



**EVALUATION OF THE NUTRITION SURVEILLANCE  
ACTIVITIES OF ACF-USA**

**&**

**ANALYSIS OF THE NUTRITION SITUATION IN SOUTH SUDAN  
IN 2007**

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## I. ACKNOWLEDGEMENTS

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## II. LIST OF ACRONYMS

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ANLA	Annual Needs' and Livelihood Assessment
ACF-South Sudan	Member of ACF International Network-ACFIN
BEG	Bahr El Ghazal
CCRI	Cush Community Relief International
CMA	Christian Mission Aid
CPA	Comprehensive Peace Agreement
CRED	Centre for Research on the Epidemiology of Disasters
CTC	Community Therapeutic Care
DFID	The UK Department for International Development
EBF	Exclusive Breast Feeding
ECHO	European Commission Humanitarian Aid Office
ENA	Emergency Nutrition Assessment
EPI	Expanded Programme of Immunisation
ERT	Emergency Response Team
FEWSNET	Famine Early Warning System Network
GAM	Global Acute Malnutrition
IDP	Internally Displaced Person
INGO	International Non-Governmental Organisation
IRIN	Integrated Regional Information Networks
JAM	Joint Assessment Mission
MOH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
NBEG	Northern Bahr El Ghazal
OFDA	Office of Foreign Disaster Assistance
NNGO	National Non-Governmental Organisation
RTI	Respiratory Tract Infection
SAM	Severe Acute Malnutrition
SCC	Sudan Council of Churches
SCN	Standing Committee on Nutrition
SMART	Standardized Monitoring and Assessment in Relief and Transitions
SPSS	Statistical Package for Social Sciences
SS	Sentinel Surveillance
SSCCSE	South Sudan Centre for Census, Statistics and Evaluation
SSRRC	South Sudan Relief and Rehabilitation Commission
SRC	Sudan Red Crescent
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission for refugees
UNICEF	United Nations International Children's Emergency Fund
UNOCHA	United Nations Office of the Coordination for Humanitarian Affairs
USAID	United States Agency for International Development
WFH	Weight for Height
WFP	World Food Programme
WHO	World Health Organization

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## V. INTRODUCTION

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ACF-South Sudan fights malnutrition through surveillance; treatment; water, sanitation and hygiene promotion, health education, food security and livelihoods and advocacy. The nutrition surveillance program in South Sudan focuses on the following areas:

- Nutrition surveys: Estimate the rate of global and severe acute malnutrition among a population at a given time;
- Sentinel site surveillance: A regular collection and analysis of nutrition data in order to give warning of impending crisis or to make programmatic decisions that will prevent the deterioration of the nutrition situation of the population;
- Rapid nutrition assessments: provide a quick estimate of the nutritional situation of a population;
- Training and capacity building: Aims at promoting standardized methodologies and increasing the technical capacity of other agencies and MoH to implement nutritional surveys, sentinel sites surveillance and malnutrition treatment;
- Advocacy: A means to influence stakeholders to take up nutrition survey recommendations in order to address factors associated with malnutrition.

The main aims of this report are to review and evaluate the impact of the nutritional surveillance activities in ACF-South Sudan, and to analyse the nutrition situation in South Sudan in 2007. The areas of focus are:

Section I: Humanitarian response to nutrition emergencies in South Sudan in 2007;

Section II: Capacity development for more national and international organizations to implement nutrition surveys;

Section III: Analysis of nutrition situation in southern Sudan in 2007.

## **I. HUMANITARIAN RESPONSE TO NUTRITION EMERGENCIES IN 2007**

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### **1. Context**

Sudan is a diverse developing country in northeastern Africa. It is the largest country in Africa measuring approximately 2.5 million km<sup>2</sup>. The waters of the White Nile and its tributaries flow down from the highlands of Ethiopia, Uganda and the Central African Republic into the low clay basin that constitutes much of southern Sudan, forming the world's largest contiguous swamps. Despite the rich off-take possible from the Nile ecosystem, there are several disadvantages as well, including the widespread prevalence of diseases such as malaria, diarrhoea and respiratory tract infections. In the southwestern agricultural belt, the humid environment is conducive to tsetse fly habitation, which causes trypanosomiasis (sleeping sickness), while the expansive acacia and savannah grasslands of the Eastern Flood Plains are home to infestations of the sand fly, which causes leishmaniasis<sup>1</sup>.

Sudan's population is one of the most varied on the African continent. There are two distinct major cultures, Arab and black African with hundreds of ethnic and tribal subdivisions and language groups, which make effective collaboration among them a major political challenge. Sudan's longest civil war began in 1983, largely pitting the Muslim north against the Christian south, and killing at least 2 million people and displacing a further 4 million. Twenty years of intense and often widespread conflict between North and South Sudan created a humanitarian crisis and disrupted livelihood systems.<sup>2</sup> The signing of the comprehensive peace agreement in January 2005 ended the civil war and saw the formation of a provisional Government in South Sudan that provides for power sharing pending national elections. The relative peace and Sudan's vast natural resource endowments and significant human capital now offer enormous development potential.<sup>3</sup>

### **2. Indicators of Acute Malnutrition in South Sudan**

Malnutrition is a condition resulting from nutritional inadequacy in which an individual's physiological and physical functions are impaired. The condition may stem from a series of causes ranging from structural factors to more immediate ones such as inadequate food intake and disease. Chronic malnutrition results from exposure to these factors over a long period of time and manifests through growth failure or stunting in an individual (i.e., low weight or height in respect to age). Acute malnutrition is the focus of this report; this type of malnutrition occurs over a short period and is indicated by wasting or thinness (i.e. low weight in respect to height). As the condition develops, metabolic and immunological consequences become more marked, and treatment becomes more difficult, costly and likely to fail. Timely intervention is hence important in reducing severe forms and associated risks of mortality.

The following guidelines are used in expressing acute malnutrition in Z-score and percentage of the median.

Guidelines for the results expressed in Z-scores:

- Severe malnutrition is defined by WFH<sup>4</sup> < -3 SD<sup>5</sup> and/or existing bilateral oedema.
- Moderate malnutrition is defined by WFH < -2 SD and ≥ -3 SD and no oedema.
- Global acute malnutrition is defined by WFH < -2 SD and/or existing bilateral oedema.

