TECHNICAL PROTOCOL

FOR

SMART Survey in Jur River County, Western Bahr-El-Ghazal, South Sudan

Submitted by

REACH Initiative

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1.0 BACKGROUND

1.1 Introduction

South Sudan, the world's youngest country having gained independence from Sudan in 2011, has faced internal conflict since 2013, causing widespread displacements, disrupted livelihoods, and chronically high levels of acute food insecurity and malnutrition in many parts of the country. A Peace deal was signed in September 2018, which resulted in improved security and increased access to affected populations for humanitarian assistance, and an increase in refugee and Internal Displaced Person (IDP) returnees to their communities. However as of July 2021, there remains an estimated 2.26 million refugees from South Sudan residing in neighboring countries (Uganda, Sudan, Ethiopia, Kenya, DRC). The consolidated findings from the Integrated Food Security Phase Classification (IPC) Technical Working Group and External Reviews shows 6.83 million people were in need of humanitarian food assistance (Phase 3 and above) in April 2022, of which 2.37 million of these people are facing Emergency (IPC Phase 4) acute food insecurity. With an estimated 7.74 million people in South Sudan likely experiencing high levels of acute food insecurity (IPC Phase 3 or above) between April and July 2022 and . In addition, an estimated 1.34 million children under the age of five in South Sudan will likely suffer from acute malnutrition over the course of 2022. These include about 87,000 classified in IPC Phase 5 Catastrophe, which is the highest number in previous year, and an estimated 55,000 people were already classified in Catastrophe (IPC Phase 5) in Fangak, Canal Pigi and Uror counties in Jonglei State; Pibor County in Greater Pibor Administrative Area; Tambura County in Western Equatoria State; and Leer and Jur River counties in Unity State.

Jur River County is located in Western Bahr el-Ghazal State. The county borders Wau County to the west, Northern Bahr el-Ghazal State to the north-west, Warrap State to the east and Western Equatoria State to the south. The County headquarters is currently located in Wau Bai Payam. As a water source, the Jur River attracts livestock during the dry season. Jur River county has 6 payams; Wau Bai (County Headquarters), Kangi, Kuarjena, Marial Bai, Rocrocdong and Udici. The 2022 population projection was 283,228 compared to 273,118 in 2020 and 127,771 in the 2008 census. The main ethnic group living in Jur river county are the Balanda Bor and Luo (Jur Chol). Base on the recent IPC Analysis conducted in October 2022, Jur River County was classified as Alert (Phase 2) for current projection and Serious (Phase 3) for projection periods[1]. Food consumption is likely to deteriorate due to the depleting available food stock from own production as the population will tend to depend on other sources to diverse their food consumption as per Integrated Food Insecurity Phase Classification – Acute Food Insecurity (IPC AFI), convergence of evidence Jur River County in general will fall on phase 2 for current and phase 3 classification for projection periods with more population in phase 3 and 4.

