SMART survey report in Aweil West County, Northern Bahr El Ghazal State, South Sudan

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REACH Initiative

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List of acronyms

AFI: Acute Food Insecurity
AMN: Acute Malnutrition
CDC: Centers for Disease Control and Prevention
CDR: Crude Death Rate
CFR: Crude Fatality Rate
CHD: County Health Department
CM: Centimeters
CI: Confidence interval
CMR: Crude Mortality Rate
DEFF: Design Effect
ENA: Emergency Nutrition Assessments
EIBF: Early Initiation of Breastfeeding
EBF: Exclusive Breastfeeding
FCDO: Foreign, Commonwealth and Development Office
FCS: Food Consumption Score
FSL: Food Security and Livelihoods
FSNMS: Food Security and Nutrition Monitoring System

GAM:	Global Acute Malnutrition
GFD:	General Food Distribution
HFA:	Height for Age
HAZ:	Height for Age Z scores
HH:	Household
HHS:	Household Hunger Scale
IPC:	Integrated Phase Classification
IPC-AMN:	Integrated Phase Classification – Acute Malnutrition
IRNA:	Inter-Agency Rapid Needs Assessment
IYCF:	Infant and Young Child Feeding
LCS:	Livelihood Coping Strategies
MAM:	Moderate Acute Malnutrition
MAD:	Minimum Acceptable Diet
MDD:	Minimum Dietary Diversity
MM:	Millimeter
MOH:	Ministry of Health
MUAC:	Mid Upper Arm Circumference
NBeG:	Northern Bahr El Ghazal
NIWG:	Nutrition Information Working Group
OTP:	Out-Patient Therapeutic Programme
PLW:	Pregnant and Lactating Women
PPS:	Probability Proportional to Size
RC:	Reserve Cluster
RRC:	Relief and Rehabilitation Commission
SAM:	Severe Acute Malnutrition
SD:	Standard Deviation (measure of spread around the mean)
SMART:	Standardized Monitoring and Assessment of Relief and Transitions
SMOH:	State Ministry of Health Aweil West County
TEM:	Technical Error of Measurement
TSFP:	Targeted Supplementary Feeding Programme
U5MR:	Under Five Mortality Rate
UNHCR:	United Nations High Commissioner for Refugees
UNICEF:	United Nations International Children's Emergency Fund
Vit A:	Vitamin A
WASH:	Water Sanitation and Hygiene
WFH:	Weight for Height
WHO:	World Health Organization
WHZ:	Weight for Height Z Scores

Executive Summary

Between March 11 and 17 of 2025, a SMART survey was conducted across all nine Payams (Achana, Ayat Center, Ayat East, Ayat West, Gomjuer Center, Gomjuer East, Gomjuer West, Mariem East and Mariem West) in Aweil West County, Northern Bahr El Ghazal State, South Sudan. The survey employed a two-stage probability sampling that ensures representativeness of the target population: first, villages were identified using the probability proportional to population size (PPS) method of cluster sampling, then, households were selected using simple random sampling.

Anthropometric data was collected from 544 children aged 6-59 months from 389 households in 33 clustered villages in Aweil West County and their nutritional status analyzed. Since the final sample size exceeded the minimum 438 children required as per the applied sampling methodology in the validated protocol, there was no need to activate any reserve clusters.

The Global Acute Malnutrition (GAM) prevalence based on weight for height z score (WHZ) and/or Oedema was estimated at 16.7% (95% CI: 13.7 – 20.2), placing the county in a critical phase according to WHO thresholds and IPC AMN classification. Severe Acute Malnutrition (SAM) was recorded at 3.9% (95% CI: 2.8 – 5.5). The nutrition situation remains precarious, with the GAM level having deteriorated from the Serious phase reported in the last SMART survey conducted in January 2020 (13.8% GAM) to the current Critical phase, signaling a worsening trend in acute malnutrition in the county.

The Crude Death Rate (CDR) was 0.34 per 10,000 persons per day (95% CI: 0.14 – 0.85), and the Under-5 Mortality Rate (U5MR) was 0.00, both well below emergency thresholds, indicating relatively stable mortality situation during the recall period.

Table 1: Executive summary table

Category	Indicator	n	N	(%) (95% CI)
Wasting	Prevalence of global malnutrition by WHZ (<-2 z-score and/or oedema)	89	534	16.7 (13.7 – 20.2)
	Prevalence of severe malnutrition (<-3 z-score and/or oedema)	21	534	3.9 (2.8 – 5.5)
	Prevalence of global malnutrition by MUAC (< 125 mm and/or oedema)	43	544	7.9 (5.7 – 10.8)
	Prevalence of severe malnutrition (< 115 mm and/or oedema)	7	544	1.3 (0.6 – 2.9)
	Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	103	544	18.9 (15.9 – 22.4)
	Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	25	544	4.6 (3.4 – 6.2)
Stunting	Prevalence of stunting (<-2 z-score)	NA	NA	13.2 calculated with SD of 1
Underweight	Prevalence of underweight (<-2 z-score)	120	535	22.4 (19.0 – 26.3)

	Prevalence of severe underweight (<-3 z-score)	37	535	6.9 (5.0 – 9.6)
Mortality	Crude Death Rate (Deaths/10,000 people/day)	6	1410	0.34 (0.14 – 0.85)
	Under-5 Death Rate (Deaths/10,000 children U5/day)	0	595	0.00 (0.00 – 0.00)
Nutrition and Health Service Coverage	Measles card + mother confirmation (9-59 months)	426	515	82.7 (79.6 – 86.0)
	De-worming (children12-59 months)	375	471	79.6 (75.8 – 83.4)
	Vitamin A Supplementation (6-59 months)	439	551	79.7 (76.2 – 83.1)
Maternal Nutrition	Pregnant and Lactating Women (PLW) GAM	83	19	22.9 (14.5 – 32.5)
IYCF Indicators				
Breastfeeding indicators	Ever breastfed (0-23 months)	121	148	81.8 (75.7 – 88.5)
	Early initiation of breastfeeding (0-23 months)	115	148	77.7 (70.9 – 84.5)
	Exclusive breastfeeding under 6 months (0-5 months)	99	148	66.9 (60.1 – 74.3)
	Continued breastfeeding (12-23 months)	93	128	72.7 (65.6 – 79.7)
Complementary feeding practices	Minimum dietary diversity 6–23 months	32	148	21.6 (14.9 – 28.4)
	Minimum meal frequency 6–23 months	23	148	15.5 (9.5 – 21.6)
	Minimum acceptable diet 6–23 months	9	148	6.1 (2.7 – 10.1)
	Egg and/or flesh food consumption 6–23 months	94	148	63.5 (55.4 – 70.9)
	Sweet beverage consumption 6–23 months	13	148	8.8 (4.7 – 13.5)
	Zero vegetable or fruit consumption 6–23 months	73	148	49.3 (41.2 – 56.8)
Food Security and Livelihoods	Food Consumption Score			
	Acceptable	211	389	54.2 (49.1 – 59.1)
	Borderline	106	389	27.2 (22.6 – 31.4)
	Poor	72	389	18.5 (14.9 – 22.4)
	Household Hunger Scale			
	None	34	389	8.7 (6.2 – 11.6)
	Little	26	389	6.7 (4.4 – 9.3)
	Moderate	299	389	76.9 (72.8 – 80.7)
	Severe	25	389	6.4 (4.4 – 9.0)
	Very Severe	5	389	1.3 (0.3 – 2.6)
	Livelihood Coping Strategies			
	None	63	389	16.2 (12.9 – 19.8)
	Stress	69	389	17.7 (13.9 – 21.6)
	Crisis	115	389	29.6 (25.2 – 33.9)
	Emergency	142	389	36.5 (31.9 – 41.4)

WASH	Water Sources (Improved and unimproved)			
	Improved	270	389	69.4 (64.8 – 73.8)
	Not Improved	119	389	30.6 (26.2 – 35.2)
	Time to collect water			
	Inside the compound	2	389	0.5 (0.0 – 1.3)
	Under 30 minutes	196	389	50.4 (45.2 – 55.5)
	30 minutes to 1 hour	154	389	39.6 (34.2 – 44.5)
	1 hour to half day	34	389	8.7 (5.9 – 11.6)
	Half day	3	389	0.8 (0.0 – 1.8)
	Treatment method			
	boil	6	389	1.5 (0.5 – 2.8)
	chlorine	9	389	2.3 (1.0 – 3.9)
	Filter cloth	35	389	9.0 (6.4 – 11.8)
	none	339	389	87.1 (83.8 – 90.2)
	Latrine usage			
	Pit latrine with slab	14	389	3.6 (1.8 – 5.7)
	Pit latrine without slab	4	389	1.0 (0.3 – 2.3)
	Shared latrine	16	389	4.1 (2.3 – 6.4)
	Communal latrine	5	389	1.3 (0.3 – 2.3)
	None / open defecation	349	389	89.7 (86.4 – 92.3)
	Soap Access			
	Yes, confirmed	38	389	9.8 (6.9 – 12.6)
	Yes, not confirmed	58	389	14.9 (11.6 – 19.0)
	None	293	389	75.3 (71.2 – 79.7)

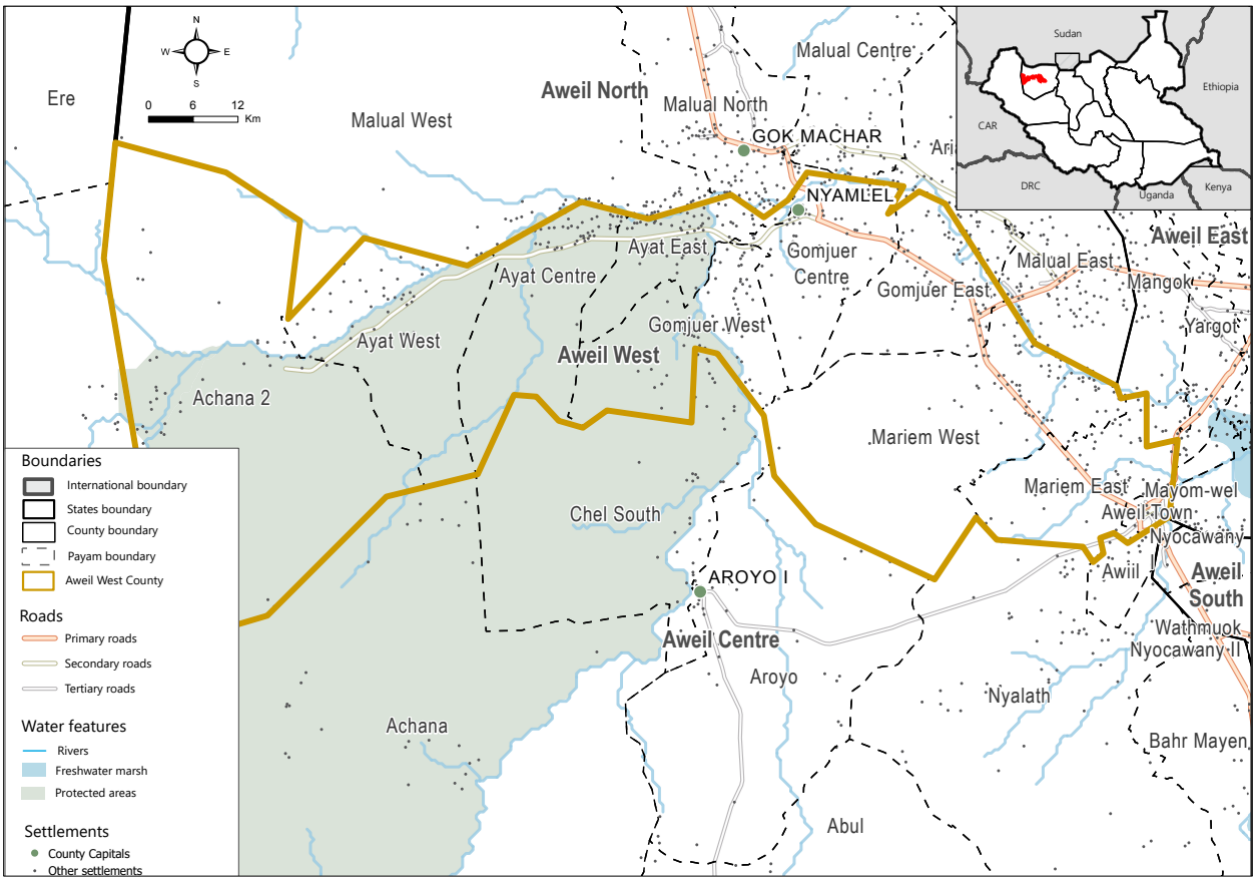
Introduction

South Sudan has faced ongoing conflict and instability since 2013, leading to widespread displacement and chronic food insecurity. Despite the 2018 peace deal improving humanitarian access, as of July 2023, 2.4 million South Sudanese remained refugees in neighboring countries[1], and many displaced internally. According to Integrated Phase classification (IPC) October 2024 data, 6.3 million people (47% of the population) face acute food insecurity (IPC phase 3+), including 1.74 million in Emergency (Phase 4) and 41,000 in Catastrophe (Phase 5), with most these people residing in the states Unity, Jonglei, Northern Bahr El Ghazal and Western Equatoria. According to the IPC-AMN analysis By June 2025, 2.075 million children are projected to suffer from acute malnutrition, including 646,362 to be severely malnourished (SAM) [2].