Guidelines for the results expressed in percentage of median:

- Severe malnutrition is defined by WFH < 70% and/or existing bilateral oedema.
- Moderate malnutrition is defined by WFH < 80% and ≥ 70 % and no oedema.
- Global acute malnutrition is defined by WFH <80% and/or existing bilateral oedema

Nutritional surveys estimate the rate of global and severe acute malnutrition among the 6-59 months age group. This target population group is considered the most sensitive to shocks affecting a population and gives an indication of the severity of the situation in the whole population. The methodology used and the sample of children to be measured are determined according to the total population size and distribution.

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<sup>1</sup> Southern Sudan Centre for Census, Statistics and Evaluation (2005): South Sudan Livelihood profile

<sup>2</sup> USAID Situation Report 2007

<sup>3</sup> JAM Sudan 2005

<sup>4</sup> Weight for Height

<sup>5</sup> Standard Deviation

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The selection of the subjects is designed to eliminate bias and get a representative sample. The most used methodology in South Sudan is the 2 stages cluster sampling. In addition to the anthropometric measurements (age, sex, weight, height, oedema, MUAC<sup>6</sup>), nutrition surveys gather information on health, food security, water & sanitation and hygiene. A retrospective mortality survey is usually concurrently done along the nutrition survey, i.e. estimating the number of deaths between the total and the under-five population from the preceding 3 months and identifying the presumed cause.

**A global acute malnutrition rate above 15% and/or a rate of severe acute malnutrition above 4%<sup>7</sup> are considered as the emergency and critical threshold.**

### **3. Nutrition Survey, sentinel sites surveillance, rapid assessment and Advocacy Activities of ACF-USA in 2007**

There were 16 nutrition surveys implemented by different agencies in South Sudan in 2007, 9 of which were implemented by ACF-South Sudan. There was a reduction in the number of surveys implemented by ACF- South Sudan, and other partners, compared to previous years, which is due to the introduction of new surveillance methods such as sentinel sites surveillance.

Fieldwork lasts an estimated 3-4 weeks in the field for the collection anthropometric, mortality and qualitative data. Processing, analysis and executive summary report writing (with ENA software, SPSS and Excel spreadsheet last 4-6 days. Completion, validation (at mission and headquarters level), and release of preliminary finding reports take a maximum of 5 days after the latter. The final report takes a maximum of 2 weeks after the release of the executive summary report.

A community based pilot nutrition sentinel site surveillance system started in 2007 in collaboration with MOH and other partners. Its main purpose is to detect changes in trends or distribution of acute malnutrition in order to initiate investigative or control measures Three sites were opened; in the southern zone of Malakal (Upper Nile state) in September, Khorfulus County (Jonglei State) in October and Alek South Payam (Warrap State) in December 2007. In each state, the sentinel site is selected purposefully taking into account MOH cooperation, livelihood zones, accessibility, security, vulnerability to food insecurity and health crisis. Anthropometric data are collected on monthly basis in 6 randomly selected clusters. In each cluster a minimum of 20 children aged between 6-59 months are assessed. In addition, 30 households per sentinel site are randomly selected and interviewed, for the collection of qualitative data. Figure 1 and 2 illustrate the results obtained.

Two nutrition rapid assessments were achieved in Phom Zeraf and Kaldak/Khorfulus Counties in Jonglei State. Due to conflict and insecurity, the Phom Zeraf assessment purposed to: gather information on population movement e.g. the number of returnees, IDPs and their needs; assess the humanitarian situation, needs, gaps and status of on going assistance; and ascertain whether there were any agencies operating in the location. The Kaldak assessment aims were to; verify the unconfirmed reports of measles outbreak and to have an overview of the flood, diseases, basic services and general situation in the area.

### **4. Response to Survey Recommendations and Advocacy initiatives.**

Based on the survey results, ACF-South Sudan critically analyses the causes of malnutrition in each of the specific regions where the surveys have been done and then proposes the necessary recommendations. The causes of malnutrition are based on the UNICEF conceptual framework of malnutrition. In most cases, the causes are related to food insecurity, disease, unhygienic behavior and poor sanitary conditions, inadequate childcare practices and lack of potable water. Recommendations are developed after critically analyzing nutrition situation and putting into consideration WHO 2000, UNHCR Geneva 2000 emergency standards, indicators and SMART recommendation guidance notes. ACF-South Sudan seeks multi sectoral approach in addressing the root causes of malnutrition.

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<sup>6</sup> MUAC: Mid-Upper Arm Circumference; this is a relevant indicator of the risk of mortality among children aged 1 to 5 years: MUAC is more significant for children aged 1 year and plus ( $\geq 75$  cm in height) since MUAC does not change a lot from 6 months up to 1 year.

<sup>7</sup> World Health Organization, 1995. *Classification of wasting prevalence in under five's*.

The surveys results and recommendations are shared with various partners who include but not limited to the following;

- South Sudan Ministry of Health;
- All Agencies operating where the surveys have been done;
- All Nutrition Agencies operating in South Sudan;
  - UN Agencies (UNICEF, WHO, FAO, UNOCHA and WFP);
  - Surveillance bodies (FEWSNET, United Nation System Standing Committee on Nutrition (SCN);
  - South Sudan Relief and Rehabilitation Commission (SSRRC);
  - Center for Research on the Epidemiology of Disasters (CRED).

The advocacy on the recommendations is continued for 2 months following the release of each nutrition survey report. The following table shows the locations where surveys were done, number of recommendations made and respective responses in 2007.

**Table 1: Recommendations and response per location, ACF-South Sudan nutrition surveys in South Sudan in 2007**

Survey location	Number of Recommendations	Number taken up	Number not taken up
Gogrial West County	10	10	0
Melut County	10	7	3
Malakal County	11	9	2
Khorfulus and Atar	11	11	0
South Bor (Padak)	7	*	*
Nyirol County	7	*	*
Renk County	10	*	*
Tonj North County	*	*	*
<b>TOTAL</b>			

\* Advocacy follow-up on going. The advocacy follow up has taken a little more time due to delayed response from target decision makers occasioned by relocation of most agencies to South Sudan in 2007.

It has to be noticed that Renk surveys led to one advocacy report although two surveys were conducted in this area.