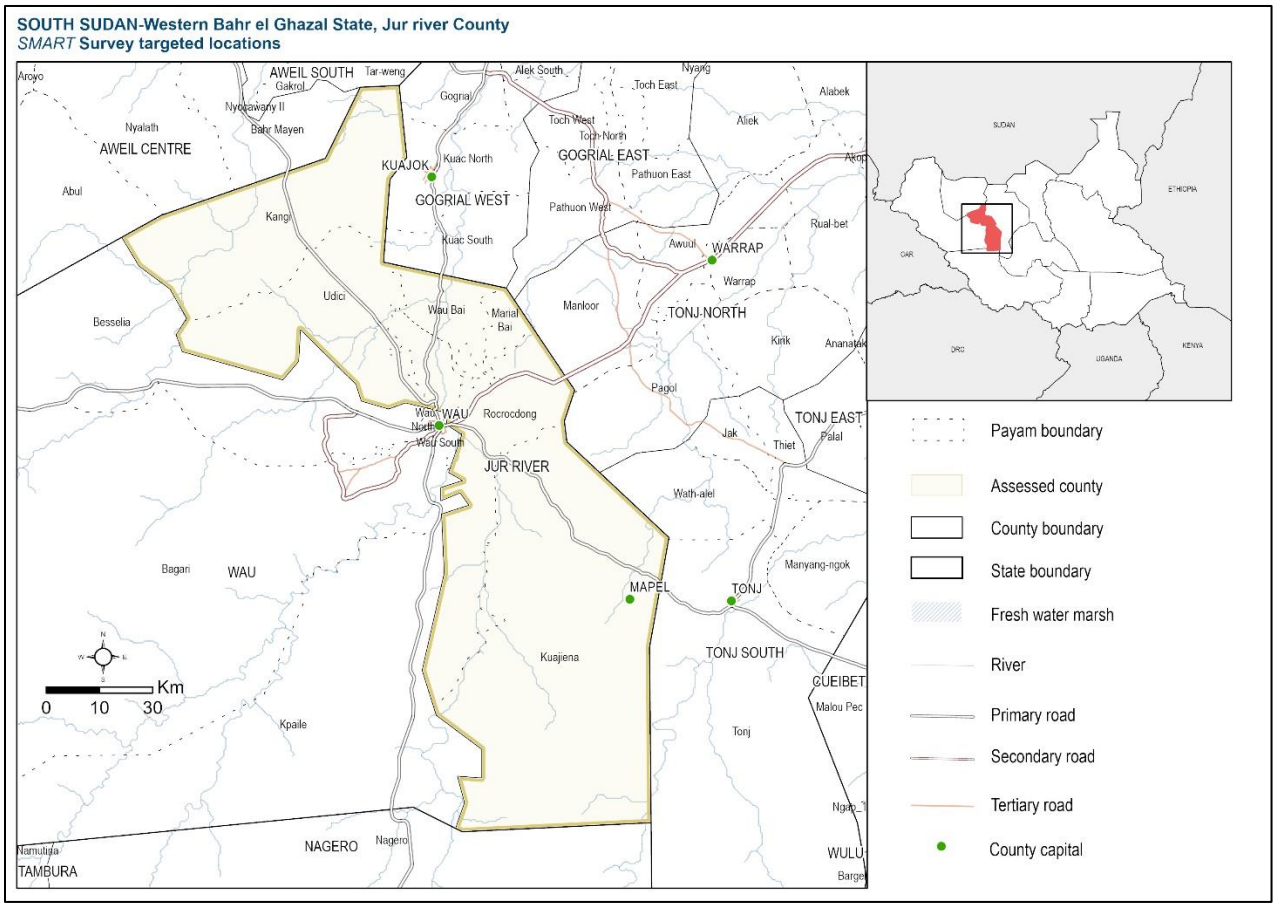
The primary economic activity in Jur River County is agriculture. However, with the people in Jur River County being agro-pastoralists, they engage in both agriculture and rearing of livestock especially cattle With Jur River county being located alongside the Jur River, fishing also serves as a livelihood for some communities. Johanniter international assistance is the leading Nutrition partner in the area, ACTED is operating on the FSL food security and livelihood (FSL) activities, Nutrition, Protection and Social cohesion and Johanniter international Assistance providing preventive and curative malnutrition, Johanniter also implement FSL, water, sanitation, and hygiene (WASH) and Protection. Cordaid and CARE are other organizations implementing WASH and health within all six Payams of Jur River county.

REACH Initiative has worked in South Sudan since 2012 conducting needs assessments and providing evidence-based information to inform the humanitarian response in South Sudan. Since 2019, REACH has engaged with the Nutrition Information Working Group (NIWG), participated in IPC Acute Malnutrition analysis workshops, and provided technical support to nutrition partners for SMART survey implementation in the country.

The nutrition situation in Jur River County remains an information gap for implementing partners as well as for the IPC AMN. The previous SMART survey which was conducted in December 2017, show the prevalence of global acute malnutrition in the survey area based on the weight-for-height and/or oedema was 10.1 % % (7.2 - 13.9 95% C.I.) which is classified as serious according to the WHO classification of global acute malnutrition. In order to fill this information gap, ACTED, Johanniter international assistance and REACH Initiative plan to implement a SMART survey from approximately November 11th to December 5th, collecting anthropometric and mortality data, as well as key multi-sectoral indicators (FSL, WASH, Health) to better understand the status on AMN in Jur River County as well as its key drivers.

[1] https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155999/?iso3=SSD

Figure 1 Jur River County



1.2 Survey Objectives

General Objectives

To assess the nutrition situation and retrospective mortality rates amongst the population in Jur River County and to analyse the possible factors contributing to acute malnutrition of the community in Jur River County, Western Bahr-El-Ghazal, South Sudan.

