# RAPID NUTRITION SURVEY

## FINAL REPORT

## Makpandu Refugee Settlement

## Yambio

## South Sudan

Surveys conducted: 23-27 October 2017

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS ..... 2
ACKNOWLEDGMENTS ..... 3
EXECUTIVE SUMMARY ..... 4
INTRODUCTION ..... 9
BACKGROUND ..... 9
*Food Security* ..... *9*
*Health situation* ..... *10*
*Nutrition Situation* ..... *11*
*WASH Situation* ..... *12*
SURVEY OBJECTIVES ..... 12
METHODOLOGY ..... 12
*Sample size* ..... *12*
*Sampling procedure: selecting households and individuals* ..... *13*
*Questionnaires* ..... *14*
*Measurement methods* ..... *14*
*Case definitions and calculations* ..... *15*
*Classification of public health problems and targets* ..... *16*
*Training, coordination and supervision* ..... *17*
*Data collection,entry and analysis* ..... *17*
RESULTS FROM MAKPANDU ..... 18
LIMITATIONS ..... 24
DISCUSSION ..... 24
RECOMMENDATIONS ..... 26
APPENDIX 1 - NAMES OF CONTRIBUTORS ..... 28
APPENDIX 2 - SUMMARY OF OVERALL QUALITY OF ANTHROPOMETRIC DATA ..... 29
APPENDIX 3 - SURVEY QUESTIONNAIRES ..... 29
APPENDIX 4 - EVENTS CALENDER ..... 31
APPENDIX 5 - MAKPANDU REFUGEE CAMP LOCATION IN SOUTH SUDAN ..... 32

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CMAM | Community Management of Acute Malnutrition |
| CSB | Corn-Soya Blend |
| ENA | Emergency Nutrition Assessment |
| EPI | Expanded Programme on Immunization |
| Epi Info | Name of CDC software for epidemiological investigations |
| GAM | Global Acute Malnutrition |
| GFR | General Food Ration |
| GFD | General Food Distribution |
| HAZ | Height-for-Age z-score |
| HH | Household |
| HIS | Health Information System |
| IYCF | Infant and Young Child Feeding |
| KCAL | Kilocalorie |
| MAM | Moderate Acute Malnutrition |
| MOH | Ministry of Health |
| MUAC | Middle Upper Arm circumference |
| NCHS | National Centre for Health Statistics |
| OTP | Out-patient Therapeutic Programme |
| ProGres | UNHCR registration database for refugees |
| SAM | Severe Acute Malnutrition |
| SC | Stabilization Centre |
| SD | Standard Deviation |
| SFP | Supplementary Feeding Programme |
| SMART | Standardised Monitoring & Assessment of Relief & Transitions |
| TFP | Therapeutic Feeding Programme |
| UNHCR | United Nations High Commissioner for Refugees |
| UNICEF | United Nations Children's Funds |
| WASH | Water Sanitation and Hygiene |
| WAZ | Weight-for-Age z-score |
| WFH | Weight-for-height |
| WHZ | Weight-for-Height z-score |
| WFP | World Food Programme |
| WHO | World Health Organization |

## ACKNOWLEDGMENTS

We gratefully acknowledge the important contributions made by so many that made this survey possible.

Firstly we would like to acknowledge the UNHCR Juba and Yambio offices for the operational support that made the planning, training and field work possible and the UNHCR Senior Management for general guidance and oversight.

Secondly sincere appreciation is extended to World Vision for planning the field level logistics and for providing staff during the entire duration of the exercise. Our gratitude also goes to WFP and UNICEF for supporting the training.

Finally, we sincerely thank the refugee population who gave up their time to participate and allowed us to measure their children and, most importantly, to the children themselves. A complete list of key individuals involved can be found at **Appendix 1**.

## EXECUTIVE SUMMARY

The survey results showed a prevalence of global acute malnutrition of 3.3% (1.5-7.4 95% C.I.). This indicates that the nutrition situation in the Makpandu settlement ranges between acceptable to poor according to WHO classification. Prevalence of stunting or chronic malnutrition among children aged 6-59 months was 33.6% which is classified as serious according to WHO classification. Maintenance of the comprehensive nutrition program, strengthening of preventative activities including the provision of adequate household food intake, promotion of appropriate Infant and Young Child Feeding (IYCF) and caring practices, health and sanitation at household level is recommended in 2018 to facilitate further reduction and the recurrence of malnutrition. This to be accomplished through food assistance, promotion and protection of IYCF practices, improved health services and the expansion of livelihood activities to prevent malnutrition in addition to the treatment of malnourished persons.

UNHCR and WVI carried out the rapid nutrition survey in Makpandu from 23 to 27 October 2017. This will serve as the baseline as it is the first nutrition survey to be conducted in Makpandu refugee settlement. The overall aim of the survey was to assess the nutrition situation among the refugee population and to monitor the progress of the current nutrition interventions.

A cross-sectional survey was conducted using simple random sampling. This was based on Makpandu being a relatively small settlement where households could be listed to provide an updated list. Houses were physically labelled /enumerated prior to the survey following a unique number per block and following the definition of the household. To reduce non-response rate and ensure results were representative of people actually living in the settlement at the time of the survey, empty households, as verified through neighbours were not be labelled and thus not included in the sampling frame. A random household sample was drawn from the actual number of physically verified household before the survey.

The sample size was calculated using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) software version July 9, 2015 following UNHCR SENS methodology. The GAM prevalence estimate was based on the likely scenario using the 2016 Mass MUAC screening results. The total population, percentage of under-5 and average household size was derived from the UNHCR ProGres data. A non-response rate of 5% was used in both camps as household listing was carried out right before the survey data collection. The parameters used to calculate the sample size can be found on page 12

A total of six survey teams composed of three members each was constituted for the survey. This included a team leader and two anthropometric measurers. A three day training was carried out. This included a day of standardization/pre-test. The survey teams were supported by a WVI supervisor on ground and remotely by the UNHCR coordinator throughout the duration of data collection. Data collection was carried out using paper questionnaires. The data was entered daily into ENA for SMART software (version July 9, 2015). Data analysis was undertaken using the ENA for SMART version July 9, 2015 and Epi Info 7softwares.

The summary results are as below

**Table 1:** Summary of results

| | 95% C.I. | Classification of public health significance / target (where applicable) |
|---|---|---|
| **CHILDREN (6-59 months)** | | |
| **No. of children surveyed** | 242 | |
| **Acute Malnutrition (N=241)** | | |
| Global Acute Malnutrition (GAM) (n=8) | 3.3 % (1.5 - 7.4) | Critical if ≥ 15% |
| Moderate Acute Malnutrition (MAM) (n=8) | 3.3 % (1.5 - 7.4) | |
| Severe Acute Malnutrition (SAM) | 0.0 | |
| Oedema | 0.0 | |
| **Stunting (N=241)** | | |
| Total Stunting (n=81) | 33.6 % (27.3 - 40.6) | Critical if ≥ 40% |
| Severe Stunting (n=24) | 10.0 % (6.6 - 14.8) | |
| **Mid Upper Arm Circumference (MUAC) (N=242)** | | |
| Prevalence of MUAC <125mm or oedema (n=8) | 3.3 % (1.9 - 5.7) | |
| Prevalence of MUAC < 125 mm and >= 115 mm, no oedema (n=8) | 3.3 % (1.9 - 5.7) | |
| Prevalence of MUAC < 115mm and/or oedema (n=0) | 0.0 | |
| **Programme coverage (6-59 months)** | | |
| Targeted supplementary feeding program (based on oedema and MUAC) (n=6/8) | 75% | |
| Measles vaccination with card (9-59 months) (n=148/229) | 64.6% (58.1-70.8) | |
| Measles vaccination with card or recall (9-59 months) (n=211/229) | 92.1% (87.7-95.3) | Target of ≥ 95% |
| Vitamin A supplementation coverage with card, within past 6 months (6-59 months) (n=36/242) | 14.9% (10.6-20.0) | |
| Vitamin A supplementation coverage with card or recall, within past 6 months (6-59 months)(n=216/242) | 89.3% (84.7-92.9) | Target of ≥ 90% |
| **Morbidity** | | |
| Diarrhoea in the past 2 weeks (n=59/241) | 24.5% (19.2-30.4) | |
| Proportion of children with diarrhoea who were taken to a health facility (n=45/59) | 76.3% (63.4-86.4) | |

## Interpretation

- The overall nutrition situation in Makpandu settlement is classified as bordering between acceptable and poor levels as GAM prevalence [3.3 (1.5-7.4 95% C.I.)] falls between 5-9%[1]. GAM prevalence of 3.3% is within the acceptable range of <5% but the higher confidence interval is 7.4% falls under poor nutrition status according to WHO classification.

- The prevalence of global stunting was 33.6% (27.3-40.6 95% C.I.). This indicates a serious level according to WHO classification and is above the acceptable standard of <20%. This should however be interpreted with caution due to the age estimation limitation. 24% of the children 6-59 months did not have a reliable age documentation.

- The coverage of Targeted Supplementary Feeding Program (TSFP) using MUAC did not meet the recommended standard of >90%. The coverage was 75%. This indicates the need to strengthen active case finding, referral and enrollment in nutrition programme through screening at the community level in Makpandu.