At the time of reporting, 88% of the recommendations have been implemented for 2007, on the 4 first surveys.

The response rates in 2005 and 2006 were 73% and 72% respectively.

## **II. CAPACITY BUILDING TO IMPLEMENT NUTRITION SURVEYS AND TREATMENT PROGRAMS**

Capacity building involves processes that enhance the skills of individuals, groups and communities. Due to the changing humanitarian contexts in South Sudan, it is becoming increasingly necessary to empower both Government staffs and National NGOs with the skills required to address most of the public health concerns with limited support from international agencies.

Since 2005, ACF-USA has been focusing more on incorporating National NGOs and MOH in nutrition capacity building (survey preparation, surveyor training, data collection and treatment). In 2007, this initiative saw the involvement of the Ministry of Health personnel in most of the surveillance activities.

It is also remarkable that in 2007 the number of NNGOs capacity built on detection of malnutrition through active involvement in surveys increased to four compared to one in 2006. Some of the NNGOs who actively participated in nutrition surveys included Sudan Red Crescent (SRC), Sudan Council of Churches (SCC), Sudan Medical Care (SMC) and Cush Community Relief International (CCRI) as shown in the table below.

**Table 2: NNGO involvement in nutrition surveys in 2007**

NNGO	No. of surveys	No. of staff involved	Location
SRC	4	3	Malakal, Khorfulus, Nyirol and Renk
SCC	1	1	Malakal
SMC	1	1	South Bor
CCRI	1	1	Nyirol

A number of training sessions, both organized by ACF and other stakeholders were conducted in the year 2007. The ACF surveillance team had the pleasure to facilitate the nutrition component in three Emergency Response Trainings (ERT), organized by UNOCHA and with a major focus on the application of SPHERE minimum standards during emergencies. The participants were drawn from various sectors including government ministries and International NGOs.

Other trainings focused on capacity building the MOH staff on the effective detection and management of severe acute malnutrition. These were conducted in collaboration with the ACF- Nutrition Treatment Program in Malakal and Renk counties of Upper Nile state. Similarly, with the introduction of Nutrition sentinel site surveillance in South Sudan in late 2007, three trainings were conducted in Upper Nile, Jonglei and Warrap States

**Table 3: Summary of trainings, 2007**

Location	Trainees	Nature of training	NO. Of trainings	NO. of participants
Malakal	MoH	Treatment of acute malnutrition	2	45
Renk	MoH	Treatment of acute malnutrition	1	15
Rumbek	MoH, NGO	Emergency Response Training	2	50
Wau	MoH, NGO	Emergency Response Training	1	26
Malakal	Community workers /MoH	Sentinel site surveillance	1	7
Warrap	Community workers /MoH	Sentinel site surveillance	1	9
Jonglei	Community workers /MoH	Sentinel site surveillance	1	8

### III. ANALYSIS OF NUTRITION SITUATION IN SOUTH SUDAN IN 2007

#### 1. Framework for Analysis

##### 1.1 Survey Methodology

The two survey methodologies employed in the nutrition surveys included in this analysis are:

- **Exhaustive survey** where all children aged 6 to 59 months of the target location are measured. It therefore gives the exact prevalence of malnutrition in that population.
- **Sampling surveys** where only a representative sample of children aged 6 to 59 months of the target area are measured. The results provide an estimated prevalence of malnutrition among that population. There are three types of sample surveys namely simple, systematic and cluster. The clusters can be 30 by 30 or in the case of SMART methodology, the clusters can be with fewer children.

## 1.2 Estimated Average of Malnutrition rates in Southern Sudan

The estimated average rates of acute malnutrition in southern Sudan are further broken down by region - Upper Nile and Bahr El Ghazal. It should be borne in mind that these are not a statistical representation of the nutritional situation throughout the South, but rather gives an indication of the general situation.

Global acute malnutrition average is **19.4% (18.4% – 21.3%)** while severe acute malnutrition stays at **2.1% (1.7% – 2.6%)**<sup>8</sup>. These rates are taken from the 9 surveys conducted by ACF-USA in 2007 (n=6447, z-score using NCHS reference table from 1977). 12 of the 16 locations had GAM above the 15% emergency benchmark (cf. table 4 below). Important differences exist in the rates of acute malnutrition from one area to the other one. As a comparison, the average rates measured in 2006 were **19.5% (18.3% - 20.8%)** and **2.3% (1.9% - 2.6%)** for Global acute malnutrition and severe acute malnutrition respectively (n=7850, z-score using NCHS reference table from 1977). Considering the rates and the confidence intervals, it appears that the situation did not change at all in terms of rates of acute malnutrition since 2006.

Here follows a summary of the average rates of acute malnutrition in South Sudan for the last years, taking into consideration all the surveys conducted in the country. Results appear not to have evolved significantly since 2003.

**Table 4: Summary<sup>9</sup> of average rates of acute malnutrition in South Sudan, 2003 - 2007**

Year	2003	2004	2005	2006	2007
<b>GAM</b>	20.8 %	19%	18.7 %	19.5 %	19.4 %
<b>SAM</b>	3.6 %	2.7%	2.4 %	2.3 %	2.1 %

## 1.3 Geographical Coverage

The report also gives an estimated representation of the geographical coverage of the nutrition surveillance activities in 2007. For practical reasons, the reference unit used is the county.

Again, the maps do not give a statistical representation of the coverage but rather an indication of the number of counties covered and the estimated average of the rates of malnutrition detected.

## 1.4 Seasonal Variations

Even though the results of the nutrition surveys could suggest seasonal variations between hunger gap and post harvest periods, detailed analysis is constrained by number of surveys implemented per month and location. Generally, in the hunger gap period (March - August) malnutrition rates tend to rise in most locations, which can be attributed to the dwindling food stocks, water scarcity and compromised care practices.

## 2. Nutritional Surveillance Coverage and Malnutrition Situation in Southern Sudan in 2007

The selection of the locations to be surveyed by the different agencies puts into consideration some or all of the following factors:

- ☞ Recommendations formulated after rapid assessments that call for further assessment of the nutrition situation;
- ☞ Regular monitoring and evaluation of the nutrition situation of specific program locations;
- ☞ Lack of baseline information on nutrition with a particular concern in the area;
- ☞ Humanitarian crisis such as floods, drought and displacement that have nutrition implications.