In particular, the following are the specific objectives of the assessment:

Specific Objectives

1. To estimate the prevalence of acute malnutrition, stunting and underweight among children (boys and girls) aged 6 – 59 months in Jur River County.
2. To estimate retrospective Crude Mortality Rate (CMR) and Under 5 Mortality Rate (U5MR) in Jur River County.
3. To estimate the proxy coverage of acutely malnourished children 6-59 months in any nutrition program in Jur river County.
4. To estimate the proxy coverage of Pregnant and Lactating Women (PLWs) in Targeted Supplementary Feeding Programmes (TSFP) and estimate prevalence of acute malnutrition among pregnant and lactating women (PLWs) in Jur River County.
5. To estimate the coverage of various immunizations in Jur River County including:
    - Vitamin A supplementation (for children 6-59 months)

- Deworming (for children 12 to 59 months)
- Measles vaccination coverage among children 9-59 months.

6. To assess childhood morbidity and health seeking behaviors among children aged 6-59 months in Jur River County.
7. To assess the WASH situation in Jur River County (Main water source, distance/time to water source, water treatment status, access to latrine)
8. To assess food security and livelihoods situation in Jur River County [Food Consumption Scores (FCS), Household Hunger Scale (HHS), main livelihoods, and Livelihood Coping Strategies (LCS)]
9. To estimate the % of HHs received food assistance in the past 3 months in Jur River County.
10. To formulate practical interventions and recommendations for both emergency and long-term programs of Juhaniter International in Jur River County.

1.3 Survey Areas

The SMART survey will be implemented in Jur River County, which covers, Wau Bai (County Headquarters), Kangi, Kuarjena, Marial Bai, Rocrocdong, and Udici payams.

2.0 METHODOLOGY

2.1 Survey Design

The survey will apply two stage cluster sampling using the SMART methodology with the clusters being selected using the probability proportional to population size (PPS). Stage one sampling will involve the sampling of the clusters to be included in the survey while the second stage sampling will involve the selection of the households from the sampled clusters.

2.2 Study Population

The target population for this survey will be children aged 6 – 59 months for the anthropometric and child health seeking behaviors components, and the general population for the Mortality, FSL and WASH components.

2.3 Sample Size Estimation

Sample size calculation for the survey will be based on the expected prevalence of Global Acute Malnutrition (GAM) and Mortality Rate in the survey areas. The parameters used have been extracted from the previous survey reports conducted in December 2017. Anthropometric and Mortality Sample sizes have been calculated using ENA software (January 11th, 2020) following SMART methodology.

2.3.1 Anthropometric Sample Size

Table 1: Sample Size (Anthropometric)

Parameter	Jur river County	Justification
Estimated Prevalence (%)	10.1	Jur River SMART survey was conducted in December, 2017 by The Johanniter International Assistance South Sudan, 10.1 % % (7.2 - 13.9 95% C.I.) As the situation in Jur river has remained the same as per the IPC recent findings. The current IPC AMN classification is P2 and projection is P3 for both projection periods.
Desired Precision	3.5	Base on the Last SMART survey Guide
Design Effect	1.32	From the 2017 SMART Survey Conducted by Johanniter international assistance.
Children to be Included	**409**	
Average Household Size	7.2	From the 2017 SMART Survey Conducted by Johanniter international assistance.
% children Under-Five	20.5%	From the 2017 SMART Survey Conducted by Johanniter international assistance.

% Non-Respondents	3%	From the 2017 SMART Survey Conducted by Johanniter international assistance.
Households to be Included	**318**	

2.3.2 Mortality Sample Size

Table 2: Sample Size (Mortality)

Parameter	Jur River County	Justification
Estimated death rate per 10,000/day	0.55	Jur River SMART survey was conducted in December, 2017 by The Johanniter International Assistance South Sudan, 0.55 (0.28-1.07 95% CI). The same estimated death rate is used as the situation remain the same.
Desired Precision	0.35	This is taken as per the SMART guidance
Design Effect	1.41	From the 2017 SMART Survey Conducted by Johanniter international assistance.
Recall Period	93	Will be Updated When The SMART survey start
Population to be Included	**2847**	
Average Household Size	7.2	From the 2017 SMART Survey Conducted by Johanniter international assistance.
% Non-Respondents	3%	From the 2017 SMART Survey Conducted by Johanniter international assistance.
Households to be Included	**408**	

The maximum sample size is returned by the mortality sample size calculation and this will be considered the final sample size, with 408 households as the situation in Jur River county have deteriorated.