- The coverage of measles vaccination and vitamin A supplementation was slightly below the target coverage of ≥95% and ≥90% respectively indicating the need to strengthen and maintain both the routine and campaign vaccination/supplementation interventions.

- Almost a quarter of children 6-59 months reported to have had diarrhoea in the last two weeks prior to the survey indicating a high morbidity rate requiring continued health services provision, and strengthening of community based preventive interventions on hygine, sanitation and child care practices. Three quarter of these sort medical care at the Makpandu PHCC.

## Recommendations and priorities

### Nutrition related

Maintain a comprehensive Community based Management of Acute Malnutrition (CMAM) program providing both therapeutic and supplementary feeding programs to facilitate the rehabilitation of identified acute malnourished children, pregnant and lactating women, people living with HIV/AIDS and TB patients on treatment. This to include active case finding and community mobilization. (UNHCR, UNICEF, WFP and WVI).

Ensure all community screened and referred 6-59 months children identified with a MUAC less than 125mm get enrolled into the management of acute malnutrition programs through community outreach follow up at household level (WVI).

Maintain blanket supplementary feeding programme for children 6-23 months, pregnant and lactating women using a fortified blended food or lipid based supplement to prevent malnutrition and to cover the nutrient gap these vulnerable groups have in light of a predominant grain based general food diet (UNHCR, WFP and WVI).

Conduct a two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at the BSFP site and the PHCC triage area in Makpandu to ensure both high MUAC and WHZ score coverage (WVI).

[1] WHO 2000 categorisation

Continue strengthening the capacity of the established nutrition facility in terms of nutrition supplies and staff training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF and WVI).

Strengthen the prevention of malnutrition components including IYCF and community outreach education aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF and WVI).

Conduct follow up quarterly mass MUAC screening to monitor the evolution of the nutrition situation in Makpandu settlement. (WVI).

Ensure regular monitoring and supervision, quarterly joint monitoring and yearly program perfomance evaluations in Makpandu to assess performance progress and formulate recommendations for any identified gaps. (UNHCR, WFP, UNICEF and WVI).

Undertake a follow up annual nutrition survey to analyze trends and facilitate program impact evaluation. (UNHCR, WVI, WFP and UNICEF).

### Food security related

General food ration providing the minimum dietary requirements (2100kcal/person/day) is critical to ensure basic nutrition provision. Currently the ration provided in Makpandu settlement only provides 1491 kcal/p/d (71%) of the recommended calories which is insufficient in a population that predominantly relies on the general food ration. In addition to this prepositioning of 2018 supplies to be carried out at the beginning of the year to avoid pipeline breaks (UNHCR, WVI and WFP).

Continue the routine joint monthly food basket monitoring on site and beneficiary contact monitoring at the household level in Makpandu settlement to ensure that refugees receive their entitlement (UNHCR, WVI and WFP).

Expand the coverage of sustainable food security and livelihood solutions in in Makpandu settlement to complement the general food distribution (UNHCR, WFP and WVI).

### Health related

Maintain and strengthen the provision of comprehensive primary health care programme for refugees and host populations in Yambio. (UNHCR and WVI)

UNICEF, WVI and UNHCR to ensure the Expanded Programme on Immunization (EPI) and Vitamin A supplementation campaigns and routine programmes are maintained and strengthened to increase coverage to acceptable standards.

Adequate clean water provision to be maintained in 2018. In addition to this hygiene promotion and latrine coverage strengthening to reduce the diarrhoea caseload to be ensured. (UNHCR and WVI)

# INTRODUCTION

This report presents the results of rapid nutrition survey conducted in Makpandu settlement. The survey was carried out from 23 to 27 October 2017.
This report is divided into the following sections:

- *Background:* This section sets out background information related to the health, nutrition and food security situation for Makpandu settlement;
- *Methodology;*
- *Results:* presents the findings;
- *Discussion; and*
- *Recommendations.*

## Background

Makpandu refugee settlement has an estimated refugee population of 3724[2] who are mainly from DRC and CAR, and a few from Sudan and Eritrea.

Key partners in terms of the provision of the health, nutrition and food security services include UNHCR, WFP, UNICEF and World Vision International (WVI). UNHCR is mainly involved in coordinating services offered to the refugees through the partners. WFP's main role is to ensure that the refugee's food security is adequately addressed through the provision of the general food ration (GFR) once per month. In addition to this WFP supports the supplementary feeding program targeting vulnerable groups. UNICEF in collaboration with UNHCR provides support to the management of severe acute malnutrition and IYCF programmes. WVI implements the health, nutrition and food security programme.

### *Food Security*

Refugees in the Makpandu settlement are mainly dependant on the WFP provided General Food Ration (GFR) and have limited access to additional sources of food/income. The 29% reduced GFR without fortified flour (CSB+) and salt provided to all registered refugees remained the same from January to October 2017. It consisted of 350g sorghum, 35g of yellow split peas and 21ml of vegetable oil. This cumulates to approximately 406 grams/person/day providing 1491 kilocalories/person/day. This provided 71% of the recommended food ration of 2100 kcal/person/day. There was a pipeline break in May and September 2017.

See breakdown below showing the monthly ration provision.

[2] UNHCR ProGres October 2017 population

**Table 2** General food ration provision by month – Makpandu refugee settlement, Yambio, 2017

| Ration provided at the distribution in g/p/d | Standard | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Cereal* | 500g | 350 | 350 | 350 | 350 | 0 | 350 | 350 | 350 | 175 | 350 | 315 |
| *Pulses* | 50g | 35 | 35 | 35 | 35 | 0 | 35 | 35 | 35 | 18 | 35 | 31.5 |
| *Vegetable oil* | 30g | 21 | 21 | 21 | 21 | 0 | 21 | 21 | 21 | 10 | 21 | 18.9 |
| *Salt* | 5g | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *CSB+* | 50g | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Kcal* | 2100 | 1491 | 1491 | 1491 | 1491 | 0 | 1491 | 1491 | 1491 | 743 | 1491 | 1342 |
| | % of standard met | 71 | 71 | 71 | 71 | 0 | 71 | 71 | 71 | 35 | 71 | 64 |

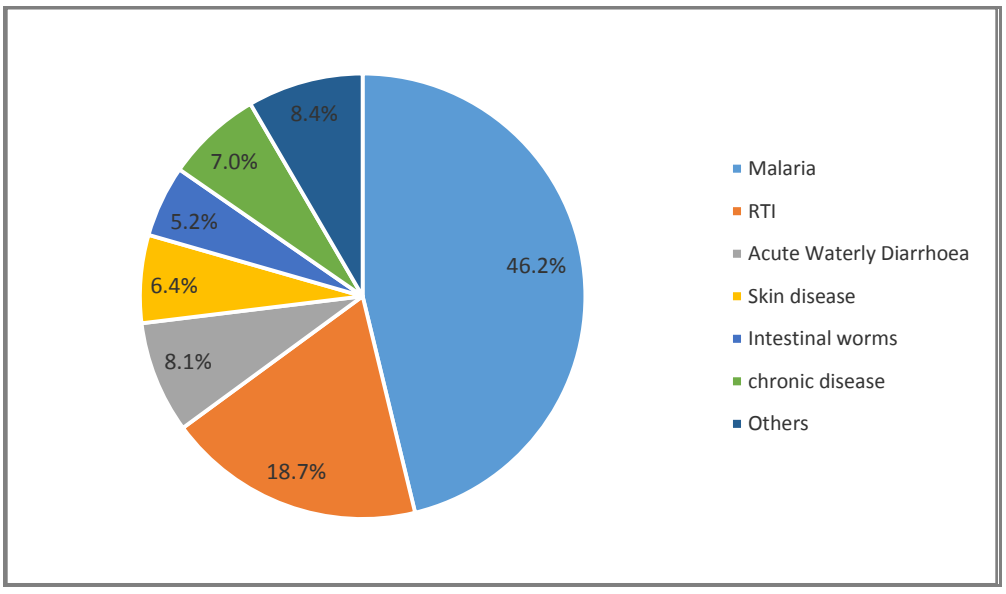
### *Health situation*

Makpandu refugee settlement has one Primary Health Care Centre (PHCC).

The overall crude mortality rate for Makpandu settlement from the UNHCR Health Information System (HIS) from January to October 2017 was 0.07/10000/day while under-five mortality rate was 0.1/10000/day which was below the emergency threshold of <0.75 and <2 respectively. This indicates a stable population.

The main causes of illness in 2017 were malaria, respiratory tract infections, watery diarrhoea, skin disease and intestinal worms.