Sixteen nutrition surveys were implemented in 16 counties and five states in South Sudan in 2007. These were distributed as follows: 3 in Warrap, 5 in Jonglei, 4 in Upper Nile, 3 in Unity and 1 in Northern Barh el

<sup>8</sup> Malnutrition Rates are expressed in Z-scores, NCHS reference, with a 95% confidence interval.

<sup>9</sup> Cf. Annual surveillance reports from ACF-USA

Ghazal. The number of surveys reduced compared to the previous years. This could be linked with the introduction of other surveillance methodologies, funding and varying organizations program strategic priorities. The table below shows locations in which surveys were implemented in 2007.

The average GAM and SAM rates were 19.4% (18.4% – 21.3%) and 2.1% (1.7% – 2.6%) respectively. Although high malnutrition is known to cause mortality, there is not enough evidence to link directly the mortality and GAM rates. Acute malnutrition and under-five mortality do not necessarily increase in tandem, unless food insecurity, health or care factors are contributing simultaneously. In some studies, it has been argued that in non-refugee or non-IDP contexts, malnutrition cannot be used to predict mortality. In South Sudan's current conditions of high malnutrition and low mortality, other factors such as morbidity, may have a more direct relationship with mortality.

Following are the results of the 16 surveys conducted in South Sudan, followed by the results of the two sentinel sites implemented since September 2007.

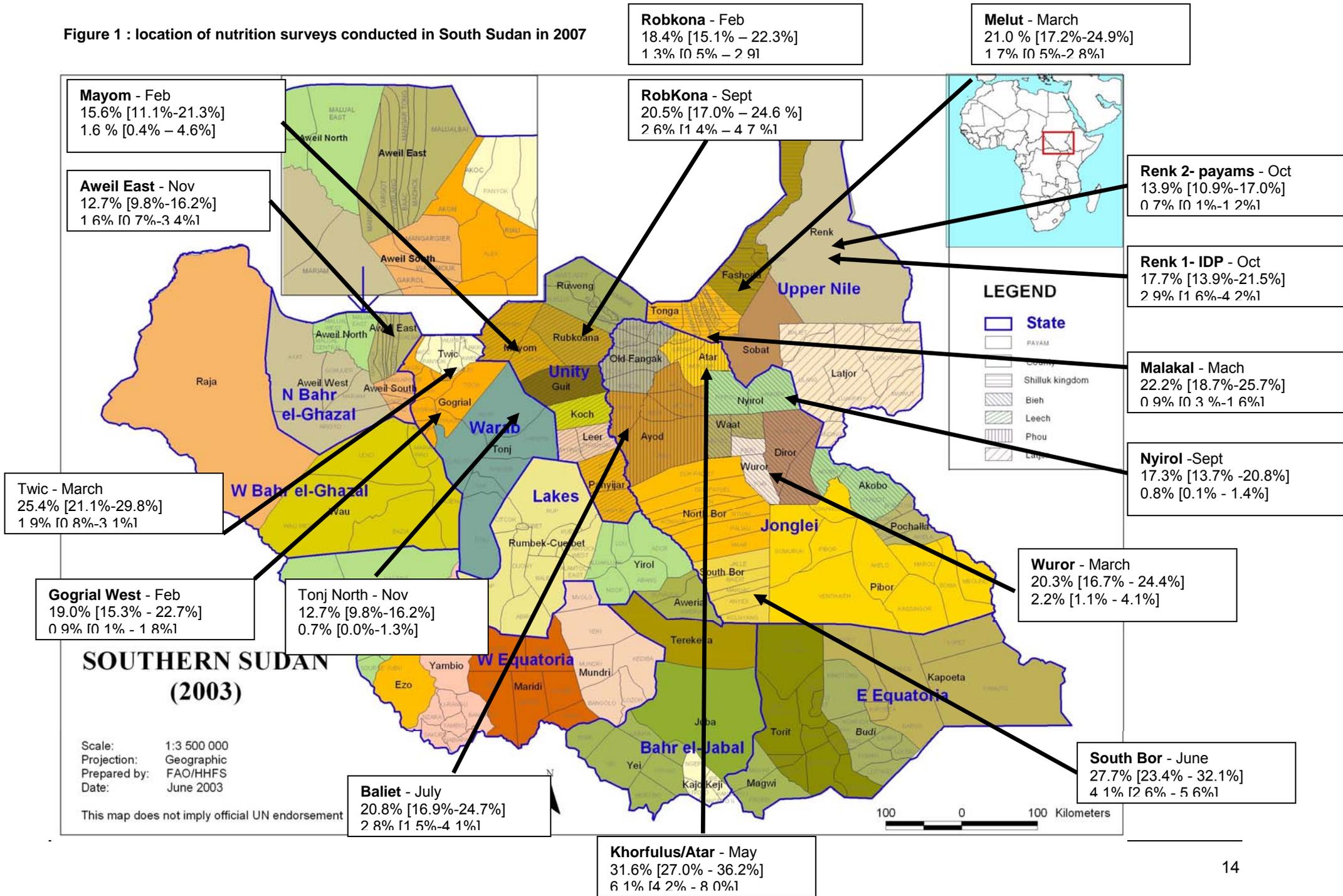
**Table 5: Nutrition surveys in South Sudan, 2007**