Aweil West county, is located in Northern Bahr El Ghazal state, bordering Aweil North, Aweil East, Aweil Center, and Raja county (Western Bahr El Ghazal). The area lies within the western flood plains livelihood zone, characterized by sorghum and cattle production, swampy terrain, and forest patches. Key livelihoods include livestock rearing, cereal production (sorghum and maize mainly) and trade. The July 2023 closure of the Sudan border due to conflict in Sudan reduced trade, though informal trade continues[3]. Seasonal flooding typically driven by heavy rains from June to August and further exacerbated by riverine overflows from both the Chel and Makadhik rivers, remains a major challenge; in September 2024 according to the Interagency Rapid Needs Assessment (IRNA), around 2,513 households were severely affected and displaced to higher grounds. The county remains in phase 4 (Critical) per the October 2024 IPC Acute Malnutrition (IPC-AMN) analysis, as well as for the first (October 2024-March 2025) and second (April-June 2025) projections periods. The major drivers of acute malnutrition include high disease prevalence, poor sanitation, sub-optimal infant and young child feeding practices, and food insecurity.

[1] https://www.worldbank.org/en/country/southsudan/overview
[2] South Sudan IPC Report 2024/25
[3] https://www.csrf-southsudan.org/county_profile/aweil-west/

Figure 1: Aweil West county reference map



In Aweil West County, the prevalence of Global Acute Malnutrition (GAM) rate based on weight-for-height z-scores (WHZ) was high at a prevalence of 13.8% (10.0 - 18.6, 95% CI), according to the available most recent SMART survey conducted by Concern Worldwide with technical support from REACH in Aweil West County in January 2020[4]. Though the prevalence fell below the World Health Organization (WHO) emergency threshold (15%), recent data from the Food Security and Nutrition Monitoring System (FSNMS) conducted in July 2024 suggested deteriorating nutrition outcomes. Moreover, since the last SMART survey was conducted over 5 years ago[5], there have been an influx of Sudanese refugees and South Sudanese returnees from Sudan into the county, yet limited data on health and nutrition have been gathered. These points indicate a need for another SMART survey to determine the current nutritional status of the population and provide updated, robust data on the food security and public health-related aggravating factors to inform relevant response in the county.

Given the absence of recent SMART surveys in Aweil West County, the parameters of this technical protocol referenced neighboring Aweil North County's SMART survey conducted in March 2024, to calculate the sample size for this survey. The Aweil North SMART survey revealed

[4] Aweil West _ CWW_REACH_SMART_Final Report.pdf
[5] Aweil West _ CWW_REACH_SMART_Final Report, January 2020

a prevalence of GAM rate based on WHZ of 26.0% (21.7 – 30.8, 95% CI)[6], which is above the WHO emergency threshold of 15%. Hence, for the current survey, the prevalence from the FSNMS 2024 finding (21.3%) was adopted while all other parameters were maintained from the Aweil North SMART survey. Findings from the survey will support planning, targeting and response by partners and key stakeholders on the ground, particularly on issues related to nutrition, health, WASH and FSL within the county.

To address the information gap, REACH Initiative conducted a SMART survey in Aweil West County from March 11 to 17, 2025. In order to give program implementers a better understanding of the prevalence of acute malnutrition (AMN) in Aweil West County and its main causes, this survey sought to gather anthropometric and mortality data in addition to important sectoral indicators related to food security and livelihoods (FSL), water, sanitation, and hygiene (WASH), and health. The findings will update existing data, guide programming decisions, and ensure that resources are effectively allocated to mitigate the county's high malnutrition rates and related vulnerabilities.

[6] SMART survey report in Aweil North county, Northern Bahr El Ghazal state, South Sudan, March 2024

Survey Objectives

The overall objective of this survey was to determine the prevalence of acute malnutrition among children 6-59 months, and the retrospective mortality rates to inform humanitarian response with practical recommendations.

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

1. To estimate the prevalence of acute malnutrition, stunting and underweight among children (boys and girls) aged 6 – 59 months in Aweil West County.
2. To estimate the retrospective Crude Mortality Rate (CMR) for the overall population and Under 5 Mortality Rate (U5MR) in all payams of Aweil West County.
3. To estimate the coverage of various immunizations in Aweil West County including:
    - Vitamin A supplementation for children aged 6 – 59 months
    - Deworming for children aged 12 to 59 months
    - Measles vaccination coverage among children aged 9 – 59 months.
4. To assess childhood morbidity and health-seeking behaviors among households with children aged 6 – 59 months in Aweil West County.
5. To assess the nutritional status of pregnant and lactating women (PLW) in Aweil West County.
6. To assess IYCF Practices such as breastfeeding and complementary feeding among mothers who have children under the age of two years in Aweil West County.
7. To assess the WASH situation in Aweil West County (main water source, distance/time to water source, water treatment status, access to soap, access to latrine).
8. To assess the food security and livelihoods situation in Aweil West County [Food Consumption Scores (FCS), Household Hunger Scale (HHS), main livelihoods, and Livelihood Coping Strategies (LCS)].
9. To formulate practical interventions and recommendations for both emergency and long-term programs of Nutrition actors in Aweil West County.

Methodology

This is a quantitative survey that follows the SMART survey protocol, and is representative of the entire population of Aweil West county. A two-stage cluster sampling approach was employed, with probability proportional to population size (PPS) used to select clusters (villages). All villages in Aweil West County were included in the sampling frame and their respective population sizes were considered to provide each sampling unit with equal chances of being selected.

Sampling strategy

For this survey, a two-stage cluster sampling strategy was used to ensure a representative sample, aligning with SMART survey guidelines. In the first stage, villages were selected proportionally to their population size (PPS), giving each village a chance of being chosen based on its relative population. In the second stage, households were randomly selected within each chosen cluster. The final number of households to be surveyed per cluster was determined by the calculation which factors in the daily capacity of each survey team along with other relevant considerations.

Sampling strategy: selection of clusters

The smallest geographic unit used for this study is referred to as a cluster, which is equivalent to a village from the administrative level. A list of all 424 villages, with populations ranging from 49 to 10,231 individuals with a total population of 197,705, was obtained from the Aweil West County Health Department (CHD) and Concern Worldwide. According to the calculation (see Table 5), 33 clusters were required to achieve the desired level of precision. Using the Emergency Nutrition Assessment (ENA) software and applying the Probability Proportional to Size (PPS) method, 33 villages were randomly selected as clusters from the list, along with 4 reserve clusters (RC).

For clusters with more than 150 HHs, segmentation was used to select one portion of the cluster to represent the entire cluster. The segments were chosen using either probability proportional to size (PPS) or simple random sampling (SRS), depending on whether the segment populations sizes were similar or different[7].

Sampling strategy: selection of households

Definition of household for the survey: A household was defined as a group of people living together, who cook and eat from the same cooking pot. Polygamous families were also defined

[7] 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 used.

based on the same principle: if each wife had her own pot, even if they were living in the same compound, they were treated as different households.

Household selection techniques: From the selected villages, one of these two methods was used for household listing: (1) a verbal listing from one or more community leaders and, when not possible, (2) a manual house-to-house listing. Twelve households were then randomly selected from the complete list of HHs using a random number generator (RNG) application.

In selected households, all eligible children (aged 6 – 59 months old) were measured for anthropometric indices, and the household questionnaire was administered. Houses found empty or absent with children were re-visited, and the outcome recorded on the cluster control form, which also noted any empty or non-responding households.

Table 2: Targeted Sample size (Anthropometric)

Parameter	Aweil West County	Justification
Estimated Prevalence (%)	21.3%	April 2024 Aweil North County SMART survey, the GAM rate was reported as 26.0% (21.7 – 30.8, 95% CI). However, FSNMS 2024 resulted in 21.3% and expected to remain the same for period of data collection. Hence, the latter was used.
Desired Precision	4	Reasonable precision for the expected prevalence based on the SMART survey Guideline.
Design Effect	1	The April 2024 Aweil North SMART design effect was 1. This was used as less heterogeneity was expected.
Children to be included	**438**	
Average Household Size	6.1	From Aweil North SMART survey conducted by REACH in April 2024.
% Children Under-Five	24.4%	From Aweil North SMART survey conducted by REACH in April 2024.
% Non-Respondents	3%	Anticipated non-response based on past experiences
Households to be included	**337**	

Table 3: Targeted Sample size (Mortality)

Parameter	Aweil West County	Justification
Estimated death rate per 10,000/day	0.40	The estimated CMR from the Aweil North SMART Survey was 0.40 (0.20-0.77, 95% CI)
Desired Precision	0.35	A reasonable precision for the mortality rate less than 1.
Design Effect	1.5	As per the recommended DEFF according to SMART guideline.
Recall Period	90	A standard recall period of 90 days was used to plan this survey. However, for the analysis the actual recall period of 88 day (from Dec 17, 2024 i.e. the appointment of the new commissioner for the county to Mar 14, 2025) was used for analysis.
Population to be included	**2276**	
Average Household Size	6.1	From Aweil North SMART survey conducted by REACH in April 2024.
% Non-Respondents	3%	Anticipated non-response based on past experiences
Households to be included	**385**	

Since the two different household sample sizes (anthropometric versus mortality) produced different numbers, the mortality sample size with the higher number of households was used for both anthropometry and retrospective mortality survey, with 385 households in Aweil West county to be included in the survey.

Table 4: Calculation of household average per day

Activity	Estimated Time
Departure from Office	**7:30 AM**
a. Daily morning Briefings	*15 min*
b. Travel to villages	*50 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	*50 min*
Total time for HH listing, travelling and breaks (a + b + c + d + f)	175 min
Arrival back to Base	**5:30 PM**
Total Available time in a day	10:00 hrs (600 minutes)
Total time per day for field work (7:30am –5:30 pm) available time for work	600 - 175 minutes = 425 minutes
Time taken to complete one questionnaire	*30 minutes*
Total time per household + e	*35 minutes*

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

425 (min) / 35 (min) = **12.14 HHs/per day ~ 12 HHs**

Accordingly, the number of clusters is presented in table 5 below:

Table 5: Number of clusters

The total number of households in the sample was then divided by the number of households to be completed in one day to determine the number of clusters to be included in the survey. The total number of clusters was obtained after dividing the total number of households.
(385/12) = 32.08 clusters ~ 33 clusters.

	Aweil West
Total number of HHs based on sample size calculation	385
Total number of HHs to be assessed per day per team	12
Clusters needed	32.08
Clusters needed	**33**

Survey teams, training, data collection and data management

Survey teams: Six teams consisting of four members (1 Team Leader, 1 measurer, 1 assistant, 1 enumerator) were involved in the collection of the data. In each cluster, a local guide was employed on site to facilitate data collection at the household level. The survey teams were recruited by REACH with the involvement of partners such as Concern Worldwide and the local officials at both State and County level. To the extent possible, the team members were a mix of both men and women and were recruited from the local communities. Supervisors consisted of a mix of Relief and Rehabilitation Commission (RRC), State Ministry of Health (SMOH), County Health Department (CHD) and REACH staff.

Training: The survey teams were trained for five days between March 5th and 10th, 2025. The training covered various components including basic concepts of malnutrition, taking anthropometric measurements, sampling of households, data collection tools, digital data collection, data quality checks, standardization exercise, pilot test, among other themes. The training of the enumerators was facilitated by SMART certified staff and staff with experience conducting SMART surveys.

Supervision: The overall management of the survey was done by REACH Initiative. Maximum supervision of the survey teams was ensured to facilitate quality data.

Data entry and management: Data was collected through REACH tablets using IMPACT Kobo account. The data collection tools were programmed and installed in the tablets which

were used by the survey teams. The teams uploaded the collected data to a central server on a daily basis for the survey manager to clean and review each day for quality assurance. Feedback was then provided to the teams each morning.

Data quality

In order to ensure optimal and high data quality, several measures were put in place. The main ones included:

a) The survey was done in accordance with the submitted protocol, ensuring the following:
   i. That the training of survey teams was done using standardised material as recommended by SMART Methodology.
   ii. That standardisation test was undertaken as part of the training; taking appropriate steps thereafter based on the performance of the survey teams.
   iii. That appropriate calibration of survey equipment, during the training and on every morning before proceeding to the field for data collection, was followed.
   iv. That plausibility checks were conducted on a daily basis and informed the daily debriefing sessions which were conducted every day.

b) Data was collected through a digital platform with control checks and skip patterns put in place to create a logical flow in the HH questionnaire were programmed to improve the data quality.

c) Anthropometry data was auto analysed using Emergency Nutrition Assessment (ENA) software (January 2020) anthropometry section. The same software was also used to analyse the mortality data.