**Figure 1:** Under-five proportional morbidity from January to October 2017; Makpandu, Yambio settlements (UNHCR HIS)



*Nutrition Situation*

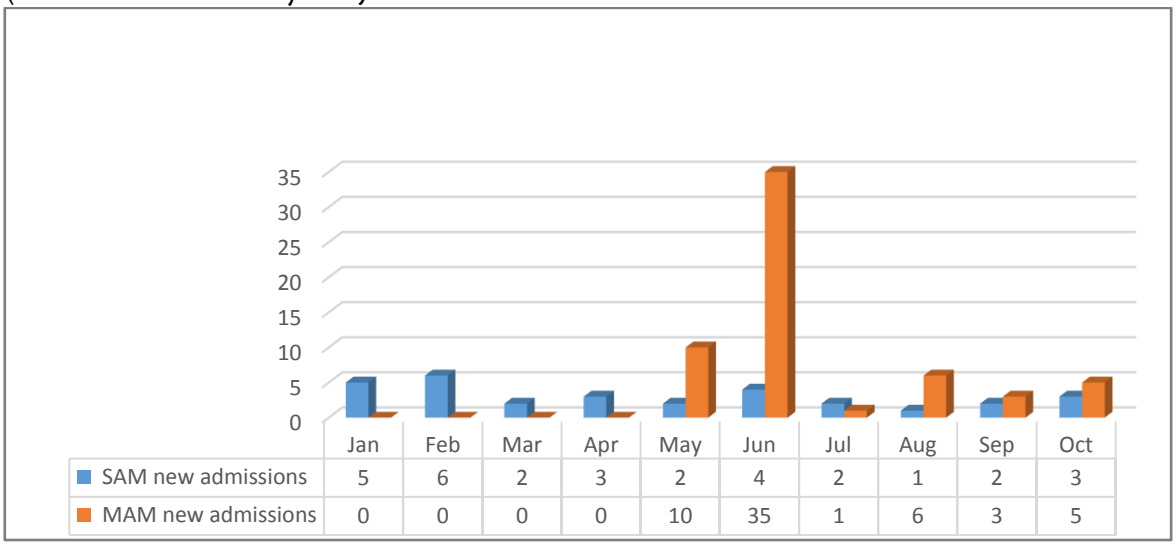
Health data from Makpandu refugee settlement traditionally reported low malnutrition cases. In 2016 however the MUAC screening data at the health facilities indicated a rising trend in the second half of the year. This prompted the need for further investigation. Results from a Mass MUAC screening carried out at the end of the year showed a proportion of 7.2% children 6-59 months were malnourished (had a MUAC <12.5cm) indicating a poor nutrition status. This prompted the set up of a nutrition program to rehabilitate identified acute malnourished cases.

Nutrition services and activities in the settlement at the time of the survey included:

- Targeted Supplementary Feeding Programmes (TSFP) for moderately acute malnourished cases using PlumpySup or CSB++
- Outpatient Therapeutic feeding Program (OTP) for severely acute malnourished children. Severe acute malnourished cases with major medical complications were referred to the Yambio hospital.
- Blanket Supplementary Feeding Program (BSFP) using CSB++
- Basic Infant and young child feeding support and promotion programme.
- Community outreach MUAC screening.

From January to September 2017 there were 82 (children aged 6-59) admissions of which 27 were admitted to the OTP and 55 to the TSFP. At the end of September 2017 there were 27 children aged 6-59 months enrolled in both the OTP and TSFP program. There was an additional 37 children enrolled admissions from the host community.

**Figure 2:** Admissions to the selective feeding program (OTP & TSFP) January- October 2017 (Health Information System)




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct |
|---|---|---|---|---|---|---|---|---|---|---|
| SAM new admissions | 5 | 6 | 2 | 3 | 2 | 4 | 2 | 1 | 2 | 3 |
| MAM new admissions | 0 | 0 | 0 | 0 | 10 | 35 | 1 | 6 | 3 | 5 |

The peak in May –June is likely to have been attributed to the pipeline break in the General Food Distribution (GFD). Refugees in Makpandu did not receive any food assistance in May 2017. The next GFD was provided between 12 and 14 June 2017.

### *WASH situation*

Access to water in Makpandu in 2017 was maintained through 13 water points (12 boreholes fitted with India Mark II pumps and 1 submersible pump fixed with an 8,000 litres capacity elevated water tank. Routine water quality management (testing and chlorination of boreholes) and their maintenance was also carried out regularly. An average of 19.2 litres per person per day was available in 2017 which meets the minimum SPHERE standard but is lower than the UNHCR standard of ≥ liters per person per day. The population in Makpandu will continue to require the water to be maintained within the minimum standards.

At the end of 2017, Makpandu settlement had 416 functional facilities (404 household pit latrines and 12 public/institutional Ventrated Improved Pit (VIP) latrine) serving 1,155 households. This number needs to be increased to ensure there is no open defecation in Makpandu settlement and to reduce the disease burden.

## SURVEY OBJECTIVES

Specific primary objectives of the survey:

*a.* To determine the prevalence of acute malnutrition among children 6-59 months;
*b.* To determine the prevalence of stunting among children 6-59 months;
*c.* To assess the two-week period prevalence of diarrhoea among children 6-59 months;
d. To determine the coverage of measles vaccination among children 9-59 months;
e. To determine the coverage of vitamin A supplementation in the last six months among children 6-59 months;
f. To establish recommendations on actions to be taken to address the situation; and
g. To determine the coverage of targeted supplementary and therapeutic feeding programmes for children aged 6-59 months.

## METHODOLOGY

### Survey population and sample size

The sample size was calculated using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) software version July 9, 2015 following UNHCR SENS methodology. The GAM prevalence estimate was based on the likely scenario using the 2016 Mass MUAC screening results. The total population, percentage of under-5 and average household size was derived from the UNHCR ProGres data. A non-response rate of 5% was used in both camps as household listing was carried out right before the survey data collection.

Parameter used to calculate the sample size

| Location | Makpandu |
|---|---|
| Total camp population ( UNHCR ProGres September 2017 | 3670 |
| % population under 5 | 16.6 |
| Estimated GAM prevalence (%) | 10 |
| ± Desired Precision (%) | 3 |
| Non response rate (%) | 5 |
| Average household size | 3.4 |
| Number of Children (ENA) | 226 |
| Household target for Anthropometry and Health module (ENA for SMART)including non-response rate | 469 |

As the population of children under five was less than 10,000 a correction factor was used while cacluating the sample size.

Sampling procedure: selecting households and individuals

A cross-sectional survey was conducted using simple random sampling. This was based on Makpandu being a relatively small settlement where households could be listed to provide an updated list. Houses were physically labelled /enumerated prior to the survey following a unique number per block and following the definition of the household. To reduce non-response rate and ensure results were representative of people actually living in the settlement at the time of the survey, empty households, as verified through neighbours were not be labelled and thus not included in the sampling frame. A random household sample was drawn from the actual number of physically verified household before the survey.

House hold questionnaire administration

All households with children 6-59 months were surveyed. Each team was allocated a block to survey. Block locations and boundaries was discussed during the training to ensure all teams knew where to go.

If an individual or an entire household was absent the teams were instructed to return to the household or revisit the absent individual one more time. If they were unsuccessful after this, the individual or the household was recorded as absent and they were not replaced with another individual.

If the individual or an entire household refused to participate then it was considered a refusal and the individual or the household were not replaced with another.

If a selected child was living with a disability or a physical deformity preventing certain anthropometric measurements the child was still included in the assessment of the other indicators

If it was determined that a selected household did not have any eligible children, the questionnaire was not administered and the team moved to the next household.

## Questionnaires

Paper questionnaires were used for data collection. See **Appendix 3**

The questionnaires were prepared in English language. Following the survey training/pilot, revisions were adapted. The questionnaires were translated to the local dialect via the enumerators where necessary during data collection.

The anthropometric module questionnaire (adapted from UNHCR SENS Guidelines version 2, 2013) was administered targeting children 6-59 months. This included questions and measures for children aged 6-59 months. Information was collected on anthropometric status, oedema, enrolment in selective feeding programmes, immunisation (measles), vitamin A supplementation in the last six months, if the child had diarhoea two week's prior to the survey and if they did whether they visited the health centre. Either an EPI card or child health card were used to determine the age in case there was no birth certificate. If no reliable proof of age was available, age was estimated in months using a local event calendar and was recorded in months on the questionnaire. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was used for inclusion; the child had to measure between 65 cm and 110 cm.

***Weight of children 6-59 months:*** measurements were taken to the closest 100 grams using an electronic scale (SECA scale). All children were weighed without clothes.

***Height/Length of children 6-59 months:*** children's height or length was taken to the closest millimetre using a wooden height board (Shorr Productions). Height was used to decide on whether a child should be measured lying down (length) or standing up (height). Children less than 87cm were measured lying down, while those greater than or equal to 87cm were measured standing up.

***Oedema in children 6-59 months:*** bilateral oedema was assessed by applying gentle thumb pressure on to the tops of both feet of the child for a period of three seconds and thereafter observing for the presence or absence of an indent.

***MUAC of children 6-59 months:*** MUAC was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimetre using a standard tape. MUAC was recorded in millimetres.

***Child enrolment in selective feeding programme for children 6-59 months:*** selective feeding programme coverage was assessed for the outpatient therapeutic programme and for the supplementary feeding programme.This was verified by card or by showing images of the products given at the different programs

***Measles vaccination in children 6-59 months:*** measles vaccination was assessed by checking for the measles vaccine on the EPI card if available or by asking the caregiver to recall if no EPI card was available. For ease of data collection, results were recorded on all children but were only analysed for children aged 9-59 months

***Vitamin A supplementation in last 6 months in children 6-59 months:*** whether the child received a vitamin A capsule over the past six months was recorded from the EPI card or health card if available or by asking the caregiver to recall if no card is available. A vitamin A capsule image was shown to the caregiver when asked to recall.

***Diarrhoea in last 2 weeks in children 6-59 months:*** Caregivers were asked if their child had suffered of any illness in the past two weeks.

*Health seeking behavior: for children that were ill*, whether the caregiver took the child to the health centre for treatment.