2.3.3 Number of Clusters

To determine the number of clusters required, the number of households that a team can comfortably survey in a day was estimated using the parameters found in the Table 3 below:

Table 3: Number of Households a Team can Sample in a Day

Activity	Estimated Time
Departure from Office	**8:00 AM**
a. Daily morning Briefings	*15min*
b. Travel to clusters	*60 min*
c. Introduction and HH list development	*30 min*
d. Lunch break	*30 min*
e. Total Time from one HH to another	*5 min*
f. Travel back to base	*60 min*
Total time for HH listing, travelling and breaks (a + b + c + d + f)	195 min
Arrival back to Base	**6:00 PM**
Total Available time in a day	10hrs (600 minutes)
Available time for work	600 - 195 minutes= 405 minutes
Time taken to complete one questionnaire	*25 minutes*
Total time per household	*30 minutes*

Note: The above are only estimates based on past experience, but will be updated after the pilot survey has been conducted and thus, slight changes may be expected.

Given the above, the number of households that a team can comfortably visit in a day is calculated as follows:

405 (min) / 30 (min) =13.5 **HH/per day ~ 13 HH**

Given the above, the number of clusters per survey area is presented in the table below:

	Jur River
Total number of HH based on sample size calculation	408
Total number of HH to be assessed per day per team	13
Clusters Needed	31.38
Rounded UP	**32**
Reserve Clusters	**4**
Total Clusters	**36**

2.4 Sampling Procedure: Selection of Clusters

A two-stage cluster sampling design will be used to sample the survey clusters and households. In the first stage, clusters will be assigned using probability proportional to size (PPS). The sampling frame for the 1st stage sampling will be the list of villages with the population estimates in each of the survey area. The list of villages will then be entered into ENA for SMART software (version Jan 2020) and clusters assigned using probability proportional to size (PPS) as per calculation.

2.5 Sampling Procedure: Selection of Households and Children

Definition of household for the survey: A household will be defined as a group of people living together, that cook and eat from the same cooking pot. Polygamous families will be defined based on the same, if each wife has her own pot, even if living in the same compound, this will be treated as different households. On arrival in the selected clusters, the team leader will meet with the village elders. The team will introduce themselves, explaining the survey objectives as well as expectations from the elder.

Household selection techniques: The standard definition of a HH will be shared to aide in developing the HH listing within the cluster. One of two methods will be used for household listing; (1) a verbal listing from one or more community leaders, and if not possible then (2) a manual house to house listing. Thirteen households will then be randomly selected from the complete list of HHs using the random number generator in Smart phones. These are the HHs that will be visited by the survey team. The village guide and community leaders will support the teams in updating the list of households.

For clusters with more than 150HHs, segmentation will be used to select one portion of the cluster that will represent the cluster. Selection of segments will be done using either PPS or simple random sampling dependent on the population sizes of the specific segments[2]. In the selected segment the process of HH selection will follow the same process done in each cluster for selection of the 13 HH.

In selected households, all eligible children (aged 6-59 months) will be measured and the household questionnaire applied. Empty households and households with absent children will be re-visited and information of the outcome recorded on the cluster control form. This form will also be used to record information on empty and non-responding households.

2.6 Survey Teams, Training, Data Collection and Data Management

- Survey Teams: Six teams with four members (1 Team Leader, 1 measurer, 1 assistant, 1 tablet person) in each team will be involved in the execution of the survey. At each cluster, a local guide will be employed to facilitate data collection at the household level. The survey teams will be recruited by REACH with the involvement of the local officials at Jur River County level. As possible, the team members will be a mix of both males and females and will be recruited from the local communities. Supervisors will consist of a mix of Johaniter International and REACH staff.
- Training: The survey teams will be trained for five days with the training planned to start on 18th November, 2022. The training will cover various components including: taking anthropometric measurements, sampling of households, data collection tools, digital data collection, data quality checks, standardization exercise among other themes. The training of the enumerators will be facilitated by SMART certified staff and staff with experience conducting SMART surveys.

[2] As per the SMART Guidelines, if the Segments will have almost equal population sizes, then, SRS will be used; but if the population sizes will be different, then PPS method will be use

- Supervision: The overall management of the survey will be done by REACH Initiative with support from RRC, county CHD and Johaniter International. Maximum supervision of the survey teams will be ensured to facilitate quality data.
- Data Entry and Management: Data will be collected through REACH tablets through ODK. The data collection tools will be programmed and uploaded in the tablets which will be used by the survey teams. The teams will be uploading the collected data to a central server on daily basis to allow the Survey Manager to review the data collected each an everyday and clean the data and give the feedback every morning to the teams'.