Questionnaire

The survey was conducted using structured data collection tools which have been developed by the Global SMART Team for both anthropometric and mortality surveys using KoboToolbox. Other indicators were collected using the modules in line with current Food Security and Nutrition Monitoring System (FSNMS) questionnaires as much as possible.

Data collected

1. **Anthropometry (children 6-59 months).**
   - **Age:** determined using birth/health cards/records when available and the local calendar of events (see Appendix 4) which were jointly developed by local leaders and survey enumerators.
   - **Sex:** Male or female

- **Weight:** Children's weights were taken without clothes and sometimes with light clothes using mother and child digital weighing scales (SECA scales with precision of 100gm).
- **Height/length:** Children were measured using the wooden UNICEF measuring boards (precision of 0.1cm). Children less than 2 years of age were measured lying down while those 2 years of age or older were measured standing up.
- **Mid-upper arm circumference:** MUAC measurements were 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 pregnant and lactating women.
- **Bilateral pitting oedema:** Bilateral pitting oedemas were assessed by the application of normal thumb pressure on both feet for 3 seconds.

2. **Demographics and mortality:** Every current household member's age in years, their sex, place of birth, and the date they joined the household were all variables gathered throughout the recall period. The age in years, the sex, and whether the household member was born into the family were gathered for those household members who departed during the recall period of 88 days. Age in years, sex, whether the deceased was born or joined the household during the recall period, estimated cause of death, and place of death were all variables recorded for those who passed away during the recall period of 88 days.

3. **Health interventions data:** Vitamin A supplementation, deworming, and measles immunization data were collected through health cards (when available) or recall of 6 months prior to data collection.

4. **Morbidity:** Two-week retrospective morbidity data was collected from mothers/caregivers of all children (of 6-59 months old) included in the anthropometric survey.

5. **Food Security Indicators:**
    a. **Food Consumption Scores (FCS):** An indicator of the general quantity and quality of foods being consumed in a household, based on how many days any household member has consumed 9 distinct food groups within a 7-day recall period. Households were categorized into categories of severity based on their responses. FCS is often used as a proxy for quality of food consumed. Standard FCS thresholds are <21 for 'poor', 21 to <=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 quantity of food consumed. Thresholds and categories used for analysis are those used for IPC Acute Food Insecurity (AFI) in South Sudan[8].
    c. **Livelihood Coping Strategies (LCS):** Measures behaviours or actions households are taking to cope with not having enough food or resources to get food for the

[8] Household hunger scale categories are 1. Little to no hunger (0-1), 2. Moderate hunger (2-3) and Severe hunger (4-6)

recall period of 30 days. Ten coping strategies were probed for and then categorized as Emergency, Crisis, or Stress coping strategies.

6. **WASH** – indicators on main drinking water source, access to latrines, distance/time to main water source, and water treatment were asked.

Referral: During the collection of these anthropometric data, all children whose measurements indicated they were acutely malnourished, and who were not already enrolled in nutrition treatment programs, were referred to the relevant partners using referral forms to existing Targeted Supplementary Feeding Programme (TSFP) and Outpatient Therapeutic Programme (OTP) programs in the area.

Classifying malnutrition

Individual classification of nutritional status

Individual classifications for nutritional status by different anthropometric measurements are summarized in table 6 below for wasting, stunting, and underweight.

Table 6: Individual malnutrition classifications by WHO

Type of Malnutrition	Grade of Malnutrition	Anthropometric Indicators and Cutoffs
Wasting	Global Acute Malnutrition (GAM) Moderate & severe wasting	<-2 z-scores weight-for-height (WFH) and/or oedema
		<125mm mid-upper arm circumference and/or oedema
		Presence of bilateral pitting oedema
	Severe Acute Malnutrition (SAM) Severe wasting	<-3 z-scores weight-for-height (WFH) and/or oedema
		<115mm mid-upper arm circumference and/or oedema
		Presence of bilateral pitting oedema
Stunting	Global Chronic Malnutrition Global Stunting	<-2 z-scores height-for-age (HFA)
	Severe Chronic Malnutrition Severe Stunting	<-3 z-scores height-for-age (HFA)
Underweight	Global Underweight	<-2 z-scores weight-for-age (HFA)
	Severe Underweight	<-3 z-scores weight-for-age (HFA)
Maternal nutrition	Moderate and severe malnutrition	<230mm mid-upper arm circumference
	Severe acute malnutrition	<210mm mid-upper arm circumference

Population cut-offs for malnutrition

Table 7 below defines the population cut-offs for determining the severity of malnutrition when the prevalence of acute and chronic malnutrition is known. These levels are internationally agreed upon and provide an objective basis for developing responses to increased levels of acute and chronic malnutrition[9]. To interpret proportions at a population level with meaning, absolute numbers are also necessary.

Table 7: WHO/UNICEF Classification for Severity of Malnutrition by Prevalence among Children 6-59 months[10]

LEVELS	PREVALENCE OF THRESHOLDS %		
	WASTING	UNDERWEIGHT	STUNTING
Very low	<2.5%	<2.5%	<2.5%
Low	2.5- <5%	2.5- <5%	2.5- <10%
Medium	5- <10%	5- <10%	10- <20%
High	10- <15%	10- <15%	20- <30%
Very high	>=15%	>=15%	>=30%

Table 8: integrated Phase Classification of Acute malnutrition (IPC AMN) classifications for severity of malnutrition prevalence among children 6-59 months[11]

<table>
<tr><th rowspan="2">IPC AMN Phase Classification</th><th colspan="3">PREVALENCE OF THRESHOLDS %</th></tr>
<tr><th>WASTING by GAM by Weight for Height z-score</th><th>WASTING by GAM by Mid-Upper Arm Circumference[12]</th><th>Priority Response Objective</th></tr>
<tr><td>Acceptable</td><td><5%</td><td rowspan="2"><5%</td><td>Maintain the low prevalence of acute malnutrition</td></tr>
<tr><td rowspan="2">Alert</td><td rowspan="2">5- <10%</td><td rowspan="3">Strengthen existing response capacity and resilience. Address contributing factors to acute malnutrition. Monitor conditions and plan response as required</td></tr>
<tr><td rowspan="2">5 - <10%</td></tr>
<tr><td>Serious</td><td>10- <15%</td><td rowspan="2">Urgently reduce acute malnutrition levels through scaling up treatment and prevention of affected populations</td></tr>
<tr><td rowspan="2">Critical</td><td rowspan="2">15- <30%</td><td>10 - <15%</td></tr>
<tr><td>>= 15%</td><td>Urgently reduce acute malnutrition levels through significant scale up and intensification of treatment and protection activities to reach additional population reached</td></tr>
</table>

[9] *Physical Status: The use and interpretation of Anthropometry. Report of a WHO expert committee, 1995. Chapter 5, p208 & 212*

[10] *Threshold classification according to WHO 2018*

[11] *Threshold classification according to IPC Acute Malnutrition reference tables*

[12] IPC AMN classification by MUAC should only be done in the absence of GAM by WHZ data. Whether a higher or lower IPC AMN Phase is classified depends on the historical relationship between WHZ and MUAC in the unit of analysis. See IPC AMN Guidance for more details.

Extremely Critical	>=30%		Urgently reduce acute malnutrition levels through addressing widespread acute malnutrition and disease epidemics by all means

Data cleaning and analysis

The anthropometric and mortality data was analysed using ENA for SMART (January 2020 version). The other additional data (immunization, maternal nutrition, morbidity etc.) were analysed using R. Various statistics were computed on the data, including percentages, means, and medians among others. The analysed data was presented in both tabular and graphical form. The preliminary datasets were made available within 7 days after the last day of data collection, and the preliminary report within 14 days. The preliminary report goes through REACH validation processes and was also submitted to the Nutrition Information Working Group (NIWG) for validation. During the data collection exercise, daily quality checks were performed to ensure the process was running smoothly and that enumerators were well trained on the procedures to be performed. Moreover, specific checks on the anthropometric and mortality results were carried out, specifically the following:

- **Verify flagged children's data –** Input the anthropometric data into ENA and run the plausibility report. This should identify children without key measurements and, consequently, z-scores for further verification. If the data of a flagged child cannot be corrected, the entry remains in the dataset as it contributes to overall quality score of the data.
- **Cleaning extreme MUAC values –** MUAC values <5cm or >20cm or probable errors were removed for children 6-59 months.
- **Cleaning reported deaths –** During data analysis, all reported deaths were reviewed for consistency with the recall period. Only deaths that occurred within the 88-day recall period (from December 17, 2024 i.e. the appointment of the new commissioner for the county , to March 14, 2025) were included in the analysis. Any deaths reported to have occurred outside this timeframe were excluded, ensuring accurate mortality rate estimates aligned with the survey protocol.

Results

A total of 389 households, representing 2,005 individuals, were included in the survey, with an average household size of 5.2 people. Among the surveyed households, 95% had children under five years old, resulting in 544 children included in the survey. Female-headed households made up 55% of the sample, while the remaining 45% were male-headed.

Table 9: Survey target, sample and non-response

	Target	Achieved		Absent		Refused	
	N	N	% of Target	N	% of Target	N	% of Target
Children	438	544	124	0	0	0	0
Households	385	389	101	7	1.8	0	0
Villages	33	33	100	N/A	N/A	N/A	N/A

Anthropometric Results

Of the 33 villages surveyed in Aweil West County, 544 children aged 6 – 59 months (278 boys and 266 girls) were measured to assess malnutrition status.

To identify outliers, the data were checked at ±3 standard deviations from the observed mean; any values flagged as not plausible for height, weight, or age by the SMART software were excluded from the analysis (though retained in the dataset). These SMART flags were excluded from the analysis but not from the data. **In total, 10 data points were flagged for the weight-for-height z-score, hence, the date for 534 children were analyzed. Similarly, 535 children were analyzed for weight-for-age (excluding 9), and 508 for height-for-age (excluding 36).** This analysis was conducted using WHO 2006 standards.

Table 10: Distribution of age and sex of sample

	Boys		Girls		Total		Sex Ratio
Age (mo)	**N**	**%**	**N**	**%**	**N**	**%**	Boy:girl
6-17	70	53.0	62	47.0	132	24.3	1.1
18-29	76	56.3	59	43.7	135	24.8	1.3
30-41	55	43.3	72	56.7	127	23.3	0.8
42-53	53	49.5	54	50.5	107	19.7	1.0
54-59	24	55.8	19	44.2	43	7.9	1.3
Total	278	51.1	266	48.9	544	100.0	1.0

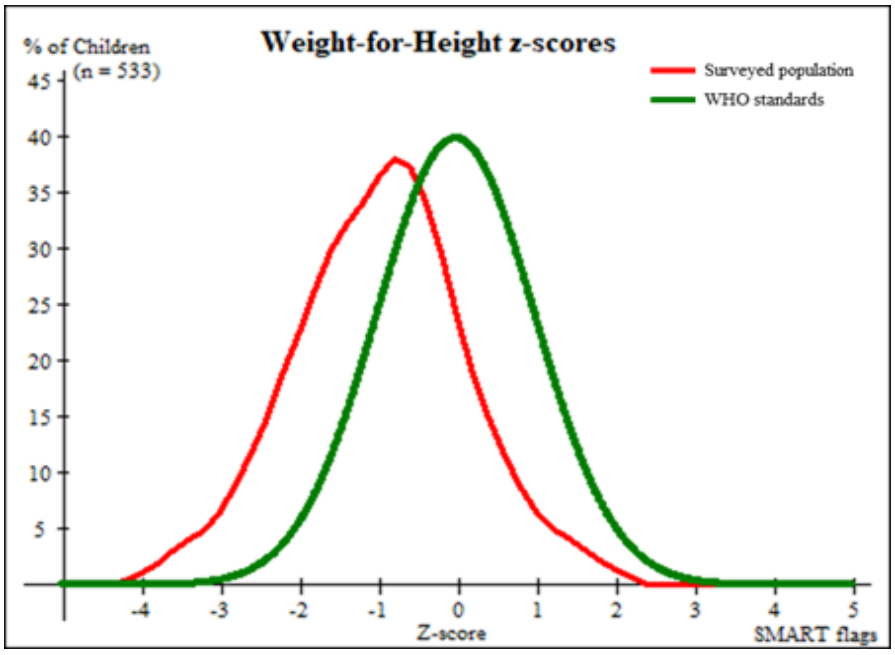
GAM by WHZ

The prevalence of Global Acute Malnutrition (GAM) defined as weight-height Z-score (WHZ) (WHZ<-2 and/or oedema) among children 6-59 months old was estimated at 16.7% (13.7 - 20.2,

95% CI) (see table 11 below), which is **categorized as "Critical" per IPC AMN classification**[13]. A GAM rate falling in the Critical phase requires significant scale-up and intensification of treatment and protection activities to reach additional population affected[14]. In addition, the prevalence of Severe Acute Malnutrition (SAM) per WHZ among children 6-59 months old was 3.9% (2.8 - 5.5, 95% CI). One nutritional bilateral oedema case was observed during the assessment, verified by the supervisor, and referred for further care.

