5.7
Total deaths during the recall period	43
Deaths during the recall period < 5 years old	26
Recall Period (days)	109
Causes of death	
Illness	79.1
Violence/Conflict	11.6
Injury/traumatic	4.7
Unknown	2.3
Drowning	2.3
Location of death	
In current location	79.1
In place of last residence	14.0
During migration	7.0

5.0 Additional Variables

Table 17: Coverage of vit. A supplementation rate, measles vaccination, LLITN utilization and deworming coverage in Lopa-Lafon County, December 2016

Parameters	n	N	%	95% C.I
Vitamin A	302	422	71.6	67.0↔75.8
Measles vaccination (9-59 months) by recall	162	400	40.5	35.7↔45.5
Measles vaccination (9-59 months) by card	58	400	14.5	11.3↔18.4
Measles vaccination <9 months	1	400	0.3	0.0↔1.6
LLITN utilization (6-59 months)	368	422	87.2	83.5↔90.2
Deworming (12-59 months)	116	385	30.1	25.6↔35.0

Table 18: Point prevalence of child morbidity two prior to the start of the survey

Parameter	n	N	%	95% C.I
Illness	328	422	77.7	73.4↔81.5

The illness prevalence in Lopa-Lafon is very high as witnessed in the report; this could be the major contributing factor for the above emergency threshold of U5 mortality rate in the county

Table 19: Prevalence of reported illnesses two weeks prior to the start of the survey in Lopa-Lafon County, December 2016

Type of illness	n	N	%	95% C.I
Fever	144	328	43.9	38.5↔49.5
Diarrhoea	115	328	35.1	30.0↔40.5
Cough	46	328	14.0	10.5↔18.4
Other	23	328	7.0	4.6↔10.5

Table 20: Health seeking behaviour in Lopa-Lafon County, December 2016

Parameter	n	N	%	95% C.I
PHCC/U	238	328	72.6	67.4↔77.3
None	48	328	14.6	11.1↔19.0
Traditional healers	27	328	8.2	5.6↔11.9
Hospital	9	328	2.7	1.3↔5.3
Private clinic	4	328	1.2	0.4↔3.3
Mobile clinic	1	328	0.3	0.0↔2.0
Pharmacist	1	328	0.3	0.0↔2.0

6.0 Food Consumption Score

420 households were assessed to find out their Food consumption score and was calculated using the frequency of consumption of different food groups consumed by households seven days prior to the survey.

According to the observation made, many households mostly rely on vegetables for their meals and the consumption of cereals is commendable. Two households were not assessed because they were mourning.

Table 21 : FSC for HHs in Lopa Lafon

	Thresholds	Households	%
Poor	0-21	83	19.7
Baseline	21.5-35	160	38.09
Acceptable	>35	177	42.14

7.0 Discussion

The prevalence of GAM in Lopa Lafon was 17.3 %(14.1-21.1 95% CI), which is above the emergency threshold. When compared with last year's prevalence there was no significant change (P=0.6808). The nutrition situation was expected to improve as this is the post-harvest survey unlike June 2015 survey. The high morbidity burden in the county, food security and livelihood, and insecurity could be the major contributing factors to the above emergency GAM rate in the county

Design Effect Known

Enter the sample size, the prevalence, the design effect and the number of clusters

Survey 1

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n1		p1	Deff1	C1	$s1^2$	se
686		18.40%	1.69	35	0.00037	0.019232

Survey 2

Total Sample Size		Prevalence	Design Effect	Number of Clusters	Estimated Variance	
n2		p2	Deff2	C2	$s2^2$	se
422		17.30%	1.00	34	0.000339	0.018413

p1-p2	Pooled Variance	T	p	DF	2 sided	1 sided
1.10%	2.66%	0.41	0.6808	67	31.9%	66.0%

Figure 2: Significance test calculator for two surveys

Crude Mortality and under five mortality rate was also above the emergency thresholds of 1.65 % (1.01↔2.68) and 3.26% (1.77↔5.93) for Crude and U5 mortality rate respectively. While in 2015, it was 0.31% and 0.44 % for Crude and U5 mortality rate respectively. The contributing factors of high morbidity and poor health seeking behaviour could be responsible for the high mortality.