*Referrals:* Children aged 6-59 months were referred to nutrition center for treatment when MUAC was < 12.5 cm, WHZ<-2 z-score or oedema was present.

### Case definitions, inclusion criteria and calculations

*Malnutrition in children 6-59 months:* Acute malnutrition was defined using weight-for-height index values or the presence of oedema and classified as show in the table below. Main results are reported after analysis using the WHO 2006 Growth Standards.

Stunting, also known as chronic malnutrition was defined using height-for-age index values and was classified as severe or moderate based on the cut-offs shown below. Main results are reported according to the WHO Growth Standards 2006.

**Table 4:** Definitions of stunting using height-for-age in children 6–59 months

| Categories of stunting | Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977) |
|---|---|
| Stunting | <-2 z-scores |
| Moderate stunting | <-2 z-score and >=-3 z-score |
| Severe stunting | <-3 z-scores |

Underweight was defined using the weight-for-age index values and was classified as severe or moderate based on the following cut-offs. Main results are reported according to the WHO Growth Standards 2006.

**Table 5:** Definitions of underweight using weight-for-age in children 6–59 months

| Categories of underweight | Z-scores (WHO Growth Standards 2006 and NCHS Growth Reference 1977) |
|---|---|
| Underweight | <-2 z-scores |
| Moderate underweight | <-2 z-scores and >=-3 z-scores |
| Severe underweight | <-3 z-scores |

Mid Upper Arm Circumference (MUAC) values were used to define malnutrition according to the following cut-offs in children 6-59 months:

**Table 6:** MUAC malnutrition cut-offs in children 6-59 months

| Categories of MUAC values |
|---|
| <125 mm |
| ≥ 115 mm and <125 mm |
| < 115 mm |

*Child enrolment in selective feeding programme for children 6-59 months:* Feeding programme coverage is estimated during the nutrition survey using the direct method as follows (reference: Emergency Nutrition Assessment: Guidelines for field workers. (Save the Children 2004):

Targeted supplementary feeding programme

Coverage of TSFP programme (%) =
100 x No. of surveyed children with MAM according to SFP admission criteria who reported being registered in SFP/ No. of surveyed children with MAM *according to SFP admission criteria*

Therapeutic feeding programme

Coverage of OTP programme (%) =
100x No. of surveyed children with SAM according to OTP admission criteria who reported being registered in OTP/ No. of surveyed children with SAM according to OTP admission criteria

## Classification of public health problems and targets

***Anthropometric data:*** UNHCR states that the target for the prevalence of global acute malnutrition (GAM) for children 6-59 months of age by camp, country and region should be <10% and the target for the prevalence of severe acute malnutrition (SAM) should be <2%. For stable camps, the target is to have GAM<5%.

The table below shows the classification of public health significance of the anthropometric results for children under-5 years of age.

**Table 7:** Classification of public health significance for children under 5 years of age

| Prevalence % | Critical | Serious | Poor | Acceptable |
|---|---|---|---|---|
| Low weight-for-height | ≥15 | 10-14 | 5-9 | <5 |
| Low height-for-age | ≥40 | 30-39 | 20-29 | <20 |
| Low weight-for-age | ≥30 | 20-29 | 10-19 | <10 |

*Selective feeding programmes:*

UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 includes the following indicators. The table below shows the targeted performance indicators for malnutrition treatment programmes according to UNHCR Strategic Plan for Nutrition and Food Security 2008-2012 (same as Sphere Standards).

**Table 8:** Performance indicators for selective feeding programmes (UNHCR Strategic Plan for Nutrition and Food Security 2008-2012)*

| | | | | Coverage | | |
|---|---|---|---|---|---|---|
| | Recovery | Case fatality | Defaulter rate | Rural areas | Urban areas | Refugee camps /settlements |
| SFP | >75% | <3% | <15% | >50% | >70% | >90% |
| TFP | >75% | <10% | <15% | >50% | >70% | >90% |

* Also meet SPHERE standards for performance

*Measles vaccination coverage:* UNHCR recommends target coverage of ≥95% (same as Sphere Standards).

*Vitamin A supplementation coverage:* UNHCR Strategic Plan for Nutrition and Food Security (2008-2012) states that the target for vitamin A supplementation coverage for children aged 6-59 months by settlement, country and region should be ≥90%.

### Training, coordination and supervision

The surveys were coordinated by UNHCR Juba and Yambio offices in collaboration with the WVI team including Godfrey Otobi, Henry Ilunga, Richman Lollis and Joyce Mondi.

The surveys were undertaken by six teams. Each team was composed of three members: one team leader/questionnaire enumerator and two anthropometric measurers. The team leaders/questionnaire enumerators were qualified health/nutrition staff, while the anthropometric measurers were home health promoters.

A three day training was carried out from 17 to 19 October 2017. UNICEF and WFP also supported the training. The training focused on: the purpose and objectives of the survey, roles and responsibilities of each team member, familiarization with the questionnaires by reviewing the purpose of each question; interviewing skills and recording of data; interpretation of calendar of events and age determination; how to take anthropometric measurements, common errors and data recording. A standardisation exercise on anthropometric measurements was also carried out for practice as well as a pilot test. Post the training the data collection tools were then reviewed based on the feedback from the team

### Data collection, entry and analysis

Data collection lasted for 5 days days from 23 to 27 October 2017 2017. Each survey team explained the purpose of the survey and issues of confidentiality and obtained verbal consent before proceeding with the survey in the selected households. The informed consent form is shown in **Appendix 3**. The survey teams were supported by a WVI supervisor on ground and coordinated remotely by the UNHCR Nutrition and Food Security Officer throughout the duration of data collection. Data collection was carried out using paper questionnaires. The data was entered daily into ENA for SMART software (version July 9, 2015). A plausibility check was generated thereafter for the provision of daily feedback to the supervisor and onward to the team leaders. Records with queries were marked and returned to the team for correction and/or confirmation the following day.

At the end of the data collection, a complete set of data was ready. All data files were cleaned before analysis. Entries were double checked, one by one, with the original questionnaire to ensure there were no data entry errors. Analysis was performed using ENA for SMART and Epi Info software. The SMART plausibility report was generated in order to check the quality of the anthropometric data and a summary of the key quality criteria is shown in **Appendix 2**.

The nutritional indices were cleaned using flexible cleaning criteria from the observed mean (also known as SMART flags in the ENA for SMART software), rather than the reference mean (also known as WHO flags in the ENA for SMART software). This flexible cleaning approach is recommended in the UNHCR SENS Guidelines (Version 2, 2013) in accordance with SMART recommendations. For the weight-for-height index, a cleaning window of +/- 3 SD value contained in the SMART for ENA software was used.

## RESULTS FROM MAKPANDU

### CHILDREN 6-59 MONTHS INDICATORS, MAKPANDU SETTLEMENT, YAMBIO (October 2017)

Table 9 shows the different population groups and the total number of individuals who were sampled within each group.

**Table 9:** Actual number of children captured during the survey Makpandu settlement versus the UNHCR Progress population target, (October 2017)

| Target group | Target population | Subjects measured/interviewed during the survey | % of the target |
|---|---|---|---|
| Children 6-59 months | 226 | 242 | 107.1% |

The targeted number of the children to be surveyed was met. The coverage was also higher than expected. This could be due to the likelihood of the average household size being bigger using the survey definition as compared to the UNHCR ProGres data.

#### Anthropometric results (based on WHO Growth Standards 2006)

The coverage of age documentation was 76% (children having an exact birth date). As this does not include all children the stunting and the underweight data should be interpreted with caution.

**Table 10:** Distribution of age and sex of sample-Makpandu settlement, Yambio (October 2017)

| | Boys | | Girls | | Total | | Ratio |
|---|---|---|---|---|---|---|---|
| AGE (mo) | no. | % | no. | % | no. | % | Boy:girl |
| 6-17 | 25 | 43.9 | 32 | 56.1 | 57 | 23.6 | 0.8 |
| 18-29 | 31 | 50.8 | 30 | 49.2 | 61 | 25.2 | 1.0 |
| 30-41 | 28 | 46.7 | 32 | 53.3 | 60 | 24.8 | 0.9 |
| 42-53 | 20 | 42.6 | 27 | 57.4 | 47 | 19.4 | 0.7 |
| 54-59 | 13 | 76.5 | 4 | 23.5 | 17 | 7.0 | 3.3 |
| Total | 117 | 48.3 | 125 | 51.7 | 242 | 100.0 | 0.9 |

The overall sex ratio was 0.9 (sex ratio should be between 0.8-1.2), which confirms that both sexes were equally distributed.