The last SMART survey conducted in the county was in January 2020 by Concern Worldwide and REACH, which reported a GAM rate of 13.8% (10.0 - 18.6, 95% CI). Since then, the only other recent nutrition data was from the FSNMS Round 30 conducted in July/August 2024, which indicated a GAM rate of 21.3%. In comparison, the current survey estimated a GAM rate of 16.7% (13.7 - 20.2, 95% CI). Given the substantial gap in time between the last SMART survey and the current one, no statistical comparison was conducted to determine whether the change in GAM prevalence is significant in the county. Nevertheless, the situation remains precarious, as the GAM level has shifted from the "Serious" to the "Critical" phase based on WHO threshold.

Figure 2: Gaussian curve for Weight-for-Height z-scores



The Weight-for-Height Z-score mean and standard deviation were -0.98 and 1.07, respectively, indicating a higher prevalence of malnourished children compared to the WHO reference population. Measurement quality fell within the recommended range of 0.8 – 1.2 standard deviation, as outlined in the SMART guidelines. The surveyed community demonstrated homogeneity, with a Design Effect (DEFF) of 1.04, signalling relatively consistent nutritional

[13] Integrated Phase Classification (IPC) Technical Manual Version 3.1
[14] ibid

status between villages. Skewness and kurtosis values of -0.01 and -0.02, respectively, suggesting normal distribution.

Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All N = 534		**Boys** N = 275		**Girls** N = 259	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Prevalence of global malnutrition (<-2 z-score and/or oedema)	89	16.7 (13.7 - 20.2)	46	16.7 (12.5 - 22.0)	43	16.6 (12.4 - 21.9)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	68	12.7 (10.1 - 15.9)	34	12.4 (8.8 - 17.2)	34	13.1 (9.5 – 17.8)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	21	3.9 (2.8 - 5.5)	12	4.4 (2.6 - 7.2)	9	3.5 (2.0 - 6.1)

***The prevalence of oedema is 0.2%; only 1 girl was found to have bilateral oedema.**

The overall Global Acute Malnutrition (GAM) rate was 16.7% (with a 95% confidence interval of 13.7% to 20.2%). Notably, the prevalence of Severe Acute Malnutrition (SAM) was slightly higher among boys compared to girls, consistent with global findings[15], whereas Moderate Acute Malnutrition (MAM) appeared to be evenly distributed between the two groups. The overall findings for boys and girls exceed the 15% threshold set by the IPC acute malnutrition 2018[16] for a "Critical" situation as they both fall within the 15% to 29.9% range, corresponding to Phase 4 according to the IPC-AMN.

Table 12: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		**Moderate wasting (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**N**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**

[15] Boys are more likely to be undernourished than girls: a systematic review and meta-analysis of sex differences in undernutrition, PubMed Central, Dec 2020

[16] Integrate Phase Classification, Acute Malnutrition, November 2018

6-17	129	4	3.1	16	12.4	108	83.7	1	0.8
18-29	131	6	4.6	18	13.7	107	81.7	0	0.0
30-41	126	2	1.6	16	12.7	108	85.7	0	0.0
42-53	107	6	5.6	11	10.3	90	84.1	0	0.0
54-59	41	2	4.9	7	17.1	32	78.0	0	0.0
Total	**534**	**20**	**3.7**	**68**	**12.7**	**445**	**83.3**	**1**	**0.2**

When examining the results by age category, both younger (6 – 29 Months) children and older children (30 – 59 months) were almost equally affected by severe and moderate wasting. Each group contributed approximately 50% to both severe and moderate wasting cases.

GAM by MUAC

The Mid-Upper Arm Circumference (MUAC) was also used to measure global acute malnutrition among children 6-59 months. The prevalence of acute malnutrition by MUAC was defined by the proportion of children with MUAC < 125 mm and/or oedema, including Severe Acute Malnutrition (SAM) MUAC < 115 mm and Moderate Acute Malnutrition (MAM) MUAC 115 - <125 mm, based on the South Sudan MUAC cut-offs. The reported GAM by MUAC was 7.9% (95% CI: 5.7%–10.8%) while SAM by MUAC was 1.3% (95% CI: 0.6%–2.9%). Both SAM and MAM by MUAC were notably more prevalent among children aged 6–17 months. However, it should be noted that MUAC measurement tends to detect malnutrition more readily in younger children.

Table 13: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

		All N = 544		**Boys** N = 278		**Girls** N = 266
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Prevalence of global malnutrition (< 125 mm and/or oedema)	43	7.9 (5.7 - 10.8)	20	7.2 (4.7 - 10.9)	23	8.6 (5.5 - 13.3)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	36	6.6 (4.8 - 9.1)	18	6.5 (4.1 - 10.1)	18	6.8 (4.2 - 10.8)
Prevalence of severe malnutrition	7	1.3 (0.6 - 2.9)	2	0.7 (0.2 - 2.9)	5	1.9 (0.7 - 5.3)

(< 115 mm and/or oedema)						

Table 14: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)		**Moderate wasting (>= 115 mm and < 125 mm)**		**Normal (> = 125 mm)**		**Oedema**	
Age (mo)	**N**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
6-17	132	3	2.3	13	9.8	116	87.9	1	0.8
18-29	135	2	1.5	16	11.9	117	86.7	0	0.0
30-41	127	0	0.0	5	3.9	122	96.1	0	0.0
42-53	107	1	0.9	2	1.9	104	97.2	0	0.0
54-59	43	0	0.0	0	0.0	43	100.0	0	0.0
Total	544	6	1.1	36	6.6	502	92.3	1	0.2

This survey confirms that weight-for-height (WHZ) measurements identified more children with acute malnutrition (wasting) than MUAC) measurements. The overall prevalence of malnutrition detected via MUAC was consistently lower than what was found through WHZ. In both methods, severe and moderate wasting were most often found in children aged 6-29 months.

Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) by sex

The combined prevalence of global and severe acute malnutrition based on WHZ and MUAC was assessed among 544 children under five. The table below provides detailed numbers for the combined GAM and SAM by WHZ and MUAC. The reported prevalence of combined GAM and SAM based on WHZ and MUAC cut-offs was 18.9% (15.9 - 22.4, 95% CI) and 4.6% (3.4 – 6.2, 95% CI) respectively.

Table 15: Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex*

		All N = 544		**Boys** N = 278		**Girls** N = 266
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Prevalence of combined GAM	103	18.9 (15.9 – 22.4)	52	18.7 (14.4 - 24.0)	51	19.2 (14.9 - 24.3)

(WHZ <-2 and/or MUAC < 125 mm and/or oedema)						
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	25	4.6 (3.4 - 6.2)	13	4.7 (2.9 - 7.4)	12	4.5 (2.6 - 7.6)

*With SMART or WHO flags a missing MUAC/WHZ or not plausible WHZ value is considered as normal when the other value is available

Table 16: Detailed numbers for combined GAM and SAM

	GAM		SAM	
	n	**%**	**n**	**%**
MUAC	14	2.6	4	0.7
WHZ	60	11.0	18	3.3
Both	28	5.1	2	0.4
Oedema	1	0.2	1	0.2
Total	**103**	**18.9**	**25**	**4.6**

*Total sample size (N)= 544

GAM by WAZ

Underweight, as a nutritional indicator, assesses a child's weight relative to their age. According to the WHO 2006 growth standards, which formed the basis of this analysis, a weight-for-age Z-score falling under -2 SD and above -3 SD is classified as moderate underweight, while a Z-score below -3 SD is considered severe underweight. Study findings here revealed an overall underweight prevalence (both moderate and severe) of 22.4% (95% CI: 19.0 - 26.3), with detailed age and sex breakdowns presented in Tables 18 and 19 respectively. According to WHO standards, the reported prevalence of underweight, at 22.4% (95% CI: 19.0 - 26.3), falls within the "high" classification range (20% to <30%)[17].

The burden of moderate underweight was significantly higher among boys (19.8%, 95% CI: 15.8 – 24.5%) compared to girls (11.1%, 95% CI: 8.0 – 15.1%), suggesting a statistically significant differences based on non-overlapping confidence intervals.

Figure 3: Gaussian curve for Weight-for-Age z-scores

[17] Nutrition Landscape Information System (NLiS), WHO, 2025

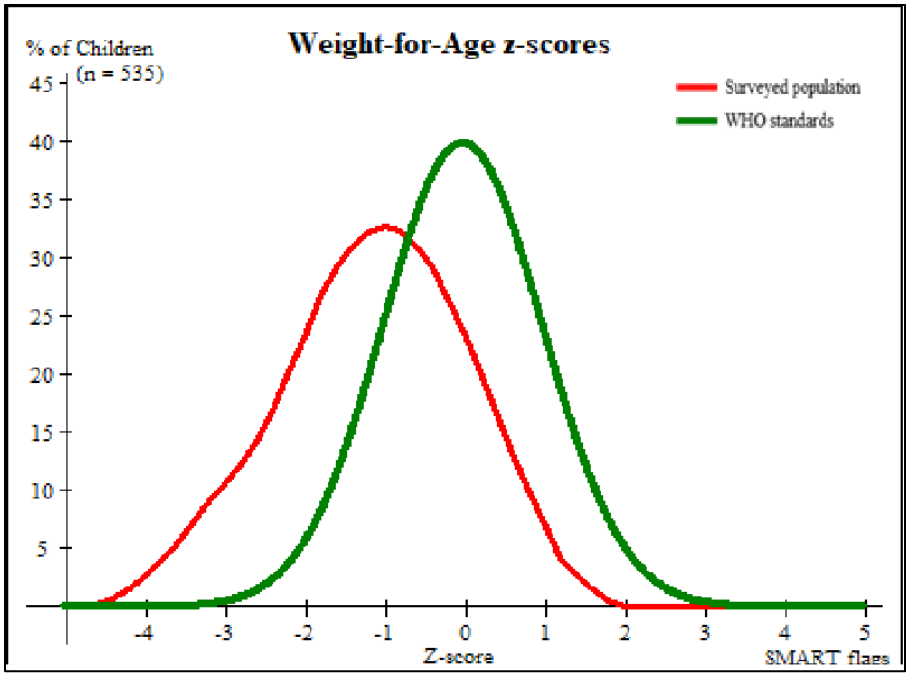


Table 17: Prevalence of underweight based on weight-for-age z-scores by sex

		All N = 535		**Boys** N = 273		**Girls** N = 262
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Prevalence of underweight (<-2 z-score)	120	22.4 (19.0 - 26.3 95% C.I.)	71	26.0 (21.7 - 30.8)	49	18.7 (14.2 - 24.2)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	83	15.5 (12.7 - 18.8)	54	19.8 (15.8 - 24.5)	29	11.1 (8.0 - 15.1)
Prevalence of severe underweight (<-3 z-score)	37	6.9 (5.0 - 9.6)	17	6.2 (3.9 - 9.9)	20	7.6 (4.9 - 11.8)

The overall underweight prevalence was significantly higher on boys than in girls.

Table 18: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and<-2 z-score)		Normal (>= -2 z-score)		Oedema	
Age (mo)	**N**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
6-17	128	9	7.0	15	11.7	104	81.3	1	0.8
18-29	132	12	9.1	25	18.9	95	72.0	0	0.0
30-41	126	9	7.1	20	15.9	97	77.0	0	0.0
42-53	106	4	3.8	13	12.3	89	84.0	0	0.0
54-59	43	3	7.0	10	23.3	30	69.8	0	0.0
Total	535	37	6.9	83	15.5	415	77.6	1	0.2

Prevalence of Stunting

The survey revealed a stunting rate of 13.2% calculated with a SD of 1, which is classified as medium severity (10 to <20%) according to the UNICEF/WHO 2021 classification of stunting. The analysis of stunting based on height for age z-scores was based on a total of 508 children after the exclusion of 36 children, whose z-scores were out of range.

Table 19: Prevalence of stunting based on height-for-age z-scores and by sex

		All N = 508		**Boys** N = 260		**Girls** N = 248
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Prevalence of stunting (<-2 z-score)	103	20.3 (16.7 - 24.4)	63	24.2 (19.2 - 30.0)	40	16.1 (11.6 - 22.0)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	80	15.7 (12.5 - 19.6)	49	18.8 (14.4 - 24.2)	31	12.5 (8.4 - 18.3)
Prevalence of severe stunting (<-3 z-score)	23	4.5 (3.0 - 6.9)	14	5.4 (3.2 - 8.9)	9	3.6 (1.9 - 6.8)

***Calculated prevalence of stunting with an SD of 1 is 13.2%*

The following table (Table 21) presents an analysis of anthropometric data for each indicator, including the design effect, means, standard deviation, and scores outside the expected range. The survey successfully attained the anticipated standard deviation (0.8 – 1.2) for weight-for-height and weight-for-age z-scores.