Morbidity rate among children 6-59months was at 77.7%, with fever and diarrhoea being the most prevalent illness in the county. In comparison to the last year's morbidity, it shows that the situation has worsened. This could be the reason for the high Mortality rate in the U5s

The health seeking behaviour of caregivers with children 6-59 months, 14.6% of the mothers with sick children did not seek medical attention. This could have a negative impact on the child's health

Measles vaccination coverage is at 55%, Vitamin A supplementation at 71.6% while deworming coverage is at 30.1% which are all low

Most of the households have an acceptable food consumption score threshold but mostly limited to certain foods like mostly cereals and vegetables. This has a negative impact in their dietary diversity

6.0: Recommendations

- Continue strengthening emergency nutrition response- SCI (Lopa Lafon- under RRF)
- IDSR system needs to be further strengthened to respond to immediate public health concerns- CHD, SMoH & WHO.
- Improve and prioritize supply of commodities (nutrition and health)- WFP, UNICEF, & SCI
- ICCM interventions just started in Lopa Lafon, CHD team trained and currently moving to the field to train CBDs and supervise
    - ✓ Intensification of ongoing community based interventions especially ICCM interventions is needed
- IOM RRF funded emergency nutrition response activities have already started Lopa Lafon, however movement remains a big challenge as road movement is currently restricted.
    - ✓ Recommend UNHAS start flight
- Conduct qualitative assessment to better understand the root causes of underfive mortality while intensifying the responses

Annexes

Annex 1: Selected Clusters

Geographical unit	Population size	Cluster
Ahado	372	
Wiliwili	2170	1
Mura	620	2
Obitihi	1116	
Idwa	248	3
Hatolok	310	
Loming	620	
Ofuluho	124	
Fuara	1550	4
Hidere	558	5
Ongijia	434	
Sohot	372	
Husa	310	
Ibahura	1240	6
Ibonni	1860	7
Ohilang	744	8
Imuluha	1054	
Atarangi	310	RC
Ibele	186	
Imehejek	1860	9
Ihirand	1550	10
Murah Lopit	3100	11,12
Habirongi	930	13
Ohobohobo	620	
Ohinyang	124	
Gari	744	
Der	620	14
Waatou	868	
Limboruo	992	15
Nyidida	1240	RC
Ayemo	868	
Ukweri	1054	16
Bura	1860	17
Adumac	682	18
Kurkujo	558	
Parau	930	19
Puchwa	651	
Aluori	372	
Kor	1550	20
Nyamura	1116	21

Angulumere	570	
Pukwanyi	440	22
Malyang	639	
Leteji	1116	23
Ngalofi	930	
Tare	812	24
Imedu	453	
Lohudum	149	
Lobele	155	
Momoi	180	
Loluro	1321	25
Bari Lopit	353	
Lohidomok	248	RC
Lomerok 1	818	
Lomerok 2	676	26
Buara	515	
Lohomiling	781	
Lodo	732	27
Haba	874	
Hiteher	595	28
Liria	539	
Loturumo	1345	29
Maitong	639	
Irube	291	30
Longiro center	670	
Hiyahi	1482	31
Lobuhanga	1159	32
Losou	440	
Lodongiok	198	
Idali	924	33
Taudere	930	
Lohutil	632	34
Fuara	564	
Ihonga	502	
Lotodo	614	RC

Annex 2: Plausibility Report

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	0 (1.4 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	2 (p=0.080)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	0 (p=0.551)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	0 (5)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	2 (11)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	2 (12)
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.							
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	0 (0.97)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	1 (-0.22)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	0 (-0.03)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	0 (p=0.752)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	7 %

The overall score of this survey is 7 %, this is excellent.

Annex 3: Events calendar

Local events calendar for Lopa-Lafon (December 2016 Post-Harvest SMART Survey)

	2012	2013	2014	2015	2016
January	59 New year	47 New year	35 New year	23 New year	11 New year
February	58 Lam	46 Lam	34 Lam	22 Lam	10 Lam
March	57 Koor Land preparation Beginning of rain	45 Koor Land preparation Beginning of rain	33 Koor Land preparation Beginning of rain	21 Koor Land preparation Beginning of rain	9 Koor Land preparation Beginning of rain
April	56 Easter holidays Planting of crops begins	44 Easter holidays Planting of crops begins	32 Easter holidays Planting of crops begins	20 Easter holidays Planting of crops begins	8 Easter holidays Planting of crops begins
May	55 Labour day SPLM/A liberation day	43 Labour day SPLM/A liberation day	31 Labour day SPLM/A liberation day	19 Labour day SPLM/A liberation day	7 Labour day SPLM/A liberation day
June	54 Weeding	42 Weeding	30 Weeding	18 Weeding	6 Weeding Death of king Upwoo
July	53 Independence day Martyrs day Scaring of birds begins	41 Independence day Martyrs day Scaring of birds begins	29 Independence day Martyrs day Scaring of birds begins	17 Independence day Martyrs day Scaring of birds begins	5 Independence day J1 Incidence Martyrs day Scaring of birds begins
August	52 Scaring of birds continues	40 Scaring of birds continues	28 Scaring of birds continues	16 Scaring of birds continues	4 Scaring of birds continues Lafon crisis Governor's visit
September	51 Harvesting begins	39 Harvesting begins	27 Harvesting begins	15 Harvesting begins	3 Harvesting begins
October	50 Harvesting continues	38 Harvesting continues	26 Harvesting continues	14 Harvesting continues	2 Harvesting continues
November	49 Bush burning begins Juok ino Nyalum	37 Bush burning begins Juok ino Nyalum	25 Bush burning begins Juok ino Nyalum	13 Bush burning begins Juok ino Nyalum	1 Bush burning begins Juok ino Nyalum
December	48 Christmas	36 Christmas Juba crisis	24 Christmas Daru inauguration ceremony	12 Christmas	0 Christmas