**Table 11:** Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex- Makpandu settlement, Yambio (October 2017)

| | All<br>n = 241 | Boys<br>n = 116 | Girls<br>n = 125 |
|---|---|---|---|
| Prevalence of global malnutrition (<-2 z-score and/or oedema) | (8) 3.3 % (1.5 - 7.4 95% C.I.) | (4) 3.4 % (1.3 - 8.6 95% C.I.) | (4) 3.2 % (1.2 - 8.2 95% C.I.) |
| Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema) | (8) 3.3 % (1.5 - 7.4 95% C.I.) | (4) 3.4 % (1.3 - 8.6 95% C.I.) | (4) 3.2 % (1.2 - 8.2 95% C.I.) |
| Prevalence of severe malnutrition (<-3 z-score and/or oedema) | (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.) |

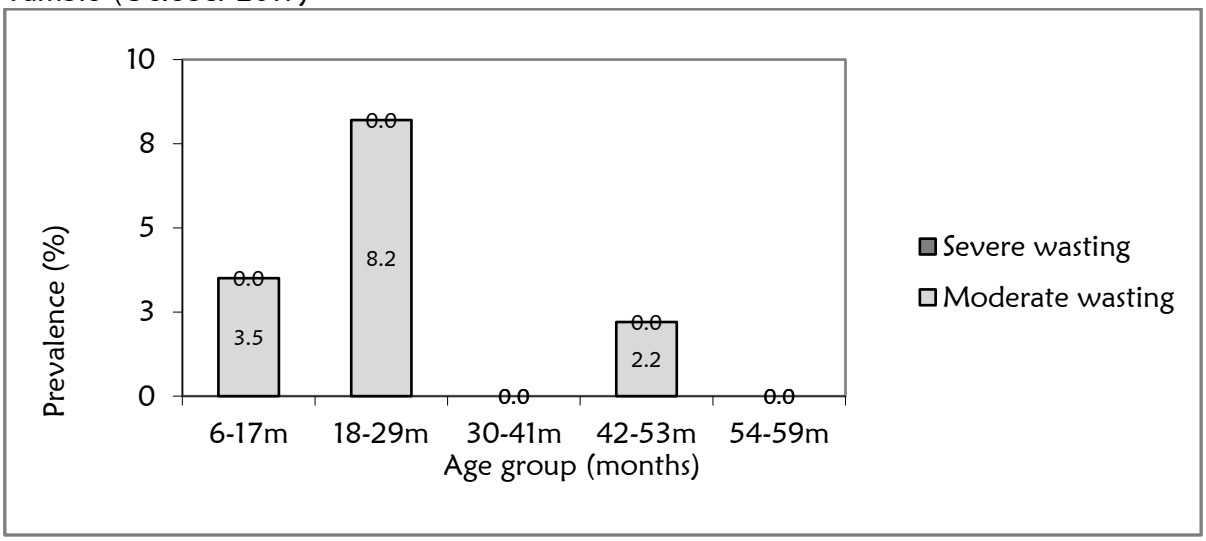
The prevalence of oedema is 0.0%. Data excludes SMART flags

There was no difference between boys and girls in the prevalence of acute malnutrition (p>0.05).

**Table 12:** Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema- Makpandu settlement, Yambio (October 2017)

| | | Severe wasting (<-3 z-score) | | Moderate wasting (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | | Oedema | |
|---|---|---|---|---|---|---|---|---|---|
| Age (mo) | Total no. | No. | % | No. | % | No. | % | No. | % |
| 6-17 | 57 | 0 | 0.0 | 2 | 3.5 | 55 | 96.5 | 0 | 0.0 |
| 18-29 | 61 | 0 | 0.0 | 5 | 8.2 | 56 | 91.8 | 0 | 0.0 |
| 30-41 | 60 | 0 | 0.0 | 0 | 0.0 | 60 | 100.0 | 0 | 0.0 |
| 42-53 | 46 | 0 | 0.0 | 1 | 2.2 | 45 | 97.8 | 0 | 0.0 |
| 54-59 | 17 | 0 | 0.0 | 0 | 0.0 | 17 | 100.0 | 0 | 0.0 |
| Total | 241 | 0 | 0.0 | 8 | 3.3 | 233 | 96.7 | 0 | 0.0 |

**Figure 3:** Prevalence of wasting by age in children 6-59 months- Makpandu settlement, Yambio (October 2017)



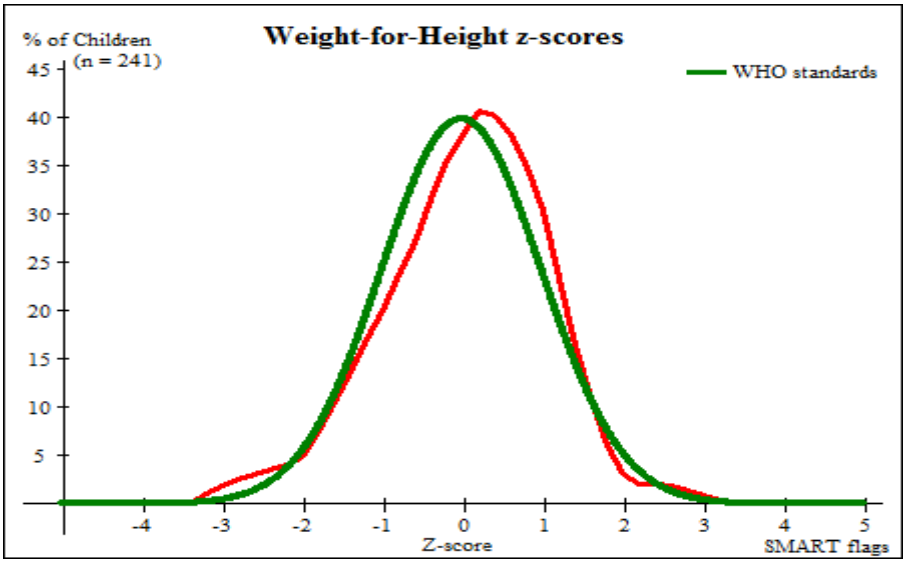

Children in the younger age group 6-17 and 18-29 months tend to be most affected by wasting in Makpandu settlement.

**Table 13:** Distribution of severe acute malnutrition and oedema based on weight-for-height z-scores- Makpandu settlement, Yambio (October 2017)

| | <-3 z-score* | >=-3 z-score |
|---|---|---|
| Oedema present | Marasmic kwashiorkor<br>No. 0<br>(0.0 %) | Kwashiorkor<br>No. 0<br>(0.0 %) |
| Oedema absent | Marasmic<br>No. 1<br>(0.4 %) | Not severely malnourished<br>No. 241<br>(99.6 %) |

**Includes Flags*

**Figure 4:** Distribution of weight-for-height z-scores (based on WHO Growth Standards; the reference population is shown in green) of survey population compared to reference population-Makpandu settlement, Yambio (October 2017)




The figure shows that malnutrition is not generalized in the population as the weight-for-height z-score distribution is mostly not shifted to the left. However there are pockets of malnutrition that need to be addressed

**Table 14:** Prevalence of stunting based on height-for-age z-scores and by sex- Makpandu settlement, Yambio (October 2017)

| | All<br>n = 241 | Boys<br>n = 116 | Girls<br>n = 125 |
|---|---|---|---|
| Prevalence of stunting (<-2 z-score) | (81) 33.6 %<br>(27.3 - 40.6<br>95% C.I.) | (44) 37.9 %<br>(29.3 - 47.4<br>95% C.I.) | (37) 29.6 %<br>(20.9 - 40.0<br>95% C.I.) |
| Prevalence of moderate stunting (<-2 z-score and >=-3 z-score) | (57) 23.7 %<br>(20.6 - 27.0<br>95% C.I.) | (28) 24.1 %<br>(19.8 - 29.1<br>95% C.I.) | (29) 23.2 %<br>(18.7 - 28.4<br>95% C.I.) |
| Prevalence of severe stunting (<-3 z-score) | (24) 10.0 %<br>(6.6 - 14.8<br>95% C.I.) | (16) 13.8 %<br>(8.5 - 21.6<br>95% C.I.) | (8) 6.4 %<br>(2.0 - 18.8<br>95% C.I.) |

**Table 15:** Prevalence of stunting by age based on height-for-age z-scores- Makpandu settlement, Yambio (October 2017)

| | | Severe stunting (<-3 z-score) | | Moderate stunting (>= -3 and <-2 z-score ) | | Normal (> = -2 z score) | |
|---|---|---|---|---|---|---|---|
| Age (mo) | Total no. | No. | % | No. | % | No. | % |
| 6-17 | 57 | 4 | 7.0 | 11 | 19.3 | 42 | 73.7 |
| 18-29 | 61 | 9 | 14.8 | 21 | 34.4 | 31 | 50.8 |
| 30-41 | 60 | 8 | 13.3 | 12 | 20.0 | 40 | 66.7 |
| 42-53 | 46 | 1 | 2.2 | 8 | 17.4 | 37 | 80.4 |
| 54-59 | 17 | 2 | 11.8 | 5 | 29.4 | 10 | 58.8 |
| Total | 241 | 24 | 10.0 | 57 | 23.7 | 160 | 66.4 |

Children in the age groups 18-29, 30-41 and 54-59 months tend to be the most affected by stunting as compared to the other age groups.