Table 20: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	533	-0.98±1.07	1.04	1	10
Weight-for-Age	535	-1.14±1.15	1.01	1	8
Height-for-Age	508	-0.88±1.27	1.14	0	36

* contains for WHZ and WAZ the children with oedema.

Death rates and demographic results

Crude and under-five mortality rates can be used to assess the overall severity of the humanitarian crisis and the necessity for a countrywide public health information system. The survey, encompassing 2,005 individuals across all surveyed households, collected mortality data over an 88-day recall period. Specifically, the recall period spanned from December 17, 2024 — identified by the enumerators and local partners as the appointment of the new commissioner for the county — to March 14, 2025, which is the midpoint of data collection. During the interviews, participants were asked to retrospectively report any deaths that occurred in their households during this timeframe.

Table 21: Mortality rates

CMR (total deaths/10,000 people/day): 0.34 (0.14 – 0.85, 95% CI)
U5MR (deaths in children under five/10,000 children under five/day): 0.00 (0.00-0.00, 95% CI)

During the established recall period, participants reported 6 deaths, whereas there was no recorded death for children under five years during the specified recall period. This corresponds to a Crude Death Rate (CDR) of 0.34 (95% CI: 0.14 – 0.85) and an under-five mortality rate of zero. These figures are well below the official emergency thresholds (1/10,000 deaths per day for the total population and 2/10,000 deaths per day for children under five), suggesting that the overall l w security status of the population in Aweil West County is currently stable.

Table 22: General demographic information on mortality sample

Indicator	Results
Average Household Size	5.2
Mid-Interval Population	2,005
% of children Under-5 years	30.3
Birth Rate	1.13
Total Death	6
In-Migration Rate (Joined)	0.4
Out-Migration Rate (Left)	4.14
Design Effect for CDR	1

Table 23: Broad Causes of Death

Cause of death	%
Illness	100
Trauma/Injury	0

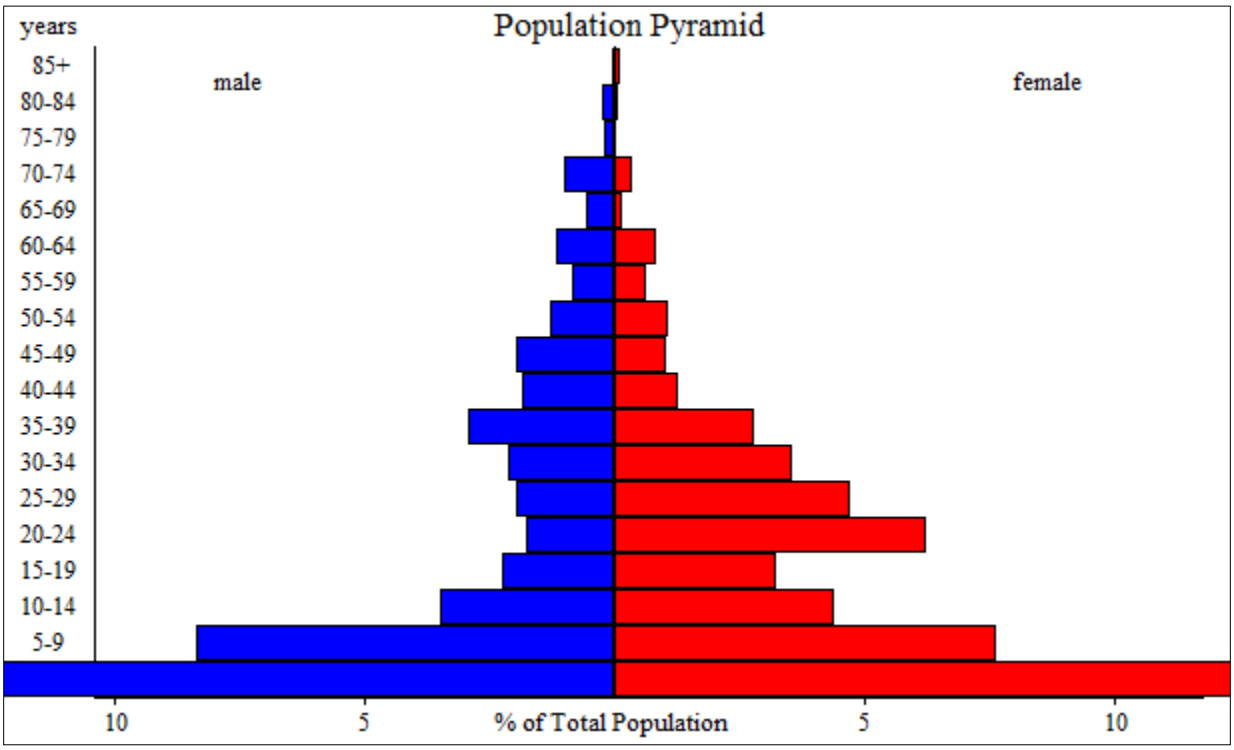
Table 24: Location of death

Location of reported deaths	n	%
Place of Current Residence	5	83.3
During Migration	0	0
Place of Last Residence	0	0
Other	1	16.7

Of the reported deaths, 5 out of 6 occurred in the respondent's current place of residence. On the other hand, all the deaths (6) occurred during the recall period were attributed to illness.

The population pyramid below provides a summary of the population distribution by sex and age groups in Aweil West county.

Figure 4: Surveyed population pyramid for age and sex



Child Morbidity and Access to Health Care

To examine the prevalence of common diseases among children aged 6-59 months, we gathered retrospective morbidity data from the caregivers. This data was collected across a two-week recall period. The survey disclosed that 26.9% (95% CI: 23.3 - 30.6) of these children experienced at least one overall illness episode in the two weeks before data collection. Fever/suspected malaria, diarrhea and cough emerged as the most common illnesses, representing 64.4%, 40.3% and 28.9% of all reported cases, respectively.

Table 25: Prevalence of reported illness in children in the two weeks prior to interview (N= 553, n=149)

Child Illness overall	Prevalence
Prevalence of reported illness	26.9% (23.3 – 30.6, 95% CI)

Table 26: Symptom breakdown among children for whom illness was reported in the two weeks prior to interview (N=149)

Illness type	Prevalence
Fever	64.4% (56.4 – 71.8, 95% CI)

Diarrhoea	40.3% (32.9 – 49.0, 95% CI)
Cough	28.9% (21.5 – 36.2, 95% CI)
Suspected malaria	64.4% (56.4 – 71.8, 95% CI)

In Aweil West County, a about quarter (26.9%, n=149) of the total 553 surveyed children aged 6–59 months had some kind of illness during the two weeks prior to data collection. From those children the majority (92.6%, n=138) were reportedly taken to a health facility by their respective caretakers for treatment. The choice of facilities visited varied based on distance and accessibility. The most common response was to visit a Primary Health Care Centre (62.4%) followed by hospital and traditional healers, each accounting for 12.1% of the response while only a few were taken to private clinics (4%) and mobile clinics (2%). The remaining 7.4% of children reported to have illnesses were not taken to any health facility for treatment.

Table 27: Health care seeking behavior reported by caretakers of sick children 6-59 months of age (N=149)

Treatment Sought	Response
No treatment sought	7.4% (3.4 – 12.1, 95% CI)
Primary Health Care Centre	62.4% (54.4 – 69.8, 95% CI)
Hospital	12.1% (7.4 – 17.4, 95% CI)
Mobile clinic	2.0% (0.0 – 4.7, 95% CI)
Traditional	12.1% (7.4 – 17.4, 95% CI)
Private clinic	4.0% (1.3 – 7.4, 95% CI)

According to national library of medicine study on determinants of wasting published on June 2022, Children of 6-59 months old who had been sick in the two weeks prior to data collection were more likely to be malnourished than their counterparts who had not been ill. Generally, ill children are more at risk of malnutrition than healthy children due to reasons such as reduced food intake, nutrient losses, diseases like measles and malaria, diarrheal diseases and health care access and care practices, etc.[18].

Nutrition and Health Program Coverage

Table 28: Measles vaccination coverage for children 9-59 months (n=515)

	Measles (with card)		Measles (with card or confirmation from mother)	
	n	%	n	%
Vaccinated	89	17.5% (14.2 – 20.8, 95% CI)	426	82.7% (79.6 – 86.0, 95% CI)

[18] National Library of Medicine

Measles vaccination, deworming, and vitamin A supplementation are critical public health interventions, particularly for children, as they play a vital role in preventing illness and promoting overall health. Among the 515 children aged 9-59 months surveyed, 82.7% were reported to have received measles vaccination, though only 17.5% of these cases were confirmed by vaccination card, highlighting a reliance on caregiver recall and the need to strengthen documentation and follow up.

Table 29: Vitamin A (children 6-59 months) and deworming treatment (children 12-59 months) coverage

		Vitamin A Supplementation last 6 months		Deworming Treatment last 6 months
	n	%	n	%
Vaccinated	439	79.7% (76.2 – 83.1, 95% C.I.)	375	79.6% (75.8 – 83.4, 95% C.I.)

Vitamin A supplementation coverage was assessed among 551 children aged 6-59 months. In Aweil West County, the reported coverage was 79.7%, slightly below the WHO-recommended coverage threshold of 80%. Similarly, the proportion of children who received deworming was 79.6%, also falling just short of the WHO standard of 80% coverage[19].

Infant and Young Child Feeding Practice (IYCF)

Undernutrition is estimated to be associated with 2.7 million child deaths annually or 45% of all child deaths globally. Infant and young child feeding is a key area to improve child survival and promote healthy growth and development. The first 2 years of a child's life are particularly important, as optimal nutrition during this period lowers morbidity and mortality, reduces the risk of chronic disease, and fosters better development overall.[20].

The findings of the survey are presented in the following tables, graphs, and discussions. Information on child feeding practices was gathered for all children aged 0–23 months and analyzed as described below. The sample sizes obtained for Infant and Young Child Feeding (IYCF) practices in this survey were small (N=148), so the results should only be viewed as indicative rather than representative of the broader population's knowledge and practices.

In this survey, mothers/caretakers of 148 children aged 0–23 months were interviewed regarding their children's IYCF practices, following the revised indicators for assessing IYCF practices by

[19] The Sphere Handbook 2018

[20] Infant and Young Child Feeding, WHO, December 2023.

WHO & UNICEF (2021)[21]. The survey's findings are presented in the tables, graphs, and discussions that follow.

A summary of all findings is presented in table 31 below.

Table 30: Proxy IYCEF practices

	Indicator	N	n	%	95% CI
Breastfeeding indicators					
1	Ever breastfed (0-23 months)	148	121	81.8	75.7 – 88.5
2	Early initiation of breastfeeding (0-23 months)	148	115	77.7	70.9 – 84.5
3	Exclusive breastfeeding under 6 months (0-5 months)	148	99	66.9	60.1 – 74.3
4	Continued breastfeeding (12-23 months)	128	93	72.7	65.6 – 79.7
Complementary feeding practices					
5	Minimum dietary diversity 6–23 months	148	32	21.6	14.9 – 28.4
6	Minimum meal frequency 6–23 months	148	23	15.5	9.5 – 21.6
7	Minimum acceptable diet 6–23 months	148	9	6.1	2.7 – 10.1
8	Egg and/or flesh food consumption 6–23 months	148	94	63.5	55.4 – 70.9
9	Sweet beverage consumption 6–23 months	148	13	8.8	4.7 – 13.5
10	Zero vegetable or fruit consumption 6–23 months	148	73	49.3	41.2 – 56.8

Ever Breastfed

When mothers were asked whether their children were ever breastfed, out of 148 children surveyed, 81.8% (n=121) reported that they had breastfed their children aged 0-23 months at some point in their lifetime. In addition, 77.7% (n=115) had reportedly been initiated to breastfeeding immediately within one hour of birth, as per WHO recommendation.

Exclusive breastfeeding (EBF)

The WHO Global Strategy for Infant and Young Child Feeding (IYCF) recommends exclusive breastfeeding for infants up to six months of age. Exclusive breastfeeding provides infants with a uniquely tailored, safe, and accessible food source, protecting them from a variety of health risks. Research indicates that infants in low- and middle-income countries who receive mixed feeding (both breast milk and other foods or liquids) before six months are nearly three times

[21] Indicators for assessing infant and young child feeding practices (WHO 2021)

more likely to die than those who are exclusively breastfed[22]. Exclusive breastfeeding also protects against diarrhea, lower respiratory infections, acute otitis media, and childhood overweight and obesity[23].

In Aweil West, 66.9% (n=99, 95% CI: 60.1 – 74.3) of children aged 0–5 months were exclusively breastfed. This figure is lower than the UNHCR's minimum standard for emergency contexts, which requires that at least 70% of infants aged 0–5 months be exclusively breastfed.

Continued breastfeeding

Continued breastfeeding is also vital during illness; while sick children often have little appetite for solid food, continued breastfeeding can help prevent dehydration while also providing the nutrients required for recovery[24].

Accordingly, children aged 12-23 months were assessed based on the recall period of the previous 24 hours and results showed high number of children or 72.7% (n=93, 95% CI: 65.6 – 79.7) had received continued breastfeeding compared against the collective target in 2030 by WHO to reach at least 80%[25].