	COUNTY	STATE	AGENCY	MONTH	GAM IN Z-SCORES <sup>10</sup>	SAM IN Z-SCORES	CMR 0-5 DEATH RATE <sup>11</sup>
1	Gogrial West	Warrab	ACF-USA	Feb	19.0% [15.3% - 22.7%]	0.9% [0.1% - 1.8%]	0.58 0.97
2	Robkona	Unity	ACF-F	Feb	18.4% [15.1% - 22.3%]	1.3% [0.5% - 2.9]	0.35 0.98
3	Mayom	Unity	ACF-F	Feb	15.6% [11.1%-21.3%]	1.6 % [0.4% - 4.6%]	0.15 0.54
4	Wuror	Jonglei	Tearfund	March	20.3% [16.7% - 24.4%]	2.2% [1.1% - 4.1%]	1.38 1.35
5	Melut	Upper Nile	ACF-USA	March	21.0 % [17.2%-24.9%]	1.7% [0.5%-2.8%]	0.83 0.69
6	Malakal	Upper Nile	ACF-USA, MOH and SRC	March	22.2% [18.7%-25.7%]	0.9% [0.3 %-1.6%]	0.50 0.55]
7	Twic	Warrab	GOAL	March	25.4% [21.1%-29.8%]	1.9% [0.8%-3.1%]	1.71 2.45
8	Khorflus- Atar	Jonglei	ACF-USA, MOH and SRC	May	31.6% [27.0% - 36.2%]	6.1% [4.2% - 8.0]%	0.67 1.74
9	South Bor-	Jonglei	ACF-USA, CMA and SMC	June	27.7% [23.4% - 32.1%]	4.1% [2.6% - 5.6%]	0.45 0.51
10	Baliet	Jonglei	GOAL	July	20.8% [16.9%-24.7%]	2.8% [1.5%-4.1%]	1.75 3.48
11	Nyirrol	Jonglei	ACF-USA, MOH, SRC and CCRI	Sep	17.3% [13.7% -20.8%]	0.8% [0.1% - 1.4%]	1.24 0.12
12	RobKona	Unity	ACF-F	Sep	20.5 % [17.0% - 24.6 %]	2.6 % [1.4% - 4.7 %]	0.59 1.02
13	Renk 1- IDP	Upper Nile	ACF-USA, SRC and MOH	Oct	17.7% [13.9%-21.5%]	2.9% [1.6%-4.2%]	1.0 2.29
14	Renk 2- payams	Upper Nile	ACF-USA, SRC and MOH	Oct	13.9% [10.9%-17.0%]	0.7% [0.1%-1.2%]	0.19 0.53
15	Tonj North	Warrap	ACF-USA and WVI	Nov	6.2% [4.3%-8.1%]	0.7% [0.0%-1.3%]	0.17 0.23
16	Aweil East	Northern Bahr el Ghazal	Tearfund	Nov	12.7% [9.8%-16.2%]	1.6% [0.7%-3.4%]	0.41 0.96

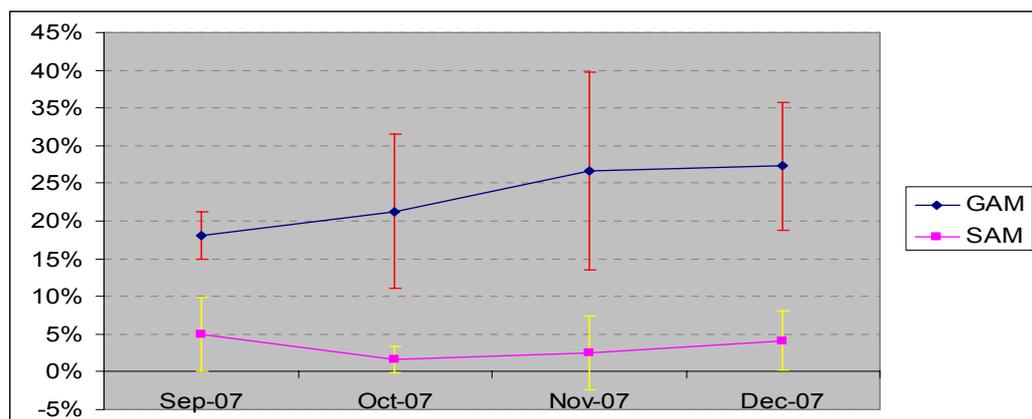
<sup>10</sup> NCHS reference, with 95% confidence interval.

<sup>11</sup> Rates expressed in deaths / 10.000 children / day

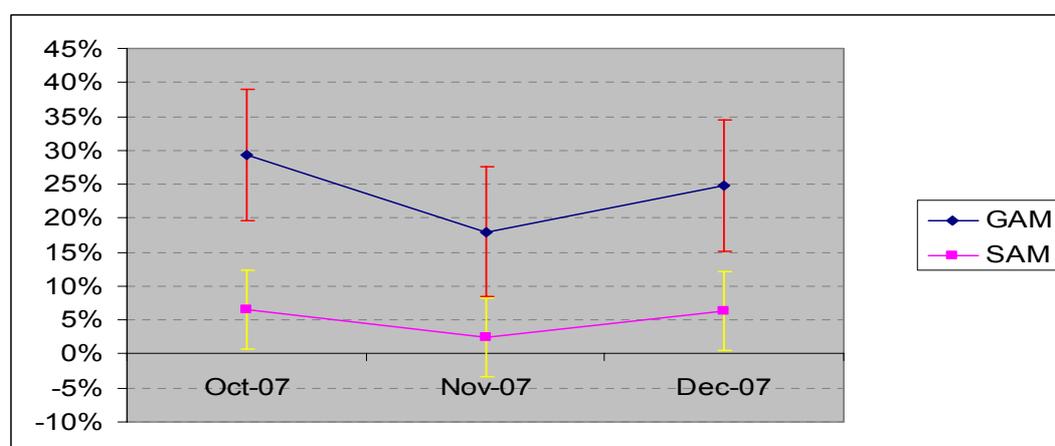
**Figure 1 : location of nutrition surveys conducted in South Sudan in 2007**



**Figure 2: Results of Sentinel site surveillance, Malakal Southern zone, Sept-Dec 2007**



**Figure 3: Results of sentinel site surveillance, Khorfulus, Oct-Dec 2007**



The high fluctuations in the acute malnutrition rates identified through the sentinel sites have led the teams to question the methodology used for collection of anthropometric data. The methodology will be discussed and reviewed with all partners in the beginning of 2008 to ensure better representation of the targeted populations.

### 3. Nutrition situation and malnutrition trends in Upper Nile

The region is geographically located in southwest Sudan and borders the states of South Kordofan and West Kordofan in the north, Unity and Lakes in the east and West Equatoria in the south. Administratively, the region is divided into three states namely Upper Nile, Jonglei and Unity which are further sub-divided into counties. Upper Nile state comprise of 13 counties; Renk, Melut, Manyo, Fashoda, Malakal, Panyikang, Maban, Maiwut, Baliyet, Nasir, Longuchok and Akoka while Jonglei is made up of 12 counties namely Fangak, Atar, Ayod, Nyirol, Waat, Wuror, Diror, North Bor, South Bor, Pibor, Akobo and Pochalla. Unity (Liech) comprises of Mayom, Abiemnhom, Rubkona, Guit, Koch, Leer, Mayendit, Payinjar and Parieng counties.