NB: Backup manual forms will be carried by each team as a contingency plan in any eventuality that teams face challenges with the SMART phones

2.7 Data Quality

In order to ensure optimal and high data quality, a number of measures will be put in place which includes:

a) The survey will be done in accordance with the submitted protocol, and that the following will be ensured:
    a. Ensure that training of survey teams is done using standardised material as recommended by SMART Methodology
    - Undertake standardisation test as part of the training; taking appropriate steps thereafter based on performance of the survey teams
    - Appropriate calibration of survey equipment, during the training and on every morning before proceeding to the field for data collection
    - Plausibility checks will be conducted on daily basis and inform the daily debriefing sessions which will be conducted every day
b) Data will be collected through digital platform, and control checks and skip patterns will be programmed to improve the data quality
c) Anthropometry data will be auto analysed using ENA software anthropometry section. The same software will be used to analyse the mortality data.

2.8 Questionnaire

The survey will adopt the data collection tools which have been developed by the Global SMART Team for both anthropometric and mortality surveys. Other indicators will be collected using the modules in line with current FSNMS questionnaires as much as possible.

2.9 Data to be Collected

1. **Anthropometry**
    - **Age:** Will be determined using birth/health cards/ records if available and local calendar of events which will be jointly developed by local leaders and survey enumerators.
    - **Sex:** Male or female
    - **Weight:** Children's weights will be taken without clothes using mother and child digital weighing scales (SECA scales with precision of 100gm).
    - **Height/length:** Children will be measured using the wooden UNICEF measuring boards (precision of 0.1cm). Children less than 2 years of age will be measured lying down, while those greater than or equal to 2 years of age will be measured standing up.
    - **Mid-upper arm circumference:** MUAC measurements will be taken at the mid-point of the left upper arm using both the child and adult MUAC tapes (precision of 0.1cm) for children 6-59 months and for adult women 15-49 years of age.
    - **Bilateral pitting oedema:** Will be assessed by the application of normal thumb pressure on both feet for 3 seconds.
    - **Referral:** All children with acute malnutrition and not already enrolled in treatment will be referred using referral forms to existing TSFP and OTP programs in the county.
2. **Demographics and Mortality:** The following information will be collected for all current household members: age in years, sex, whether they were born, or had joined the household during the recall period. For household members that left during the recall period, will collect the age in years, sex, and whether they had joined or born into the household during the recall period. For persons who have died during the recall period, will collect age in years, sex, whether born or joined the household during the recall period, as well as estimated cause and location of death.
3. **Health Interventions Data:** Vitamin A supplementation, Deworming and Measles immunization data will be collected through health cards or recall.

4. **Morbidity**: Two-week retrospective morbidity data will be collected from mothers/caregivers of all children (6-59 months) included in the anthropometric survey.
5. **Food Security Indicators**:
    a. **Food Consumption Scores (FCS):** is an indicator of the general quantity and quality of foods being consumed in a household, based on how many days any household members have consumed 9 distinct food groups within a 7-day recall period. Households are categorized into categories of severity based on their responses. FCS is often used as a proxy for diversity of food consumed. Standard FCS thresholds are <21 for 'poor', 21-<=35 for 'borderline' and 35+ for 'acceptable'.
    b. **Household Hunger Scale (HHS):** measures the perceived hunger by asking the frequency a household has experienced three common experiences associated with hunger in the past 30 days (no food in the house, slept hungry, gone whole day and night without food). HHS is often used as a proxy for access to food. Thresholds and categories used for analysis are those used for IPC AFI in South Sudan.
    c. **Livelihood Coping Strategies (LCS)** – measures what strategies households are applying to cope with not having enough food or resources to get food. Ten coping strategies are asked about which are categorized as Emergency, Crisis, or Stress strategies.
6. **WASH** – indicators on main water source, access to latrines, distance/time to water source, and water treatment will be asked.