Minimum Dietary Diversity

WHO guiding principles recommend that children aged 6-23 months are fed a variety of foods to ensure that nutrient needs are met.[26] Food group diversity is associated with improved linear growth in young children. A diet lacking in diversity can increase the risk of micronutrient deficiencies, which may have a damaging effect on children's physical and cognitive development.

In this regard, the survey findings showed that only 21.6% (n=32, 95% CI: 14.9% - 28.4%) of surveyed children received food from at least 5 of the 8 food groups (including breast milk) during the indicated recall period of 24 hours, as per IYCF guideline recommendation. These findings suggest that meals were likely not adequately diverse for most of the children aged 6-23 months, indicating limited nutrient diversity.

Minimum Acceptable Diet

The Minimum Acceptable Diet (MAD) is a measurement of how well children aged 6–23 months are fed. It is a combination of minimum dietary diversity and minimum meal frequency. According to the survey results in Aweil West, just 6.1% (n=9, 95% CI: 2.7 – 10.1) of surveyed children aged 6–23 months received a minimum acceptable diet, while 15.5% (n=23, 95% CI: 9.5 – 21.6) met the minimum meal frequency in the 24 hours prior to data collection. These findings should be interpreted with caution due to the small sample size of N=148 children assessed.

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[22] Guidelines on optimal feeding of low birth-weight infants in low- and middle-income countries (who.int)

[23] ibid.

[24] ibid

[25] Increasing commitment to breastfeeding through funding and improved policies and programmes, WHO and UNICEF 2019

[26] WHO (2005): Guiding principles for feeding non-breastfed children 6-24 months of age

Women's Nutritional Status by MUAC

Maternal malnutrition refers to the inadquate nutritional status of women during pregnancy and breastfeeding. It is a significant public health issue, especially in low – and middle – income countries, and has profound implications for both maternal and child health.

A total of 83 pregnant and/or lactating women (PLW) were measured using MUAC to determine their nutritional status. This is particularly critical because malnourished PLW may be, on top of the nutritional deficit impacting their health, unable to meet the nutritional needs of their infants, particularly those under six months of age. Among these PLW assessed, about 45.8% were lactating, 44.6% were pregnant, and 9.6% were both pregnant and lactating. As shown in Table 32, 22.9% of women surveyed (n=19) had a MUAC measurement below 230 mm, indicating a critical nutritional status, while the remaining 77.1% of PLW displayed a normal nutritional status.

Table 32: MUAC status among PLW

	MUAC for PLWs	n	Proportion (%)
Severe Acute Malnutrition	<21.0 cm	4	4.8%
Moderate Acute Malnutrition	<23.0 cm	15	18.1%
Normal	≥ 23.0 cm	64	77.1%

Contributing Factors

Water, Sanitation, and Hygiene (WASH)

The WASH indicators presented in this section were assessed at the household level across all surveyed households (N=389), providing representative results for Aweil West County with a 95% confidence level. These indicators reflect household level practices and access to water, sanitation and hygiene services, providing critical insights into environmental health conditions that directly impact the nutrition and well-being of the population.

Source of Drinking Water

Improved Water, Sanitation, and Hygiene (WASH) practices are crucial for both nutrition and overall health, as they prevent diseases like diarrhea and parasitic infections, which can lead to malnutrition and stunted growth, while also reducing the spread of infectious diseases[27].

During the assessment, households were asked a series of systematically organized, closed-ended questions to determine whether their water sources were improved or unimproved, with

[27] Water Sanitation and Hygiene, WHO 2025

responses automatically coded in the database. In Aweil West County, most households (69.4%, n=270, 95% CI: 64.8–73.8) reported fetching water from improved sources. Among these sources, the majority of respondents (65.3%) indicated a borehole as their primary water source.

Table 31: Main source of drinking water

Water source	Type	n	Percent	95%, C.I.
Borehole	Improved	254	65.3	60.7 – 69.7
Protected well	Improved	16	4.1	2.3 – 6.2
Unprotected well	Unimproved	66	17.0	13.6 – 20.8
Surface water	Unimproved	51	13.1	9.5 – 16.5
Other	Unimproved	2	0.6	0.0 – 0.8
Total		389	100.0	

Time to collect water

Another significant indicator considered for the source of drinking water is the time it takes households to collect water which includes travel to and from the water source as well as the time spent collecting water. However, It is important to note that variations between villages in terms of distance were not included or taken into account during the analysis.

In this survey, half of the respondents (50.4%) reported being able to access their main household's water source in under 30 minutes. This was followed by 39.6% of households stating they could reach their source within 30 minutes to under 1 hour. However, 8.7% of households reported having to travel for more than an hour to half a day to obtain water from their main source.

Water treatment used

In Aweil West, the vast majority of interviewed households (87.1%, n=339, 95% CI: 83.8–90.2) reported not treating their water before consumption. A small proportion (9%, n=35, 95% CI: 6.4–11.8) indicated that they use cloth filtration to treat collected water, regardless of whether it comes from an improved or unimproved source. Only 2.3% of households reported using chlorine, while 1.5% reported boiling water as a treatment method.

Hygiene and sanitation

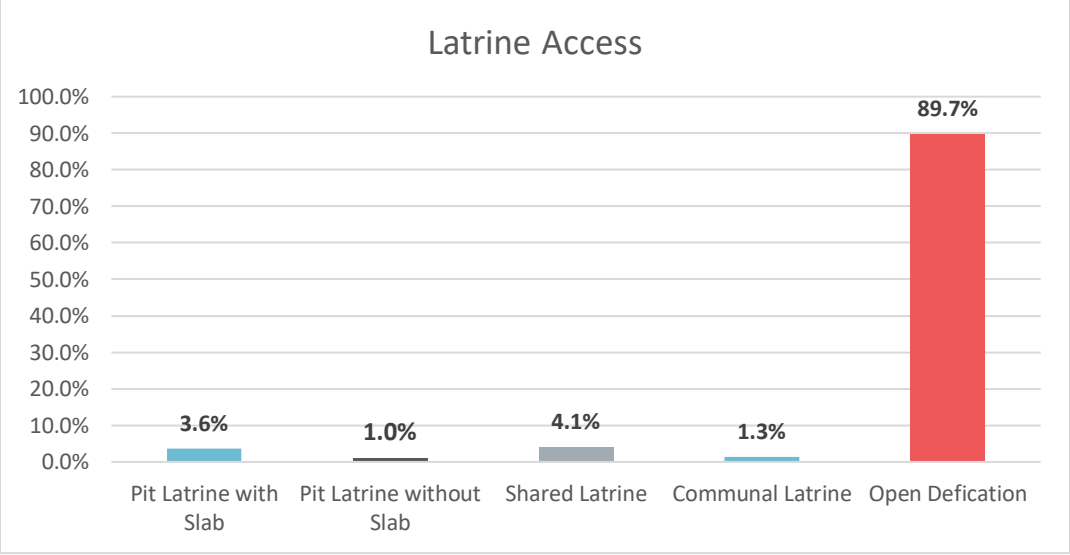
Poor sanitation and hygiene significantly contribute to malnutrition, particularly in children, by increasing the risk of diarrheal diseases, intestinal worms, and environmental enteric dysfunction, which hinder nutrient absorption and overall development[28].

[28] Undernutrition and Water, Sanitation and Hygiene, WaterAid 2015

When households were asked about their latrine access, the overwhelming majority (89.7%, n=286, 95% CI: 49.0–57.4) reported not having access to a safe latrine facility and thus practiced open defecation. Among the remaining few households, 4.1% reported using shared latrines, 3.6% had access to pit latrines with slabs, and 1.3% used communal latrines. Please refer to Figure 6 for more details.

Similarly, handwashing with soap can disrupt the cycle of diarrhea and undernutrition[29] and is particularly crucial for study participants to adopt given the current ongoing cholera outbreak in Aweil West[30]. According to the survey findings, only 14.9% of households (n=58, 95% CI: 11.6–19.0) reported having soap, although this was not verified by enumerators. In contrast, only 9.8% (n=38, 95% CI: 6.9–12.6) of households were confirmed by enumerators to have soap available for use. Alarmingly, the majority of households (75.3%, n=293, 95% CI: 71.2–79.7) reported no access to soap, an especially concerning finding given the ongoing cholera outbreak in the area As of the time of this report, the ongoing cholera outbreak in Aweil West has recorded 4,441 suspected and confirmed cases, including 4 culture-confirmed cases and 4 deaths, with an overall case fatality rate (CFR) of 0.1%, according to WHO South Sudan Cholera Dashboard. This underscores the urgent need for intensified hygiene promotion and soap distribution efforts to mitigate the risk of further disease spread.

Figure 5: Percentage of households per type of latrine they reported having access to (N=389)



[29] Why Handwashing. Global Handwashing Partnership
[30] South Sudan Cholera Dashboard, WHO

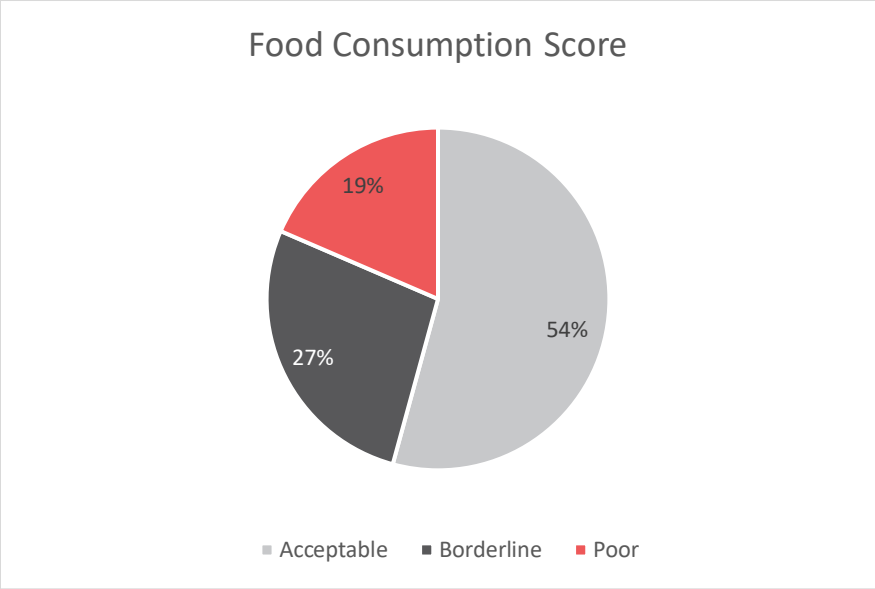
Food Security and Livelihoods (FSL)

Food Consumption Score

The Food Consumption Score (FCS) is a food security indicator that assesses household food consumption by accounting for the diversity, frequency, and nutritional value of foods consumed over a 7-day recall period. Based on this indicator, households are categorized into three groups: poor consumption (FCS = 0 to 21), borderline consumption (FCS = 21.5 to 35), and acceptable consumption (FCS > 35.0).

Among the 389 households surveyed, just over half (54.2%, n=211) had an acceptable food consumption score. The remaining households were categorized as having borderline (27.2%, n=106) and poor (18.5%, n=72) food consumption scores, indicating that a substantial proportion of the population faces food insecurity challenges.

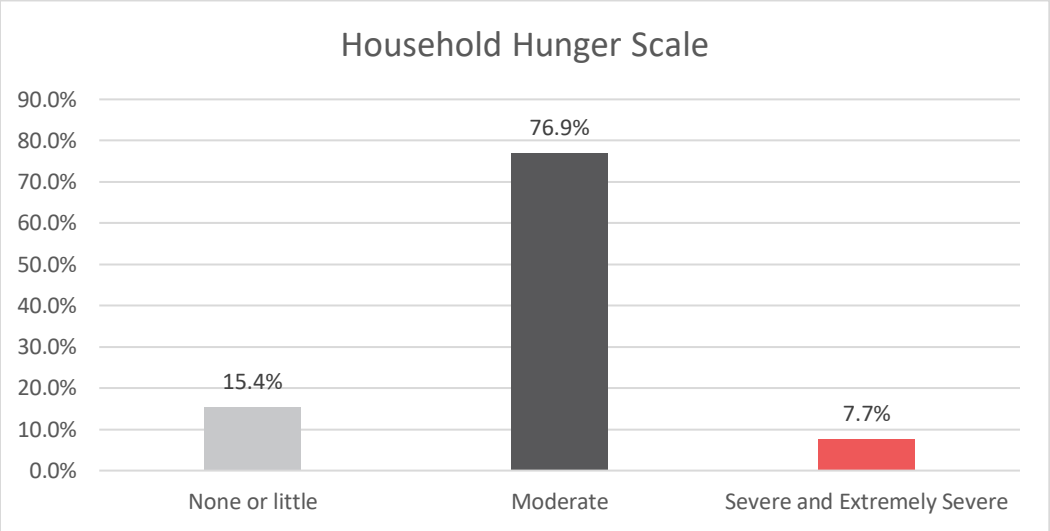
Figure 6: Percentage of households per FCS category (N=389)



Household Hunger Scale (HHS)

A 30-day (4-week or 1-month) recall period was used to assess the Household Hunger Scale, which revolves around three questions regarding households' perceptions of hunger at varying degrees (never, rarely/sometimes, or often). As illustrated in Figure 8 below, the majority of households (76.9%) reported experiencing moderate hunger, while very few households (7.7%) indicated severe or extremely severe hunger in the 30 days prior to the survey.