The region is characterized by fertile low land and is rich in oil deposits. The Nile and numerous rivers pass through the region and provide important sources of food and income as well as transport routes to many parts of southern Sudan. With so many rivers, seasonal flooding is widespread as noted in July 2007. The region mainly falls within the Nile Sobat, Eastern and arid/pastoral livelihood zones. In the Nile Sobat zone, in addition to crops and livestock, wild foods and fish are significant sources of food. Similar livelihood sources are found in the Eastern flood plain though supplemented with game hunting. In the arid zone households practice a nearly pure form of pastoralism and there is almost exclusive reliance on livestock and livestock trade for food. Seasonal migrations in search for both water and pasture provide opportunities for substantial trade and exchange with neighboring communities.

Despite the potential in the region; oil revenues, livestock, fish, water and fertile land, the region has some of the highest malnutrition rates in South Sudan. Fewsnets November 2007 report also noted that,

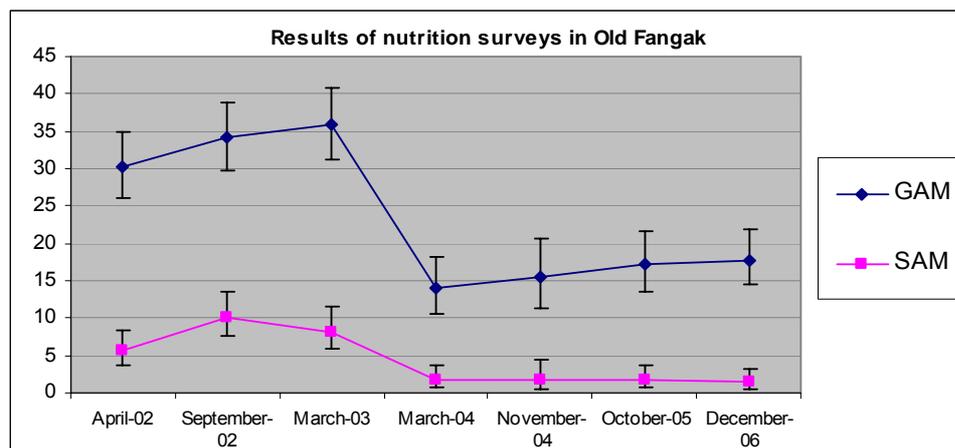
localized food shortages could persist in parts of the Eastern and Western Flood Plains and Nile Sobat livelihood zones, due to flooding between July and September 2007. The flooding in Eastern and Western Flood Plains is estimated to have affected between 50,000 and 200,000 people, where crops were lost. However, post flood activities such as flood recessional agriculture and fishing would benefit affected households in late 2007 and early 2008. Other concerns include insecurity related to ethnic tensions and cattle raiding in Twic, Nyirol, Pibor and Bor counties, and the return of IDPs from northern Sudan.

IRIN, on November 23<sup>rd</sup> 2007, reported that close to 30,000 Southern Sudanese who fled the country's 21-year long north-south war were to return home from camps in neighboring Ethiopia during 2008 as part of an agreement between the governments of the two countries and the UN Refugee Agency, signed on 22 November in Khartoum. Most of these returnees are likely to settle in Upper Nile, Unity and Jonglei. Based on the above, Upper Nile and Jonglei states will remain vulnerable in 2008. Food security and health will remain a challenge in counties like Renk, Manyo, Maiwut, Panyikang, Khorflus Nassir, Bor, Pibor and Akobo that experienced flooding, insecurity and received a high number of returnees.

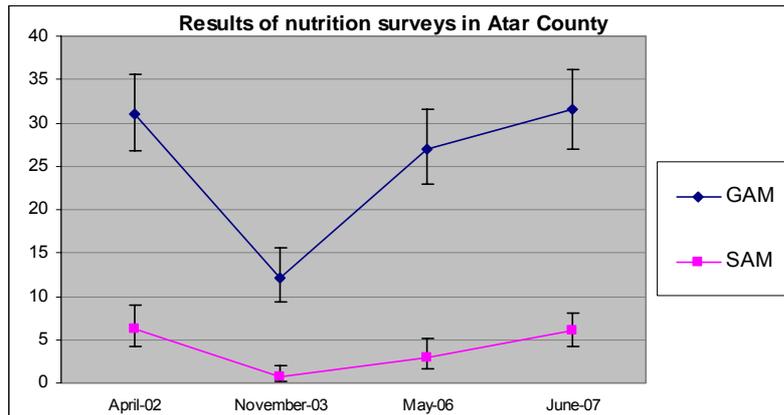
In the 2007 project period, 12 nutrition surveys were conducted in the region. The counties covered were Melut, Malakal, Renk, Wuror, Khorfulus, South Bor, Baliel, Nyirol, Rubkona, and Mayom. The results of the aforementioned surveys are tabulated in table 4. The surveys carried out during the hunger period revealed higher and above emergency malnutrition rates compared to post harvest surveys. Renk survey was implemented in October with one of the objectives being to find out the effects of floods on nutrition. The IDPs were more predisposed to malnutrition than other residents of Renk, highlighting the rapid risk of deterioration of the situation in the communities when facing a shock.

Figures 4 and 5 below highlight the evolution of the rates of acute malnutrition in two vulnerable areas of Upper Nile Region. This compilation of available data from different organizations highlight the need for more consistency in the periods of conduction of the nutrition surveys, in order to be able to compare the data collected. Indeed, though such results might demonstrate that seasonal variations of the rates of acute malnutrition are high (rates reaching a peak between May and September), they do not offer the possibility to analyse if the situation really improved or worsened. However, it has to be noticed that whether conducted during the post harvest period (October to January) or during the hunger gap period, rates of global acute malnutrition are consistently above the emergency threshold of 15%.