2.10 Data Analysis

The anthropometric and mortality data will be analysed using ENA for SMART (Jan 2020 version). The other additional data (immunization, maternal nutrition, morbidity etc.) will be analysed using R. Various statistics will be used to summarize the data including percentages, means, and median among others. The analysed data will be presented in both tabular and graphical presentations. The preliminary datasets will be available within 7 days after the last day of data collection, and the preliminary report within 14 days. The preliminary report will get feedback from Johaniter and REACH, before submission to the Nutrition Information Working Group (NIWG) for validation.

2.11 Ethical Considerations

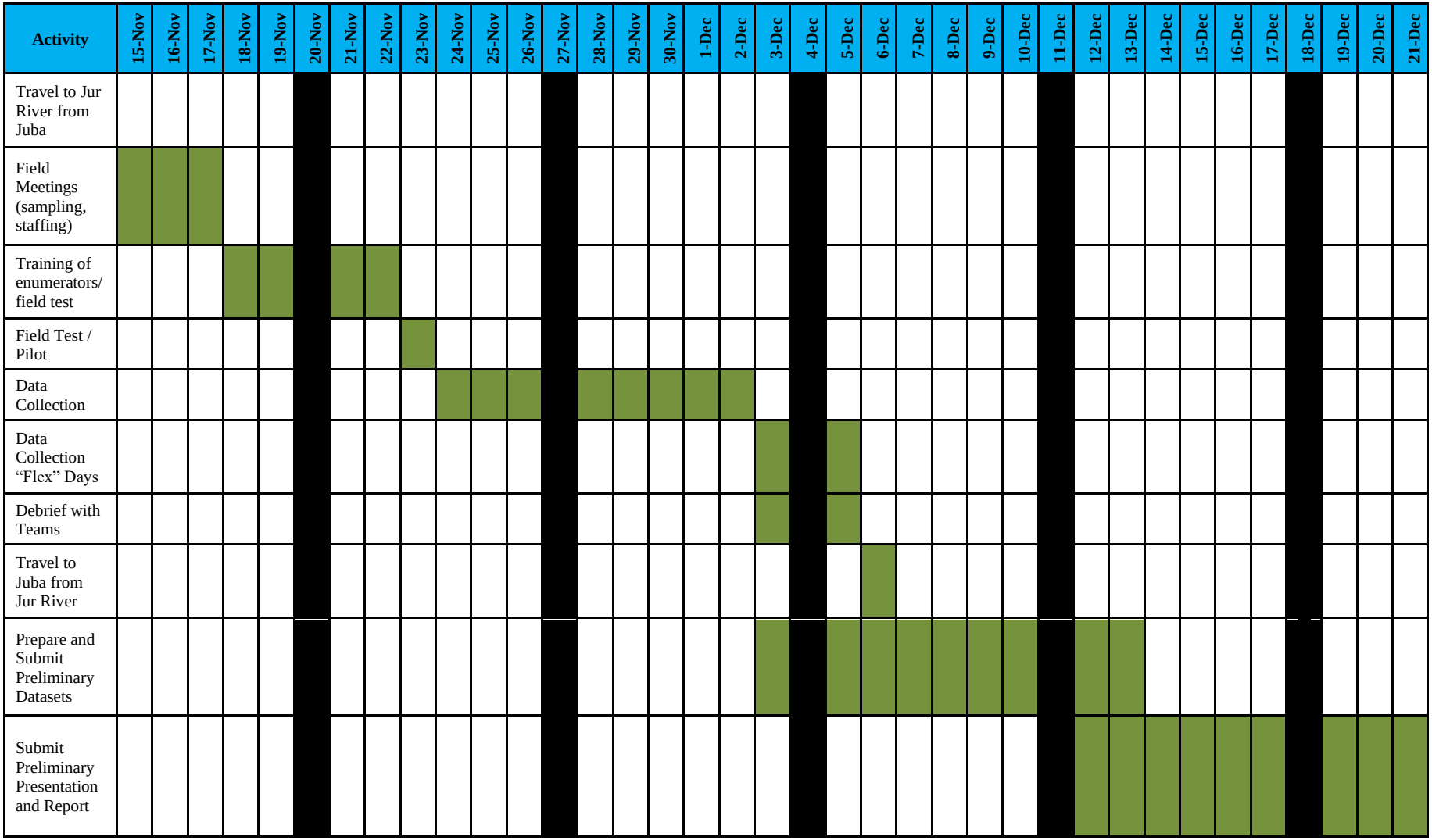
Informed consent – All households will be asked for informed consent prior to the survey. If a household does not wish to participate, they will be counted as non-response and the team will move to the next sampled household.