Annex 5: Anthropometry questionnaire

ANTHROPOMETRIC & HEALTH QUESTIONNAIRE

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

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

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Child No.	HHNO	Child Name	Sex **m** = Male **f** = Female	Date of Birth (DD/MMYY)	Age in months	Weght in Kg (eg 12.4)	Height in cm (eg 78.1)	Oedema **n** = No **y** =Yes	MUAC in cm (eg 11.3)	Vit. A in last 6 months --------- **0** = No **1** =Yes	Measles Vaccine ---- **0** = No **1** =Yes with EPI card **2** =Yes recall **3** = Child <9m	Illness in past 14 days? **0** = No **1** =Yes If no, go to 16	Type of Illness **1** = Fever **2** = Cough **3** = Diarrhoea 99 = Other (specify)	Treatment Sought: **0** = None **1** =Hospital **2** =PHCC/U **3** = Mobile /outreach clinic **4**=CBD **5**=Private clinic **6**=Traditional practitioner **7**=Pharmacy/chemist **99**=Other (Specify)	Did the child sleep under a mosquito net(LLITN) last night? --------- 0= No 1= Yes	Dewormed in last 6 months (12-59 months) ------- **0** = No **1** =Yes 88 =DK
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
20																
21																

Annex 6: Mortality questionnaire

DEMOGRAPHY & MORTALITY QUESTIONNAIRE

DATE OF INTERVIEW:

COUNTY:	PAYAM:	NAME OF INTERVIEWER:	
BOMA:	VILLAGE:		
CLUSTER NO.	TEAM NO.	HH NO	

1	2	3	4	5	6	7	8	9	10
No.	Name	Sex (M/F)	Age (years)	Joined on or after:	Left on or after:	Born on or after:	Died on or after:	Cause of death 1=illness 2=injury	Location of death 1=current 2=during migration 3=in place of last residence 99=other,
				_____					
a) List all the people that slept in this household last night.									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
b) List all the people that slept in this household on the **first night of the recall period (FILL IN DATE/EVENT)** but did **NOT sleep** in the **household last night**.									
1					Y				
2					Y				
3					Y				
4					Y				
5					Y				
6					Y				
c) List all the people that slept in this household on the **first night of the recall period but have since died**									
1							Y		
2							Y		
3							Y		
4							Y		

Was anyone in the household pregnant at the start of the recall period? No [ ] Yes [ ] If yes, how many? _____

[1] HH definition: Group of people living under same roof & sharing food from the same pot . In home with multiple wives, those living and eating in different houses are considered as separate HHs. Wives living in different houses and eating from same pot are considered as one HH.

Annex 7: Food consumption score

29	**Food Consumption Score**							
Over the last 7 days, how many days did your household consume the following foods?								
HHNO	Cereals & tubers (maize, rice, sorghum, cassava, potatoes, etc)?	Pulses (beans, peas, groundnuts, green grams, etc)?	Vegetables?	Fruits?	Animal source foods (meat, fish, eggs)?	Milk & dairy products?	Sugar and honey *(e.g.sweetened foods, drinks, chocolates, sweets, candies, etc)?*	Oils/fats *(e.g. fat or oil, butter, ghee, margarine added to food or used for cooking)?*

Annex 8: Plausibility Check of Mortality and Demography Data

Missing or wrong data:

Lines with missing information about Cluster, Household or Team:

Lines where sex or age are missing:

Lines where a child is born with an age older than 1 year:

Duplicate data:

Lines where all identifier variables (Cluster, Household and Team) are identical:

Lines where the household members data is identical:87 and 299, 312 and 421

Lines where both identifier variables and household members data are identical:

Unusual values - Births and Deaths:

Lines with more than 1 birth in a household:322

Lines with more than 2 deaths in a household:

Households per Cluster

Cluster No.	No. of HH	No. of HH with children <5	% of HH with children <5
1	10	8	80.0
2	13	10	76.9
3	9	5	55.6
4	13	11	84.6
5	13	10	76.9
6	13	10	76.9
7	13	7	53.8
8	13	8	61.5
9	10	9	90.0
10	13	11	84.6
11	13	6	46.2
12	13	8	61.5
13	13	9	69.2
14	13	11	84.6
15	13	8	61.5
16	11	7	63.6
17	11	6	54.5
18	12	5	41.7
19	13	7	53.8

20	12	9	75.0
21	13	10	76.9
22	12	8	66.7
23	12	12	100.0
24	13	12	92.3
25	13	12	92.3
26	13	10	76.9
27	13	11	84.6
28	13	12	92.3
29	12	10	83.3
30	13	6	46.2
31	12	8	66.7
32	13	9	69.2
33	13	12	92.3
34	13	10	76.9

Age distribution:

All individuals are included in the following chart, including those who were born died joined and left during the recall period.

Age < 1 : ##################################
Age < 2 : ######################################
Age < 3 : ##################################
Age < 4 : ##################################
Age < 5 : ###################
Age < 6 : ##
Age < 7 : ##############################
Age < 8 : ######################################
Age < 9 : ########################
Age < 10 : ##################################
Age < 11 : ############
Age < 12 : ##########################
Age < 13 : ###################
Age < 14 : #################
Age < 15 : #################
Age < 16 : ###############
Age < 17 : ###########
Age < 18 : ###################
Age < 19 : ##########
Age < 20 : #################
Age < 21 : #########
Age < 22 : #########
Age < 23 : ########
Age < 24 : ######
Age < 25 : ###############
Age < 26 : ##########
Age < 27 : ########
Age < 28 : ####################
Age < 29 : #########
Age < 30 : ############################
Age < 31 : ####

Age < 32 : #########
Age < 33 : #######
Age < 34 : ######
Age < 35 : ####################
Age < 36 : ####
Age < 37 : #####
Age < 38 : ###########
Age < 39 : #####
Age < 40 : ###################
Age < 41 : #####
Age < 42 : ########
Age < 43 : ###
Age < 44 : ####
Age < 45 : #########
Age < 46 : ####
Age < 47 : ######
Age < 48 : ################
Age < 49 : ####
Age < 50 : ################
Age < 51 : ##
Age < 52 : ###
Age < 53 : #
Age < 54 : ##
Age < 55 : #####
Age < 56 : ###
Age < 57 : ##
Age < 58 : ###
Age < 59 : ##
Age < 60 : ########
Age < 61 : #
Age < 62 : ##
Age < 63 :
Age < 64 : ##
Age < 65 : ####
Age < 66 : #
Age < 67 : ##
Age < 68 :
Age < 69 : #
Age < 70 : #######

Statistical evaluation of sex and age ratios (using Chi squared statistic):
The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: (U5) p-value = 0.303 (boys and girls equally represented)
Overall age distribution: (U5) p-value = 0.002 (significant difference)
(Note: test by two age categories: 0-<2, 2-<5)
Overall sex/age distribution: (U5) p-value = 0.000 (significant difference)
(Note: test by four age/sex categories: M 0-<2, M 2-<5, F 0-<2, F 2-<5) ; test against a ratio of 0.7

Overall sex ratio: (U10) p-value = 0.456 (boys and girls equally represented)
Overall age distribution: (U10) p-value = 0.859 (as expected)
(Note: test by two age categories: 0-<5, 5-<10); test against a ratio of 1.1

Overall sex/age distribution: (U10) p-value = 0.296 (as expected)
(Note: test by four age/sex categories: M 0-<5, M 5-<10, F 0-<5, F 5-<10)

Poisson Distributions

Distribution of HH Size: ID=1.05 (p=0.235)
Distribution of U5s per household: ID=0.36 (p=1.000)
(Note: test run on all households, not within each cluster)
Distribution of deaths per cluster: ID=2.51 (p=0.000)
Distribution of U5 deaths per cluster: ID=1.36 (p=0.080)
Distribution of births per cluster: ID=1.30 (p=0.114)
(Note: test run per cluster - just like ID in anthro)

The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). If the ID is less than 1 and p > 0.95 it indicates that the cases are UNIFORMLY distributed among the clusters.If the p value is between 0.05 and 0.95 the cases appear to be randomly distributed among the clusters, if ID is higher than 1 and p is less than 0.05 the cases are aggregated into certain cluster (there appear to be pockets of cases).