**Figure 4: results of nutrition surveys in Old Fangak since 2002**



**Figure 5: results of nutrition surveys in Atar since 2002**



These discrepancies in the periods of conduction of surveys could be corrected by the implementation of a proper coordination system between all humanitarian actors. This situation could also be prevented by the extension of a comprehensive sentinel site surveillance system that would provide trends of acute malnutrition throughout the year in targeted vulnerable areas. Such a system was established in Upper Nile and Jonglei states with an aim of monitoring malnutrition trends and providing early warning signals. Being a pilot program, only one site per state was established so far, in Malakal and Khorfulus counties. Four rounds of data collection were conducted in the site in Malakal while three were conducted in Khorfulus... Results are shown in figures 2 and 3.

Generally, the nutrition situation in the region might be explained by the following factors:

### **Disease prevalence**

Diarrhoea, malaria and RTI were cited as the most common causes of morbidity in most of the surveyed areas. The same trend has also been established by the sentinel site data from Malakal and Khorfulus. Effects of diarrhoea, RTI and malaria such as appetite loss, mal absorption of nutrients and muscle breakdown are known to contribute to malnutrition. Diarrhoeal diseases which are exacerbated by the defective hygiene and sanitation conditions and practices are likely to increase prior to the peak of malnutrition (April-June). In Renk County where two separate surveys were conducted, in the normal community and in IDP camp, the survey results showed clear disparities which were partly linked to disease. Occurrence of diarrhoea and RTI was quite higher among IDPs than among non displaced households.

In most regions of Upper Nile the access to quality health services remains a major constraint due to the limited health facilities and poor accessibility. Health seeking practices too contribute to the prevalence of diseases in the region as most of the community first confer with traditional healers when someone gets ill and only seek medical care once the condition worsens.

### **Food insecurity:**

Food access and availability remains a core issue in Upper Nile region both at individual and at household level. At individual level, children were the most disadvantaged since they cannot fend for themselves unless assisted by adults. There seemed to be very limited diet diversification amongst the surveyed locations with sorghum, wild vegetables and maize being the most predominant foods in most households. Households reported that they fed the young children on a limited variety and quantity of food, and indeed most of the households fed the children twice in a day due to inadequate food.

The populace are largely agro pastoralist whose food insecurity peaks during the rainy or cultivation season (May-August). This however, is not necessarily in tandem with the peak of malnutrition. In this region livestock and agriculture, supplemented by fish and wild foods, are the main food sources. Structural issues associated with the 20-year conflict, which ended in January 2005, were also to blame for the chronic food insecurity. These structural issues include the typical May-August hunger season, which is more acute in the Flood Plains, poor markets and market infrastructure in the entire southern

Sudan Region; continued population returns from northern Sudan; and insecurity associated with various known and unknown armed groups, and cattle raiding

In 2007 the region was characterized by flooding in most parts. Heavy rainfall in unimodal areas occurred in early July, causing localized above normal early flooding in Unity, Upper Nile and Jonglei states in the eastern sector. The hunger season was extended due to the destruction of crops. The early floods destroyed crops at a very early stage and also forced households to relocate. This scenario resulted in food shortages between October and December. Nonetheless, crops contribute less in this region particularly for poor households. These households obtain most of their food from off-farm food sources such as wild plants, game and fish, complemented by either purchase or labour exchange.

Most survey results depicted most households as having depleted their food stocks and were relying on market as the main source of food. The Malakal County survey revealed that buying was the main household source of food despite the fact that most households had limited purchasing power. Even though trade has greatly improved over the last few years since the signing of the CPA due to better accessibility and growing markets, food market prices were still seen to be quite high in most locations in Upper Nile.

### **Flaws in maternal and child care practices**

With the return of relative calm in South Sudan since the peace agreement was signed, the blame on persistent malnutrition is gradually shifting from food insecurity to underlying causes such as weak maternal and childcare practices. As a result, in the 2007 surveys a number of defective childcare practices unearthed by the results could explain the persistent high malnutrition rates. Expectant, lactating and children below five years were not fed on specialized meals despite their vulnerability and owing to additional nutrient requirements. Moreover, mothers were seen to engage in activities that prompted them to be away from home most of the day hence had very little time to take care of the young ones. Some of these activities included firewood collection, wild food gathering, fetching water, alcohol brewing among others.

Health care seeking patterns both for children and adults were seen to be generally poor. Traditional medicine is still popular as opposed to conventional medical treatment especially in the rural areas, partly due to lack of access and traditional beliefs. On the other hand breast feeding practices were not up to date and the weaning process was initiated much earlier before the recommended 6 months period. The weaning foods which mainly comprised of sorghum and wild foods were lacking essential nutrients for infants proper growth and development. Frequency of feeding among children varied depending on food availability but in most cases the presence of caretakers at home during meal times was a great determinant. Sentinel site results revealed a similar trend in Malakal and Khorfulus during last quarter as shown in the figure below.

### **Unsatisfactory water, hygiene and sanitation**

Despite the fact that River Nile and its numerous tributaries traverse most parts of Upper Nile region, potable water availability falls short of Sphere standards<sup>12</sup> and contributes to the poor hygiene and sanitation in the community. However in areas which are located far from the rivers, there are very few functional boreholes and thus rely on swamps as their main sources of water especially in the rainy season. Long queues, prolonged waiting times, reduced water output from water pumps and inadequate portable water for household use were cited in most locations including Nyirol and Wuror counties. Latrine use and availability still remains questionable in virtually all the locations surveyed in this region, thus human excreta is still disposed off indiscriminately in the open fields and bushes. Worse still, it was important to note that most people drank untreated water. This practice coupled with the haphazard waste disposal puts the community at risk of water borne diseases.

## **4. Nutrition situation and Malnutrition Trends in Bahr El Ghazal (BEG)**

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<sup>12</sup> Sphere standards on water access and quantity include; Average water use for drinking, cooking and personal hygiene per person per day is 15 liters, Queuing time not more than 15 minutes and safe water is available on regular basis.