**Figure 5:** Prevalence of stunting by age in children 6-59 months- Makpandu settlement, Yambio (October 2017)

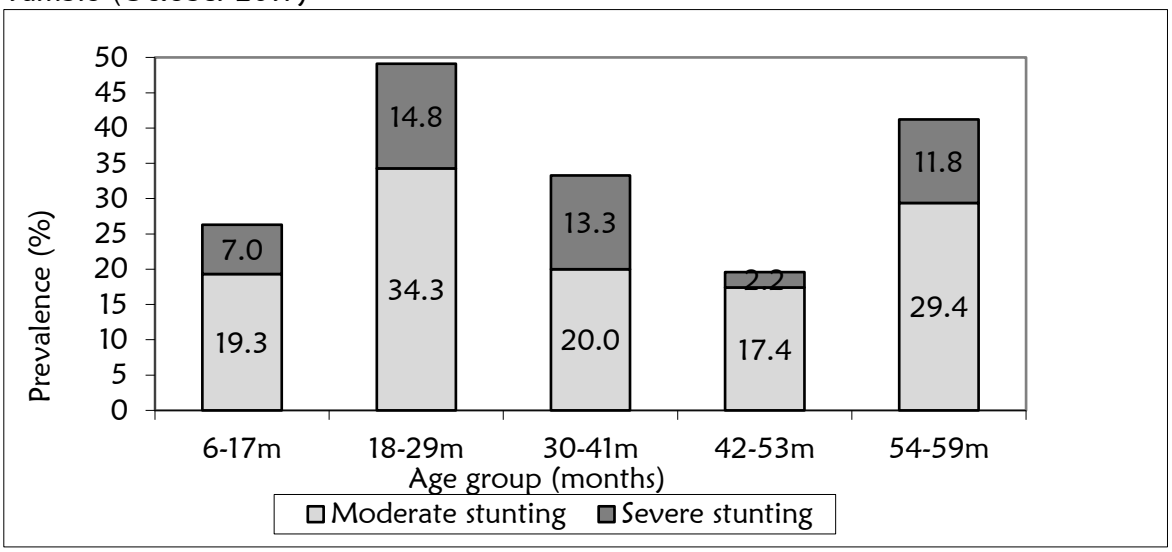



**Table 16:** Prevalence of underweight based on weight-for-age z-scores by sex- Makpandu settlement, Yambio (October 2017)

| | **All** n = 241 | **Boys** n = 116 | **Girls** n = 125 |
|---|---|---|---|
| **Prevalence of underweight (<-2 z-score)** | (26) 10.8 % (5.2 - 21.1 95% C.I.) | (14) 12.1 % (5.7 - 23.8 95% C.I.) | (12) 9.6 % (3.4 - 24.5 95% C.I.) |
| **Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)** | (21) 8.7 % (4.0 - 17.9 95% C.I.) | (11) 9.5 % (4.2 - 20.2 95% C.I.) | (10) 8.0 % (2.5 - 22.6 95% C.I.) |
| **Prevalence of severe underweight (<-3 z-score)** | (5) 2.1 % (1.0 - 4.4 95% C.I.) | (3) 2.6 % (0.8 - 7.9 95% C.I.) | (2) 1.6 % (0.5 - 5.1 95% C.I.) |

**Table 17:** Mean z-scores and excluded subjects - Makpandu settlement, Yambio (October 2017)

| Indicator | n | Mean z-scores ± SD | z-scores not available* | z-scores out of range |
|---|---|---|---|---|
| **Weight-for-Height** | 241 | 0.03±1.00 | 1.00 | 0 |
| **Weight-for-Age** | 241 | -0.76±0.96 | 2.22 | 0 |
| **Height-for-Age** | 241 | -1.42±1.24 | 1.00 | 0 |

MUAC was used in the community for screening and admission to therapeutic and supplementary feeding programmes.

**Table 18:** Prevalence of MUAC malnutrition- Makpandu settlement, Yambio (October 2017)

| | All<br>n = 242 | Boys<br>n = 117 | Girls<br>n = 125 |
|---|---|---|---|
| **Prevalence of MUAC (< 125 mm and/or oedema)** | (8) 3.3 %<br>(1.9 - 5.7<br>95% C.I.) | (1) 0.9 %<br>(0.1 - 9.7<br>95% C.I.) | (7) 5.6 %<br>(2.8 - 11.1<br>95% C.I.) |
| **Prevalence of MUAC (< 125 mm and >= 115 mm, no oedema)** | (8) 3.3 %<br>(1.9 - 5.7<br>95% C.I.) | (1) 0.9 %<br>(0.1 - 9.7<br>95% C.I.) | (7) 5.6 %<br>(2.8 - 11.1<br>95% C.I.) |
| **Prevalence of MUAC (< 115 mm and/or oedema)** | (0) 0.0 %<br>(0.0 - 0.0<br>95% C.I.) | (0) 0.0 %<br>(0.0 - 0.0<br>95% C.I.) | (0) 0.0 %<br>(0.0 - 0.0<br>95% C.I.) |

The case load for the selective feeding programmes was estimated to aid in programme planning. The Makpandu settlement total population as of October 2017 was 3724. 624 of this was the under 5 population. 562 of these was children aged 6-59 months (assuming that 10% of under-5 are infants 0-5 months). The TFP and TSFP target children aged 6-59 months.

**Table 19:** Estimated number of malnourished children aged 6-59 months eligible to be enrolled in a selective feeding programme at the time of the survey (based on all admission criteria)- Makpandu settlement, Yambio (October 2017)

| | Total/number | % | Estimate based on 565 6-59 population |
|---|---|---|---|
| **Eligible for therapeutic feeding programme**** | 0/242 | 0 | 0 |
| **Eligible for targeted supplementary feeding programme**** | 14/242 | 5.8 | 33 |

Using the HIS data for week 4 October 2017 there were 3 children enrolled in the therapeutic feeding program which was 0.5% of children 6-59 months while 27 were enrolled in the targeted supplementary feeding program which was 4.8% of children 6-59 months using the October population.

**Programme coverage**

**Selective feeding programme****

**Table 20:** Nutrition treatment programme coverage based on MUAC and oedema only- Makpandu settlement, Yambio (October 2017)

| | Number/total | % (95% CI) |
|---|---|---|
| **Proportion of children aged 6-59 months with severe acute malnutrition currently enrolled in therapeutic feeding programme** | 0/0 | - |
| **Proportion of children aged 6-59 months with moderate acute malnutrition currently enrolled in supplementary feeding programme** | 6/8 | 75% |

The enrollment coverage in selective feeding programme is below the expected target of >90%.

**Vaccination and supplementation programmes**

### Measles vaccination coverage

**Table 21:** Measles vaccination coverage for children aged 9-59 months (n= 229) - Makpandu settlement, Yambio (October 2017)

| | Measles (with card) n=148 | Measles (with card or confirmation from mother) N=211 |
|---|---|---|
| **YES** | 64.6% (58.1-70.8) | 92.1% (87.7-95.3) |

The measles vaccination coverage was slightly below the recommended standard target of ≥ 95%

### Vitamin A supplementation coverage

**Table 22:** Vitamin A supplementation for children aged 6-59 months within past 6 months (n=242) - Makpandu settlement, Yambio (October 2017)

| | Vitamin A capsule (with card) n=36 | Vitamin A capsule (with card or confirmation from mother) n=216 |
|---|---|---|
| **YES** | 14.9% (10.6-20.0) | 89.3% (84.7-92.9) |

The vitamin A coverage was slightly below the recommended standard target of ≥ 90%

### Morbidity

Almost a quarter of the children 6-59 months reported to have had diarrhoea two weeks prior to the survey. 76.3% (63.4-83.4 95% C.I) of these reported to have been taken to the health facility.

**Table 23: Prevalence of sickness in children 6-59 months**

| | Number/total | % |
|---|---|---|
| **Children had diarrhoea in the last two weeks (6-59 months)** | 59/241 | 24.4% (19.2-30.4 95% C.I) |

## LIMITATIONS

- There was restricted/limited access to Makpandu refugee settlements for UN staff during the survey period. This limited the number of modules that could be carried out as recommended in the UNHCR SENS guideline. To ascertain the nutrition situation in Makpandu settlement could thus be only carried out using a rapid nutrition survey.

- The age documentation coverage was 76%. Although an event calendar was used by the surveyors to ascertain age, stunting results need to be interpreted with caution because z-scores for height-for-age require accurate ages to within two weeks[3]

- Program coverage calculation using both Z score and MUAC admission criteria was thus not calculated. Coverage was assessed based on the community screening process practice where children with a MUAC of <12.5cm are referred for nutrition rehabilitation. The combined criteria will be included in the next survey once a mechanism of systematically screening children using both MUAC and WHZ <-2 z-scores is put in place.

## DISCUSSION

### Nutritional status of young children and mortality

The overall nutrition situation in Makpandu is classified as bordering between acceptable and poor as GAM prevalence [3.3 (1.5-7.4 95% C.I.)] falls between 5-9%[4]. 3.3% is within the acceptable range of <5% but the higher confidence interval is 7.4%, which falls under poor nutrition status according to WHO classification. The prevalence of severe acute malnutrition (SAM) was within the UNHCR acceptable level of <2%. The proportion of children 6-59 months that had a Mid Upper Arm Circurmfrence (MUAC) of <12.5cm in 2017 was 3.3%. This reduced compared to the 7.2% MUAC proportion in 2016 ($p<0.05$). The proportion of children that were eligible for admission that were based on both MUAC and WHZ scores was 5.7% indicating the need for a combined admission criteria. The low SAM prevalence can be attributed to the presence of an OTP program which rehabilitates any identified cases. OTP supplies were adequate through out the year. Targeted Supplementary Feeding in 2017 using PlumpySup- the recommended SFP product was initiated in 2017 to cater for the moderate malnourished cases. The supplies were however erratic leading to the use of CSB++ an alternative product in the absence of PlumpySup. Efforts to further reduce the moderate acute malnourished caseload needs to be sustained in 2018.