Figure 7: Percentage of households per HHS category (N=389)

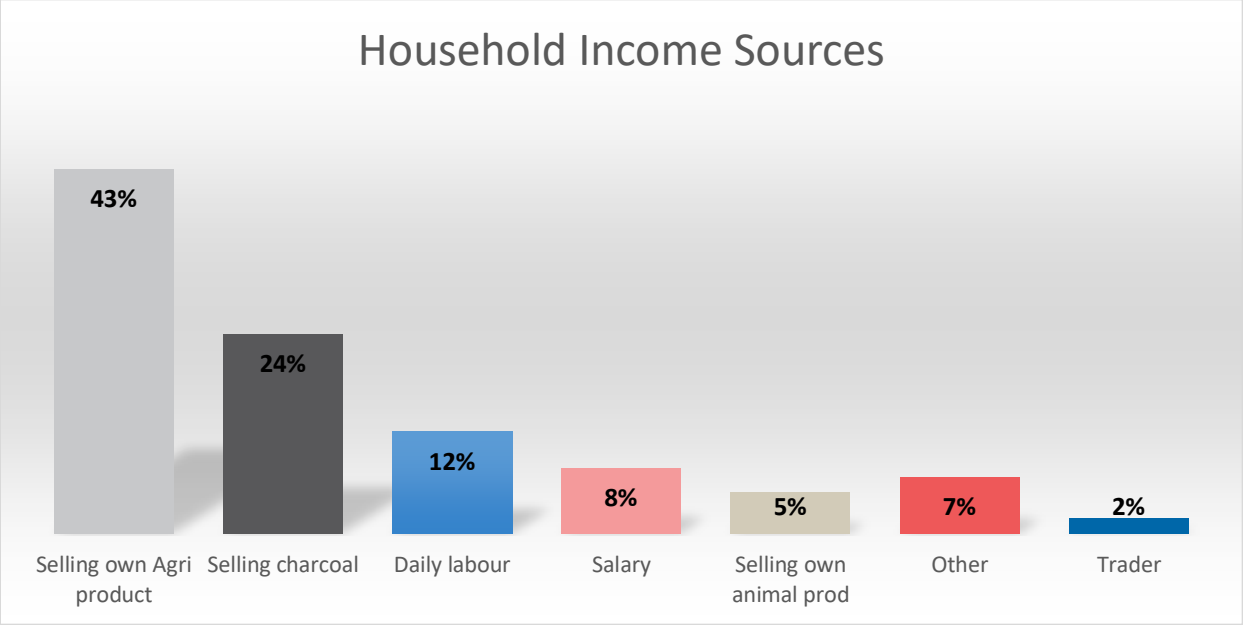


Household Income Source

Over the last three months, the most common income-generating activities among surveyed households included the sale of own-produced agricultural products and sale of collected firewood, charcoal, and wild foods, which together accounted nearly half of all responses (43.2%, n=168) and (23.7%, n=92) respectively. These were followed by daily labor in agriculture, which is also a significant source of income with 12.1% (n=47) of the responses.

About one-third (33.4%) of the sampled households reported having experienced some type of shock in the six months preceding the survey. Of these, the most common were unusually high food prices (45%, n=59), flood-related shocks (38%, n=50) and serious illness (8%, n=10).

Figure 8: Household Income Source (n=389)



Discussion

Nutritional status

The March 2025 SMART survey conducted in Aweil West County revealed a Global Acute Malnutrition (GAM) prevalence of 16.7% (95% CI: 13.7–20.2%), indicating a "Critical" nutritional situation according to WHO and IPC AMN classification thresholds. The Severe Acute Malnutrition (SAM) rate stood at 3.9% (95% CI: 2.8–5.5%), further emphasizing the county's elevated nutrition vulnerability. While this GAM rate is lower than the FSNMS 2024 estimate (21.3%), it marks a deterioration compared to the last SMART survey conducted in January 2020 (13.8%, 95% CI: 10.0–18.6%), moving the county from the "Serious (10 – 14.9% GAM)" to "Critical (15 – 29.9% GAM)" phase. However, due to the significant time gap between surveys, no statistical comparison was conducted.

Both younger (6–29 months old) and older (30–59 months old) children were equally affected by acute malnutrition, each by about 50% to the burden. , The prevalence was slightly higher among boys, though moderate wasting appeared equally distributed.

MUAC-based findings showed a GAM prevalence of 7.9% and SAM of 1.3%, confirming that weight-for-height (WHZ) measurements captured more malnourished children compared to MUAC. The combined GAM based on WHZ and MUAC was 18.9%, and SAM at 4.6%. This reinforces the need for integrated screening using both indicators.

The underweight prevalence was 22.4%, falling in the "high" category as per WHO standards[31], and stunting was recorded at 13.2% (SD-calibrated), indicating a "medium" severity. These findings reflect chronic and acute food insecurity, poor feeding practices, and health challenges facing children in the county. The significantly higher prevalence of moderate underweight among boys, who are approximately 1.8 times more affected than girls, may indicate gender-based vulnerabilities in nutrition outcomes.

Despite the presence of some humanitarian actors supporting nutrition, health, WASH and food security interventions in Aweil West, partner coverage remains limited and may not be sufficient to meet the scale of needs identified in this assessment. The potential reduction or discontinuation of services in certain locations raises concerns about the continuity of critical nutrition programming, particularly in hard-to-reach or flood prone areas. Given the high GAM prevalence, poor IYCF practices, inadequate WASH conditions, and food insecurity, any disruption in essential services delivery could further exacerbate the already critical nutrition situation.

[31] Malnutrition in children, WHO 2025

Mortality

The Crude Mortality Rate (CDR) was 0.34 per 10,000 people per day (95% CI: 0.14 – 0.85), and no under-five deaths were recorded in the recall period. Both indicators remain well below the emergency thresholds, suggesting relative stability in mortality trends, despite high GAM prevalence. This likely reflects functioning health services for life-threatening conditions but highlights underlying vulnerability to malnutrition and disease.

Child Health and Program Coverage

Morbidity data showed that 26.9% of children had an illness in the two weeks prior to data collection, with fever (64.4%) and diarrhea (40.3%) being most common. Although 92.6% of sick children were reportedly taken to a health facility, the link between morbidity and acute malnutrition remains strong. Frequent episodes of illness, particularly diarrhea, can impair nutrient absorption, increase nutrient losses, and reduce appetite, contributing directly to weight loss and poor growth. Similarly, febrile illnesses often lead to increased metabolic demands while limiting food intake, further predisposing children to wasting[32]. In the context of Aweil West, where access to safe water and adequate sanitation is limited, repeated illness not only exacerbates acute malnutrition but also undermines recovery efforts, even when treatment services are available.

Coverage of key interventions was relatively high with Vitamin A supplementation (79.7%), deworming (79.6%), and measles vaccination (82.7%) all close to or slightly below WHO standards. However, the low coverage confirmation by card (17.5%) indicates a need to improve documentation and monitoring. Despite relatively good coverage, malnutrition remains high, underlying the need for more integrated preventive approaches.

Infant and Young Child Feeding (IYCF) Practices

Findings point to suboptimal IYCF practices. Although 66.9% of children under six months were exclusively breastfed, this falls short of the 70% minimum emergency standard[33]. Only 6.1% of children aged 6 – 23 months met the minimum acceptable diet (MAD), and 21.6% met minimum dietary diversity (MDD), indicating inadequate feeding quality and frequency, which might also contribute to the high rates of malnutrition. These low-level practices might be associated with poor or non-existent IYCF counselling at both health facility and community levels. Additionally, the lack of structured mother support groups or peer counselling networks may have contributed to limited promotion and support of exclusive breastfeeding. Furthermore, the absence or weak integration of IYCF messaging into routine nutrition, health, and protection services might have resulted in fragmented communication and insufficient reinforcement of optimal IYCF behaviors.

[32] The State of World's Children, UNICEF 2007
[33] Infant And Young Child Feeding Threshold: Emergency Handbook, UNHCR 2021

WASH and Food Security

Water, sanitation and hygiene conditions were poor. A vast majority of households reported inadequate WASH practices, with 87.1% of households reported no water treatment, and 89.7% had no access to safe latrines, resulting in widespread open defecation. Only 9.8% of households had soap confirmed by enumerators. These poor WASH conditions are particularly alarming given the ongoing cholera outbreak[34], and pose a major risk to child health and nutrition.

Food security findings showed that 45.8% of households had borderline or poor food consumption score (FCS), and 76.9% reported moderate hunger, while 7.7% reported to have severe or extreme severe hunger according to the Household Hunger Scale (HHS). These figures reflect limited food quantity and diversity, further contributing to nutrition vulnerabilities.

[34] South Sudan Cholera Dashboard, WHO

Conclusions

The March 2025 SMART survey findings indicate that Aweil West County is facing a Critical nutritional situation, with a GAM rate of 16.7% and SAM rate of 3.9%. the survey also found a high prevalence of underweight (22.4%) and moderate levels of stunting (13.2%) suggesting both acute and chronic nutrition challenges. While mortality indicators are below emergency thresholds, the combination of poor IYCF practices, high child morbidity, inadequate WASH conditions, and food insecurity underscores the need for urgent and sustained multi-sectoral action.

The data highlights the pressing need for scale-up of lifesaving nutrition interventions, improved access to health services, strengthened WASH infrastructure, and enhanced food security and livelihood support. Interventions must prioritize children under two, pregnant and lactating women, and communities in hard-to-reach or flood prone areas. Greater investment in behavior change communication on IYCF and hygiene practices, and improved supply chain management for essential nutrition and health commodities, is essential to prevent further deterioration and build long-term resilience. Moreover, given the uncertainty around the continuity of nutrition service delivery in Aweil West, it will be important to ensure that any potential gaps in service provision are bridged to prevent further deterioration of nutrition, health, WASH outcomes. Continued delivery of life-saving interventions by implementing partners is essential, as any interruption in programs and services could impact/accelerate malnutrition rates among the most vulnerable children and households already experiencing critical GAM rates and high levels of hunger.

Recommendations and priorities

Problems Identified	Recommended Actions	Responsible Actors	Timeline
Critical level of acute malnutrition (GAM 16.7%, SAM 3.9%) among children 6–59 months	• Strengthen and scale up TSFP and OTP services to ensure treatment of MAM and SAM cases • Strengthen community-level active case finding, referrals, and follow-up through outreach workers • Prioritize resource allocation to high-burden payams. • Advocate for transition or continuity of services where existing implementing partners may withdraw.	CHD, SMoH, WFP, UNICEF, Partners like Alight and Concern Worldwide	Short Term
High underweight (22.4%) and moderate stunting (13.2%) prevalence	• Implement integrated nutrition-specific and sensitive interventions including food supplementation for vulnerable households. • Promote home gardening and resilience-based programming targeting long-term food and dietary needs.	SMoH, MoA, WFP, NGOs	Medium to Long term
Suboptimal IYCF practices (e.g., MAD 6.1%, MDD 21.6%, EBF 66.9%)	• Strengthen IYCF counselling through health workers and community outreach. • Promote EBF through mother support groups and peer counselling. • Integrate IYCF messaging into nutrition, health, and protection programs.	CHD, SMoH, UNICEF, WFP, Alight.	Medium to Long term
Poor WASH conditions (87.1% no water treatment, 89.7% no latrine access, 75.3% no soap)	• Distribute water treatment products and promote safe storage and usage. • Scale up hygiene promotion and handwashing messaging. • Construct or rehabilitate household latrines, particularly in vulnerable or flooded areas.	UNICEF, WHO, CHD, SMoH, WASH Cluster partners	Short to Medium term

	• Improve soap availability through market or in-kind support.		
Moderate food insecurity (45.8% borderline or poor FCS, 76.9% moderate hunger)	• Expand food assistance (GFD, CBT) to the most vulnerable households. • Promote climate-resilient livelihoods and support returnee/refugee integration. • Integrate food security interventions with nutrition and health services.	WFP, MoA, FAO, NGOs	Short to Medium term
Risk of service disruptions due to implementing partners' funding constraints	• Conduct partner mapping and advocate for resource mobilization and continuity of critical services. • Facilitate handover planning and coordination among partners.	SMoH, UNICEF, WFP, Nutrition Cluster	Immediate to Short term

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We are immensely grateful to the Aweil West community, including village chiefs and randomly selected individuals, who participated in the survey. We deeply appreciate the mothers and caregivers for responding to the questionnaire and allowing their children to be assessed, despite their household duties.