Referral – children identified as having acute malnutrition (either by MUAC, weight for height, or oedema) will be appropriately referred to health/nutrition services by the survey team leader.

COVID-19 Precautions – Per recommendations in-country and global recommendations, the following will be done during the survey to mitigate COVID-19 risk.

- Participants will be informed of the risks of COVID-19 during the consent statement, before agreeing to participation in the survey.
- Face masks will be provided to survey team members. Each team member will be provided with 3 disposable face masks per day.
- Face masks will be offered to household members, survey participants and children over 2 years of age during the survey.
- Temperature screenings will be conducted for survey team members at the beginning and end of each day during training and data collection.
- Team members will use hand sanitizer or soap and water before entering each household.
- Social distancing will be kept during household interviews, with interviewer and respondent staying 2 meters apart at all times, unless measurements are being taken.
- Temperature screenings will be implemented for household members of selected households. If any persons have a temperature >= 38 degree Celsius, the household will be excluded from data collection.
- Weighting scales, height boards and MUAC tapes will be continuously disinfected between households.

Survey Plan


Activity
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Travel to Jur River from Juba
Field Meetings (sampling, staffing)
Training of enumerators/ field test
Field Test / Pilot
Data Collection
Data Collection "Flex" Days
Debrief with Teams
Travel to Juba from Jur River
Prepare and Submit Preliminary Datasets
Submit Preliminary Presentation and Report

Annex 1: Events Calendar for Jur River November 2022

Month		Annual Events / Season	2017	2018	2019	2020	2021	2022
1	Jan	New Year Celebrations Sesame and Sorghum harvesting Cattle Movement		58 New Year 9th January CPA Celebration	46 Displacement of people to Wau PoC	34	22	10 The governor's visit
2	Feb			57	45	33	21	9
3	Mar	Land Preparations		56	44 President Visit to WeBG Fighting of IO and the IG	32	20	8
4	Apr	Easter celebration		55 Easter celebration	43 Easter celebration	31 Total Lock Down for Cov 19	19	7 Appointment of Jur River commissioner
5	May	SPLA Day Collection of lulu fruit		54 SPLA Day Collection of lulu fruit Measles outbreak in Jur river	42 SPLA Day Collection of lulu fruit Conflict between cattle keepers	30 SPLA Day Collection of lulu fruit	18 SPLA Day Collection of lulu fruit	6 SPLA Day Collection of lulu fruit
6	Jun	Marial-Bai Agreement		53 Marial-Bai Agreement	41 Marial-Bai Agreement	29 Marial-Bai Agreement	17 Marial-Bai Agreement	5 Marial-Bai Agreement
7	Jul	South Sudan Independence/ Martyrs Day Hunger breakout		52 SSD Indep/ Martyrs Day Hunger breakout	40 SSD Indep/ Martyrs Day Hunger breakout	28 SSD Indep/ Martyrs Day Hunger breakout	16 SSD Indep/ Martyrs Day Hunger breakout	4 SSD Indep/ Martyrs Day Hunger breakout Flooding in Jur river
8	Aug	World Breast Feeding Week		51 World Breast Feeding Week	39 World Breast Feeding Week	27 World Breast Feeding Week	15 World Breast Feeding Week	3 World Breast Feeding Week Review of Luo Customary marriage
9	Sep	Massive Flooding		50	38	26	14	2

10	Oct	Daniel Comboni Day		49 Daniel Comboni Day	37 Daniel Comboni Day	25 Daniel Comboni Day	13 Daniel Comboni Day	1 Daniel Comboni Day
11	Nov	Grand Parents Day. Initiation of ceremony for young people to become adults.		**48** Grand Parents Day. Initiation of ceremony for young people to become adults.	**36** Grand Parents Day. Initiation of ceremony for young people to become adults.	**24** Grand Parents Day. Initiation of ceremony for young people to become adults.	**12** Grand Parents Day. Initiation of ceremony for young people to become adults.	0 Grand Parents Day. Initiation of ceremony for young people to become adults.
12	Dec	Christ mass. Cutting of grass for building	59 Cutting of grass for construction	47 Christ mass. Cutting of grass for building	35 Christ mass. Cutting of grass for building	23 Christ mass. Cutting of grass for building	11 Christ mass. Cutting of grass for building	

Appendices – Survey questionnaires


HH Anthro and Food Consumption Listing I


Household Listing Form_10052021.pdf


Referral Form.pdf