Stunting refers to a deficit in height relative to age due to a long-term process of linear growth retardation. The prevalence of global stunting was 33.6% (27.3-40.6 95% C.I.). This is above the WHO acceptable range of <20% and indicates a serious situation according to WHO classification. This should however be interpreted with caution due to the age estimation limitation. 24% of the surveyed children did not have a reliable age documentation. 'Stunting is a well-established risk marker of poor child development. Stunting before the age of 2 years predicts poorer cognitive and educational outcomes in later childhood and adolescence. Factors that contribute to stunted growth and development include poor maternal health and nutrition, inadequate infant and young child feeding practices, and infection.'[5] Action across multiple areas is necessary to reduce the

[3] (CDC/WFP: A manual: Measuring and Interpreting Mortality and Malnutrition, 2005).

[4] WHO 2000 categorisation

[5] WHA Global Nutrition Targets 2025: Stunting policy brief

stunting levels. This to include promotion of infant and young child feeding practices, ensuring adequate water and sanitation, infection control and maternal health and nutrition support.

## Morbidity and Health seeking behaviour

The interactions of nutrition and infection are cyclic with each exacerbating the other. Almost a quarter of children 6-59 months were reported to have had diarhoea in the last two weeks prior to the survey indicating a high morbidity burden. Three quarter of these (76.3%) reported to have been taken to the health facility indicating positive health facility utilization. Interventions to prevent diarrhoea, including safe drinking-water, use of improved sanitation and hand washing with soap need to be strengthened and maintained. To reduce the morbidity caseload further there is also need to maintain the current health service provision. Top morbidities (malaria, respiratory tract infections, skin infections and intestinal worms) should also be given special attention.

## Programme coverage children 6 – 59 months

*Selective feeding programme*

The coverage of Targeted Supplementary Feeding Program (TSFP) using MUAC did not meet the recommended standard of >90%. The coverage was 75%. Strengthening of active case screening at the community to be recommended. Program coverage calculation using both WHZ- score and MUAC admission criteria was not calculated as there was no mechanism put in place of systematically screening children with <-2zscores except when children present at the health/nutrition centre. Analysis of MUAC versus WHZ z-scores noted that only 25% of the children that had a proportion on MUAC <12.5 cm had < _2 Z-scores. In this light, a mixed criteria for admission using MUAC or WHZ scores to capture the children missed by either MUAC or the WHZ scores admission criteria is proposed. To improve coverage a two stage monthly screening to be carried out during BSFP for children 6-23 months and for all children 24-59 months presenting at the health facility. All children 6-59 months found to be at risk (12.5 -13.8cm)[6] to go through a second stage weight for height z-score measurement and any child found to meet the admission criteria using the WHZ scores to be enrolled into the appropriate program.

*Measles vaccination and vitamin A supplementation*

The coverage for measles vaccination and vitamin A supplementation in the last 6 months prior to the survey was found to be slightly below the target of ≥95% and ≥90% for measles vaccination and vitamin A supplementation respectively indicating the need to strengthen both the routine and campaign vaccination/supplementation interventions. As these results were based on both card and recall there is also need to continue improving the coverage of cards for reliability and monitoring.

## Food security related

Currently the ration Makpandu ration only provides 71% of the recommended calories which is insufficient in a population that predominantly relies on the general food ration. In addition to this there was a pipeline break in May 2017 thus the refugees in Makpandu did not receive any food assistance and in September the ration was provided at a 35% scale. The pipeline breaks were as a result of transport access challenges. In light of the access challenges to Makpandu there is need to preposition enough food in 2018 to avoid having refugees missing out on their entitlement.

[6] Makpandu specific based on the 2017 survey analysis

## RECOMMENDATIONS AND PRIORITIES

### Nutrition related

Maintain a comprehensive CMAM program providing both therapeutic and supplementary feeding programs to facilitate the rehabilitation of identified acute malnourished children, pregnant and lactating women, people living with HIV/AIDS and TB patients on treatment. This to include active case finding and community mobilization. (UNHCR, UNICEF, WFP and WVI).

Ensure all community screened and referred 6-59 months children identified with a MUAC less than 125mm get enrolled into the management of acute malnutrition programs through community outreach follow up at household level (WVI)

Maintain blanket supplementary feeding programme for children 6-23months, pregnant and lactating women using a fortified blended food or lipid based supplement to prevent malnutrition and to cover the nutrient gap these vulnerable groups have in light of a predominant grain based general food diet (UNHCR, WFP and WVI)

Conduct a two step MUAC and WHZ scores (for children with MUAC at risk) screening monthly at the BSFP site and the PHCC triage area in Makpandu to ensure both high MUAC and WHZ score coverage (WVI)

Continue strengthening the capacity of the established nutrition facility in terms of nutrition supplies and staff training to facilitate quality provision of both curative and preventative components of nutrition (UNHCR, WFP, UNICEF and WVI)

Strengthen the prevention of malnutrition components including IYCF and community outreach education aspects to stop malnutrition from occurring in the first place. (UNHCR, UNICEF and WVI)

Conduct follow up quarterly mass MUAC screening to monitor the evolution of the nutrition situation in Makpandu settlement. (WVI)

Ensure regular monitoring, quarterly joint monitoring and yearly program perfomance evaluations in Makpandu to assess performance progress and formulate recommendations for any identified gaps. (UNHCR, WFP, UNICEF and WVI).

Undertake a follow up annual nutrition survey to analyze trends and facilitate program impact evaluation. (UNHCR, WVI, WFP and UNICEF).

### Food security related

General food ration providing the minimum dietary requirements (2100kcal/person/day) is critical to ensure basic nutrition provision. Currently the ration provided in Makpandu settlement only provides 1491 kcal/p/d (71%) of the recommended calories which is insufficient in a population that predominantly relies on the general food ration In addition to this prepositioning of 2018 supplies to be carried out at the beginning of the year to avoid pipeline breaks (UNHCR, WVI and WFP).

Continue the routine joint monthly food basket monitoring on site and beneficiary contact monitoring at the household level in Makpandu to ensure that refugees receive their entitlement (UNHCR, WVI and WFP).

Expand the coverage of sustainable food security and livelihood solutions in in Makpandu to complement the general food distribution (UNHCR, WFP and WVI).

## Health related

Maintain and strengthen the provision of comprehensive primary health programme for refugees and host populations in Yambio. (UNHCR and WVI)

UNICEF, WVI and UNHCR to ensure the EPI program and Vitamin A supplementation campaigns and the routine programmes are maintained and strengthened to increase coverage to acceptable standards.

Adequate clean water provision to be maintained in 2018. In addition to this hygiene promotion and latrine coverage strengthening to reduce the diarrhoea caseload to be ensured. (UNHCR and WVI)

## APPENDICES

### Appendix 1: Names of contributors

| | Name | Role | Organisation |
|---|---|---|---|
| 1 | Babunge Angele | Enumerator | WVI |
| 2 | Dijas Nasran Abdulhaman | Enumerator | WVI |
| 3 | Hayat Sebit | Enumerator | WVI |
| 4 | Hipaingba Marie | Enumerator | WVI |
| 5 | Joseph Martin Saraba | Enumerator | WVI |
| 6 | Joseph Miwai Alex | Enumerator | WVI |
| 7 | Marie Lapatric Jeuea | Enumerator | WVI |
| 8 | Naade Justine Zege | Enumerator | WVI |
| 9 | Nahon Kahsay Hablegerash | Enumerator | WVI |
| 10 | Nalayenga Alphonstine Zege | Enumerator | WVI |
| 11 | Secopa Linzelinze | Enumerator | WVI |
| 12 | Sentina Martin | Enumerator | WVI |
| 13 | Suzy Emmanuel Dogberengere | Team leader | WVI |
| 14 | Yabu Betty Jackson | Team leader | WVI |
| 15 | Gimiko Box Elias | Team leader | WVI |
| 16 | Justine Richard Kumboagbia | Team leader | WVI |
| 17 | Linda Elis Bandas | Team leader | WVI |
| 18 | Joyce Apollo Mundu | Team leader/Supervisor | WVI |
| 19 | Richman John Lollis | Supervisor | WVI |
| 20 | Samuel Paul | Survey operations support | UNHCR |
| 21 | Jackline Lollis | Survey operations support | UNHCR |
| 22 | Terry Theuri | Coordinator | UNHCR |
| 23 | Akol Vankar Lonyamoi | Training Facilitator | UNICEF |
| 23 | Melody Muchimwe | Training Facilitator | WFP |

### Data analysis and report compilation

Terry Theuri (Nutrition Officer, UNHCR Juba, South Sudan)

### Report review

Gebrewold Petros Yohannes (Senior Public Health Officer, UNHCR Juba, South Sudan), Naser Mohmand (Senior Regional Nutrition and Food security officer, Regional Service Centre, Nairobi)


### Funding

UNHCR and WVI supported the survey. UNICEF and WFP provide the nutrition program supplies and also support with capacity building.