Finally, we commend all survey participants—supervisors, team leaders, enumerators, security focal points in Juba and drivers—whose dedication ensured the successful collection of quality data, even in remote areas requiring lengthy travels.

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Appendices

Plausibility check for: REACH_Aweil_west_county_SMART_Mar_2025.as

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (1.8 %)
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=0.142)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (8)
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** (1.07)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.01)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.02)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.657)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**2** %

The overall score of this survey is 2 %, this is excellent.

Appendix 2 - Assignment of Clusters

Payam	Village	Estimated Population size	Clusters
Gomjuer Center	MarolBboi	1824	1
Gomjuer Center	Akuak Anyuon	482	2
Gomjuer Center	Riangbar	140	3
Gomjuer Center	Mathiang-Riang	502	RC
Gomjuer West	Panrup	382	4
Gomjuer West	Pantit	10231	RC,5
Gomjuer West	Auchier	372	6
Gomjuer West	Akuak Lang	279	7
Gomjuer West	Pinygot	346	8
Achana	Maker Achel	672	9
Ayat West	Nyinbuoli	1585	10
Ayat West	Jukou	907	11
Ayat West	Akuak-Koc	1141	12
Mariem East	Maper Wol	1219	13
Mariem East	Ayendit	2700	14
Mariem East	Nukta	739	RC
Mariem East	Gekou	1218	15
Mariem East	Rumtit	4318	RC
Mariem East	Akuec	289	16
Mariem East	Rum Akuong	501	17
Gomjuer East	Amatnyang	845	18
Gomjuer East	Kajiik	605	19
Gomjuer East	Ameth	1421	20
Ayat Centre	Angol-Leek	597	21
Ayat Centre	Omdurman	73	22
Ayat Centre	Mathiang Abun	365	23
Ayat Center	Angot Aweer	138	24
Ayat East	Bit	291	25
Ayat East	Panlang	596	26
Mariem East	Kuer kou	237	27
Mariem East	Guom	317	28
Mariem West	Mareng	399	29
Mariem West	Tit Amatha	789	30
Mariem West	Thiok Ayur	287	31
Mariem West	Moc Atek	397	32
Mariem West	Akoch	411	33

Appendix 3 – Standardization Test Results

Standardisation test results					Precision				Accuracy		OUTCOME			
Weight		subjects	mean	SD	max	Technical	TEM/mear	Coef of rel	Bias from	Bias from	median		From	From
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			Superviso	Median
	Superviso	10	11.1	1.8	0.4	0.13	1.2	99.5	0	0.06	TEM poor	R value go	Bias good	Bias acceptable
	Enumerat	10	11.1	1.8	0.8	0.22	2	98.6	0.07	0.08	TEM reject	R value ac	Bias acce	Bias acceptable
	Enumerat	10	11.1	1.9	0.5	0.17	1.5	99.2	0.06	0.07	TEM poor	R value go	Bias acce	Bias acceptable
	Enumerat	10	11.1	1.8	0.4	0.13	1.1	99.5	0.07	0.07	TEM poor	R value go	Bias acce	Bias acceptable
	Enumerat	10	10.9	1.9	2	0.71	6.5	86.7	0.29	0.31	TEM reject	R value re	Bias rejec	Bias reject
	Enumerat	10	11.1	1.8	0.8	0.23	2.1	98.3	0.18	0.17	TEM reject	R value ac	Bias poor	Bias poor
	Enumerat	10	11.2	1.9	0.4	0.16	1.5	99.2	0.13	0.11	TEM poor	R value go	Bias poor	Bias poor
	Enumerat	10	11.2	1.8	0.9	0.36	3.2	96.2	0.17	0.16	TEM reject	R value ac	Bias poor	Bias poor
	Enumerat	10	11.1	1.8	0.6	0.2	1.8	98.8	0.11	0.1	TEM poor	R value ac	Bias poor	Bias acceptable
	Enumerat	10	11.2	1.8	0.4	0.17	1.5	99.2	0.1	0.1	TEM poor	R value go	Bias acce	Bias poor
	enum inte	9x10	11.1	1.8	-	0.36	3.3	95.9	-	-	TEM reject	R value acceptable		
	enum inte	9x10	11.2	1.8	-	0.15	1.3	99.4	-	-	TEM acce	R value good		
	inter enun	10x10	11.1	1.8	-	0.24	2.2	97.9	-	-	TEM reject	R value acceptable		
	TOTAL intr	9x10	-	-	-	0.41	3.7	94.7	-	-	TEM reject	R value poor		
	TOTAL+ su	10x10	-	-	-	0.4	3.6	95.2	-	-	TEM reject	R value acceptable		
Height		subjects	mean	SD	max	Technical	TEM/mear	Coef of rel	Bias from	Bias from	median		From	From
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			Superviso	Median
	Superviso	10	87.9	7.7	1.3	0.41	0.5	99.7	0	0.31	TEM acce	R value go	Bias good	Bias good
	Enumerat	10	88.3	8.5	8.2	2.15	2.4	93.6	0.9	0.82	TEM reject	R value po	Bias poor	Bias poor
	Enumerat	10	88.4	7	2.9	0.96	1.1	98.1	1.04	0.76	TEM poor	R value ac	Bias poor	Bias acceptable
	Enumerat	10	88.1	7.6	2.6	0.68	0.8	99.2	0.41	0.32	TEM poor	R value go	Bias acce	Bias good
	Enumerat	10	88.7	7.4	6.8	1.99	2.2	92.7	1.09	0.85	TEM reject	R value po	Bias poor	Bias poor
	Enumerat	10	88.5	7.4	1	0.26	0.3	99.9	0.77	0.55	TEM good	R value go	Bias acce	Bias acceptable
	Enumerat	10	88.3	7.7	1.3	0.4	0.4	99.7	0.52	0.39	TEM good	R value go	Bias acce	Bias good
	Enumerat	10	88	7.3	3	0.86	1	98.6	0.66	0.57	TEM poor	R value ac	Bias acce	Bias acceptable
	Enumerat	10	88	7.1	1.7	0.72	0.8	99	0.64	0.41	TEM poor	R value ac	Bias acce	Bias acceptable
	Enumerat	10	86.9	7.2	1.7	0.81	0.9	98.7	1.31	1.26	TEM poor	R value ac	Bias poor	Bias poor
	enum inte	9x10	88.4	7.4	-	1.55	1.8	95.6	-	-	TEM reject	R value acceptable		
	enum inte	9x10	87.9	7.3	-	0.81	0.9	98.8	-	-	TEM acce	R value acceptable		
	inter enun	10x10	88.1	7.3	-	1.14	1.3	97.4	-	-	TEM poor	R value acceptable		
	TOTAL intr	9x10	-	-	-	1.7	1.9	94.6	-	-	TEM reject	R value poor		
	TOTAL+ su	10x10	-	-	-	1.63	1.8	95.1	-	-	TEM reject	R value acceptable		
MUAC		subjects	mean	SD	max	Technical	TEM/mear	Coef of rel	Bias from	Bias from	median		From	From
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm	Bias (mm)			Superviso	Median
	Superviso	10	138.7	6.1	5	1.3	0.9	95.4	0	1.2	TEM good	R value ac	Bias good	Bias acceptable
	Enumerat	10	139.1	6	5	1.67	1.2	92.3	1.2	1.12	TEM good	R value po	Bias acce	Bias acceptable
	Enumerat	10	138.9	6.2	10	2.73	2	80.9	1.37	1.06	TEM poor	R value re	Bias acce	Bias acceptable
	Enumerat	10	141.7	6.3	7	2	1.4	90.1	3.14	2.41	TEM good	R value po	Bias rejec	Bias poor
	Enumerat	10	144.2	6.6	7	2.35	1.6	87.3	5.81	4.74	TEM acce	R value re	Bias rejec	Bias reject
	Enumerat	10	140.1	5.8	3	1.12	0.8	96.3	3.23	2.02	TEM good	R value ac	Bias rejec	Bias poor
	Enumerat	10	141.4	5.8	2	0.67	0.5	98.6	3.47	2.25	TEM good	R value ac	Bias rejec	Bias poor
	Enumerat	10	139.6	6.1	4	1.28	0.9	95.6	2.4	1.08	TEM good	R value ac	Bias poor	Bias acceptable
	Enumerat	10	140.3	7.7	6	2.2	1.6	91.9	3.79	2.86	TEM acce	R value po	Bias rejec	Bias poor
	Enumerat	10	139.4	6.3	4	1.72	1.2	92.5	1.63	1.84	TEM good	R value po	Bias acce	Bias acceptable
	enum inte	9x10	140.6	6.3	-	3.08	2.2	76.4	-	-	TEM poor	R value reject		
	enum inte	9x10	140.4	6.5	-	2.58	1.8	84.3	-	-	TEM acce	R value reject		
	inter enun	10x10	140.3	6.4	-	2.82	2	80.6	-	-	TEM poor	R value reject		
	TOTAL intr	9x10	-	-	-	3.39	2.4	71.9	-	-	TEM reject	R value reject		
	TOTAL+ su	10x10	-	-	-	3.35	2.4	72.4	-	-	TEM reject	R value reject		

Suggested cut-off points for acceptability of measurements				
Parameter		MUAC mm	Weight Kg	Height cm
individual	good	<2.0	<0.04	<0.4
TEM	acceptabl	<2.7	<0.10	<0.6
(intra)	poor	<3.3	<0.21	<1.0
	reject	>3.3	>0.21	>1.0
Team TEM	good	<2.0	<0.10	<0.5
(intra+inte	acceptabl	<2.7	<0.21	<1.0
and Total	poor	<3.3	<0.24	<1.5
	reject	>3.3	>0.24	>1.5
R value	good	>99	>99	>99
	acceptabl	>95	>95	>95
	poor	>90	>90	>90
	reject	<90	<90	<90
Bias	good	<1	<0.04	<0.4
	acceptabl	<2	<0.10	<0.8
	poor	<3	<0.21	<1.4
	reject	>3	>0.21	>1.4

Appendix 4 – Local Event Calendar

Month of Year	2020		2021		2022		2023		2024		2025	
Jan			New year/9th CPA Day	**50**	New year/9th CPA Day	**38**	New year/9th CPA Day/ Death of Paramount Chief Dhieu Duang	**26**	New year/9th CPA Day	**14**	New year/CPA day/Nation wide tension with Sudan	**2**
Feb			Opening of school/Back to school campaign for Post Covid	**49**	Opening of school/Road Construction	**37**	Pope Visit to South Sudan/Opening of school	**25**	Opening of school	**13**	Cholera Vaccination Campaign/Opening of school	**1**
Mar			International Women Day/Ramadan	**48**	International Women Day/Ramadan	**36**	International Women Day/Ramadan	**24**	Polio Vaccina/International Women Day/Ramadan	**12**		
April	Easter Holidays/Farm Clearance	**59**	Easter Holidays/Farm Clearance	**47**	Easter Holidays/Farm Clearance	**35**	Easter Holidays/Farm Clearance	**23**	Easter Holidays/Farm Clearance	**11**		
May	16th SPLA Day/Planting of sorghum/Starting of rainy season	**58**	16th SPLA Day/Planting of sorghum/Starting of rainy season	**46**	16th SPLA Day/Planting of sorghum/Starting of rainy season	**34**	16th SPLA Day/Planting of sorghum/Starting of rainy season	**22**	16th SPLA Day/Planting of sorghum/Starting of rainy season	**10**		
June	Weeding/Planting of G'nuts/Eid aldha	**57**	Weeding/Planting of G'nuts/Eid aldha	**45**	Weeding/Planting of G'nuts/Eid aldha	**33**	Weeding/Planting of G'nuts/Eid aldha	**21**	Weeding/Planting of G'nuts/Eid aldha	**9**		
July	/South Sudan Independence day/Martyres Day	**56**	/South Sudan Independence day/Martyres Day	**44**	/South Sudan Independence day/Martyres Day	**32**	/South Sudan Independence day/Martyres Day	**20**	/South Sudan Independence day/Martyres Day	**8**		
Aug	Eid Maria	**55**	Eid Maria	**43**	Eid Maria	**31**	Eid Maria	**19**	Start of Flooding/Eid Maria	**7**		
Sept	Start of harvesting	**54**	Start of harvesting/Covid-19 Vaccine	**42**	Start of harvesting	**30**	Start of harvesting	**18**	Start of harvesting	**6**		
Oct	Comboni day/Post Harvest	**53**	Comboni day/Post Harvest	**41**	Comboni day/Post Harvest	**29**	Comboni day/Post Harvest/Measels	**17**	Comboni day/Post Harvest	**5**		
Nov	Start of dry season	**52**	Start of dry season	**40**	Start of dry season	**28**	Start of dry season	**16**	Start of dry season/Deworming camp	**4**		
Dec	Christmas Celebration	**51**	Christmas Celebration/Tuany Reec	**39**	Christmas Celebration	**27**	Christmas Celebration	**15**	Visits of the newly appointed Commissioner/Christmas	**3**		