## Appendix 2: Summary of overall quality of anthropometric data (weight-for-height data)

### 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** (0.4 %) |
| Overall Sex ratio | Incl | p | >0.1 | >0.05 | >0.001 | <=0.001 | |
| (Significant chi square) | | | 0 | 2 | 4 | 10 | **0** (p=0.607) |
| 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=0.380) |
| Dig pref score - weight | Incl | # | 0-7 | 8-12 | 13-20 | > 20 | |
| | | | 0 | 2 | 4 | 10 | **0** (7) |
| Dig pref score - height | Incl | # | 0-7 | 8-12 | 13-20 | > 20 | |
| | | | 0 | 2 | 4 | 10 | **2** (10) |
| Dig pref score - MUAC | Incl | # | 0-7 | 8-12 | 13-20 | > 20 | |
| | | | 0 | 2 | 4 | 10 | **0** (6) |
| Standard Dev WHZ | Excl | SD | <1.1 | <1.15 | <1.20 | >=1.20 | |
| . | | | and | and | and | or | |
| . | Excl | SD | >0.9 | >0.85 | >0.80 | <=0.80 | |
| | | | 0 | 5 | 10 | 20 | **0** (1.00) |
| Skewness WHZ | Excl | # | <±0.2 | <±0.4 | <±0.6 | >=±0.6 | |
| | | | 0 | 1 | 3 | 5 | **1** (-0.36) |
| Kurtosis WHZ | Excl | # | <±0.2 | <±0.4 | <±0.6 | >=±0.6 | |
| | | | 0 | 1 | 3 | 5 | **1** (0.35) |
| Poisson dist WHZ-2 | Excl | p | >0.05 | >0.01 | >0.001 | <=0.001 | |
| | | | 0 | 1 | 3 | 5 | **0** (p=0.221) |
| OVERALL SCORE WHZ = | | | 0-9 | 10-14 | 15-24 | >25 | **4** % |

The overall score of this survey is 4 %, this is excellent.

## Appendix 3: Nutrition Surveys Questionnaires October 2017

### Greeting and Reading of Rights

**THIS STATEMENT IS TO BE READ TO THE HEAD OF THE HOUSEHOLD OR, IF THEY ARE ABSENT, ANOTHER ADULT MEMBER OF THE HOUSE BEFORE THE INTERVIEW. DEFINE A HOUSEHOLD AS A GROUP OF PEOPLE WHO LIVE TOGETHER AND ROUTINELY EAT OUT OF SAME POT. DEFINE HEAD OF HOUSEHOLD AS MEMBER OF THE FAMILY WHO MANAGES THE FAMILY RESOURCES AND IS THE FINAL DECISION MAKER IN THE HOUSE.**

Hello, my name is _____ and I work with [organization/institution]. We would like to invite your household to participate in a survey that is looking at the nutrition and health status of people living in this camp.

UNHCR and WVI are working in the nutrition and health sectors are sponsoring this nutrition survey Taking part in this survey is totally your choice. You can decide to not participate or stop taking part at any time and for any reason. If you stop being in this survey it will not have any negative effects on how you or your household is treated or what aid you receive.

If you agree to participate, I will ask you some questions about your family. We will then measure the arm circumference, weight and height of children who are older than 6 months up to 5 years.

Before we start to ask you any questions or take any measurements, we will ask you to give your verbal consent. Be assured that any information that you will provide will be kept strictly confidential. You can ask me any questions that you have about this survey before you decide whether to participate.

Thank you

Questionnaire for Children 6-59 months (every other HH)

THIS QUESTIONNAIRE IS TO BE ADMINISTERED TO ALL CARETAKERS OF A CHILD THAT LIVES WITH THEM AND IS BETWEEN 6-59 MONTHS OF AGE

| Date (dd/mm/yyyy) | Camp | Team Number | Block |
|---|---|---|---|
| \|__\|__\|/\|__\|__\|/\|__\|__\|\|__\|__\| | | \|__\|__\| | \|__\|__\| |

| CH1 | CH2 | CH3 | CH4 | CH5 | CH6 | CH7 | CH8 | CH9*** | CH10*** | CH11 | CH12 | CH13 | CH14 | CH15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | HH | Consent given 1=yes 2=no 3=absent | Sex (m/f) | Birthdate* dd/mm/yyyy | Age** (months) | Weight (kg) ±100g | Height (cm) ±0.1cm | Oedema (y/n) | MUAC (cm) | If MUAC <12.5cm is child enrolled 1=TSFP 2=OTP 3=None of the above | Measles 1=Yes card 2=Yes recall 3=No or don't know | Vit. A in past 6 months (show capsule) 1=Yes card 2=Yes recall 3=No or don't know | Diarrhoea in past 2 weeks# 1=Yes 2=No 8=Don't Know | If yes, was the child taken to the health facility? 1=Yes 2=No 8=Don't Know |
| 01 | | | | / / | | | | | | | | | | |
| 02 | | | | / / | | | | | | | | | | |
| 03 | | | | / / | | | | | | | | | | |
| 04 | | | | / / | | | | | | | | | | |
| 05 | | | | / / | | | | | | | | | | |
| 06 | | | | / / | | | | | | | | | | |
| 07 | | | | / / | | | | | | | | | | |
| 08 | | | | / / | | | | | | | | | | |
| 09 | | | | / / | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |

**Record from EPI/health card/age documentation if available. Leave blank if no valid age documentation. **Estimate using event calendar and recall if age documentation not available. ***C9 & C10: Refer to clinic for malnutrition if not already enrolled in TSFP / OTP/SC if oedema=y or MUAC < 12.5cm. #Diarrhoea: 3 or more loose stools within 24hrs*

## Appendix 4: Events Calendar

*Dark grey areas are for children not eligible for 6-59 month*

| Seasons | Religious Holidays | Other Events | Months / Years | Age (M) | Height Range |
|---|---|---|---|---|---|
| Harvest of Sorghum/Maize | | | October 2017 | 0 | |
| Harvest of groundnuts & Beans | | | September 2017 | 1 | |
| | | | August 2017 | 2 | |
| Crop Weeding continues | | | July 2017 | 3 | |
| Weeding of crops | | World refugee day (20 June) | June 2017 | 4 | |
| | | | May 2017 | 5 | |
| Planting season | | | April 2017 | 6 | |
| Land preparation | | | March 2017 | 7 | 65-70 cm |
| | | | February 2017 | 8 | |
| Renovation/Building of houses | | CPA & New year celebrations | January 2017 | 9 | 71-76 cm |
| | Christmas (25 Dec) | | December 2016 | 10 | |
| Post harvest | | | November 2016 | 11 | |
| Harvest of Sorghum/maize | | | October 2016 | 12 | |
| Harvest of groundnuts & beans | | | September 2016 | 13 | |
| | | | August 2016 | 14 | 77-80 cm |
| Crop Weeding continues | | | July 2016 | 15 | |
| Weeding of crops | | World refugee day (20 June) | June 2016 | 16 | |
| | | | May 2016 | 17 | |
| Planting season | | | April 2016 | 18 | |
| Land preparation | | | March 2016 | 19 | |
| | | | February 2016 | 20 | |
| Renovation/Building of houses | | CPA & New year celebrations | January 2016 | 21 | 81-86 cm |
| | Christmas (25 Dec) | | December 2015 | 22 | |
| Post harvest | | | November 2015 | 23 | |
| Harvest of Sorghum/maize | | | October 2015 | 24 | |
| Harvest of groundnuts & beans | | | September 2015 | 25 | |
| | | | August 2015 | 26 | 87-90 cm |
| Crop Weeding continues | | | July 2015 | 27 | |
| Weeding of crops | | World refugee day (20 June) | June 2015 | 28 | |
| | | | May 2015 | 29 | |
| Planting season | | | April 2015 | 30 | |
| Land preparation | | | March 2015 | 31 | |
| | | | February 2015 | 32 | |
| Renovation/Building of houses | | CPA & New year celebrations | January 2015 | 33 | |
| | Christmas (25 Dec) | | December 2014 | 34 | |
| Post harvest | | | November 2014 | 35 | |
| Harvest of Sorghum/maize | | | October 2014 | 36 | |
| Harvest of groundnuts & beans | | | September 2014 | 37 | |
| | | | August 2014 | 38 | 91-99 cm |
| Crop Weeding continues | | | July 2014 | 39 | |
| Weeding of crops | | World refugee day (20 June) | June 2014 | 40 | |
| | | | May 2014 | 41 | |
| Planting season | | | April 2014 | 42 | |
| Land preparation | | | March 2014 | 43 | |
| | | | February 2014 | 44 | |
| Renovation/Building of houses | | CPA & New year celebrations | January 2014 | 45 | |
| | Christmas (25 Dec) | | December 2013 | 46 | |
| Post harvest | | | November 2013 | 47 | |
| Harvest of Sorghum/maize | | | October 2013 | 48 | |
| Harvest of groundnuts & beans | | | September 2013 | 49 | |
| | | | August 2013 | 50 | 100-110 cm |
| Crop Weeding continues | | | July 2013 | 51 | |
| Weeding of crops | | World refugee day (20 June) | June 2013 | 52 | |
| | | | May 2013 | 53 | |
| Planting season | | | April 2013 | 54 | |
| Land preparation | | | March 2013 | 55 | |
| | | | February 2013 | 56 | |
| Renovation/Building of houses | | CPA & New year celebrations | January 2013 | 57 | |
| | Christmas (25 Dec) | | December 2012 | 58 | |
| Post harvest | | | November 2012 | 59 | |
| Harvest of Sorghum/maize | | | October 2012 | 60 | |

Appendix 5: Makpandu refugee camp location in south Sudan