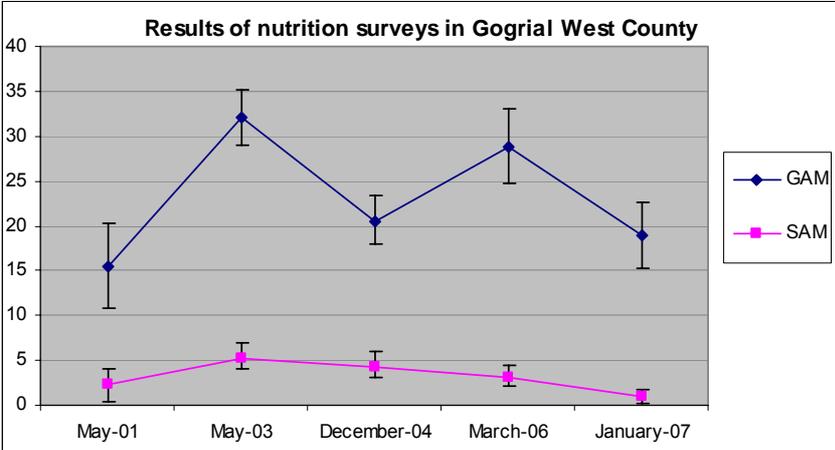
The region is geographically located in south west Sudan and borders the states of South Darfur and West Kordofan in the north, Unity and Lakes in the east and West Equatoria in the south. BEG consists of four states: Northern Bahr El Ghazal state (Aweil Center, Ayat, Aweil west, Aweil North, Abiem Center, Abiem East, Abiem West and Aweil South Counties); Western Bahr El Ghazal (Wau, North Jur river, South Jur river, Naumtina, Duiem Zubeir, Raja and Marial Bai counties); Warrap state (Tonj East, Tonj North, Tonj South, Gogrial East, Gogrial West, Twic Mayardit and Abyei Counties) and Lake state ( Rumbek Center, Rumbek East, Rumbek North, Wulu, Cuibet, Yirol East, Yirol West, and Awerial Counties).

BEG was one of the regions worst hit by the two decades of war in South Sudan. Mostly affected was Northern Bhar-el Ghazal (the Aweil Counties, bordering western Twic), which suffered a devastating famine in 1998. The area is occupied by predominantly agro-pastoralist Dinka groups, of whom the *Rek* and the *Twic* form the majority. Inter-clan/tribal conflict has been near constant among the local Dinka and with the neighbouring Nuer along the Unity State border over grazing land. Table 4 gives a summary of the surveys done in the region in 2007.

Higher GAM rates were recorded during the hunger gap period (March- July). The last quarter of the year revealed low rates, below the emergency thresh hold which was also the case in 2006. Fewer surveys were also implemented in this area compared to Upper Nile. It is important to note that all the surveys done in BEG in 2007 were mainly in Warrap and Northern Bahr el Ghazal states. No surveys were done in the other two states. A total of four surveys were conducted in the region in different times of the year out of which half revealed critical malnutrition rates while the other half were below emergency levels with respect to GAM. SAM on the other hand was on the lower side in all the surveys conducted.

Considering the results presented in table 4 and figure 1, it could be considered that the nutritional status of the population in this region has improved since the last years. However, as explained about figures 4 and 5 and as showed in figure 6, the different periods of conduction of the nutrition surveys might have an impact on the rates presented. Such an impact, although difficult to quantify, has to be taken into account.

**Figure 6: results of nutrition surveys in Gogrial since 2001**



WFP’s ANLA report (2006/7) showed that the highest percentage of households cultivating occurs in the western flood plains livelihood zone (Warrap at 91% of households and NBEG at 92%, as compared to 85% sub-national average). In Warrap, area cultivated per HH is also the highest of the 10 southern states, with over half of households (51%) planting upwards of 2 feddans compared to the sub-national average of 34% planting this amount.<sup>13</sup> The lower GAM rates during the last quarter could be attributable to the abundant fish availability during the flooding season in most locations in BEG.

Traditionally, trade networks ensured that markets were functional throughout the year and that grain was available during the hunger season for households that had run out. During the war, many markets were disrupted while others came under the control of northern troops. Many of the old markets have

<sup>13</sup> Southern Sudan Livelihood Profiles, 2006, SSCSE, FEWS NET and SCF-UK

been rehabilitated. The re-carpeting of the road from Juba through Wau all the way to Abyei has greatly improved trade in most parts of this region. Most markets such as Twic, Wunrok, Gogrial have flourished with most traders being able to transport various supplies from neighboring countries. During the hunger gap season, households were still able to access food mainly from the market at an affordable rate compared to the previous years.

As in other regions of South Sudan, acute malnutrition is understood as being the result of a combination of factors. Some of these root causes contributing to acute malnutrition might be linked with the following observations:

### **Shortcomings in child care and feeding patterns**

The widespread practice of using cows' milk as the main complementary food undoubtedly has a beneficial effect on child nutrition status. When cattle move in the dry season to low-land grazing areas (*toics*); household members who stay in the permanent settlement face reduction in access to milk. The peak in prevalence of child malnutrition in the region occurs during this time (April/May), suggesting that among other causes, the loss of this food source could be of high negative impact.

Exclusive breastfeeding undoubtedly has an effect on long-term nutritional status of children. In Twic county majority of children were being started on water before 5 months of age. This practice coupled with reducing or stopping meals when the child has diarrhea results in a high risk since children are unable to meet their daily nutrient intake needs, at a time when they are particularly nutritionally vulnerable (because of nutrient loss and mal absorption linked with diarrhea episodes).

Poor weaning practices may have contributed significantly to malnutrition among children. Sorghum and wild vegetables which lack important nutrients comprise the main weaning food. Like most of other communities in South Sudan, women spend most of their time on various household chores thus the small children are left unattended over long periods of time.

### **Disease and under utilization of health services**

Illness is a significant contributor to child malnutrition in some parts of the state. In Warrap state, health facilities reported higher incidence of respiratory infections in 2007 compared to 2006. Measles seem to have followed the same trends. Diarrhea, which is endemic in the region, was also among the leading causes of morbidity in Gogrial West.

Despite the efforts of a number of health agencies operating in the region, health-seeking patterns of the populace remains worrying, as most people do not visit the health centers whenever they fall sick but prefer consulting the traditional healers popularly known as *kunjurs*. This puts the small children at a much higher risk of malnutrition.

Access to health facilities remains very poor in the region.

### **Shortfalls in water, sanitation and hygiene practices**

The vast majority of households in Warrap were not able to treat their water despite the fact that they got their water from unsafe sources as revealed by survey results from all the locations<sup>14</sup>. The most popular forms of water treatment in some households were water filters and letting the water stand to settle, methods which are not effective enough to ensure water safety. BEG is one region where there are numerous boreholes (hand pump), nonetheless most of these boreholes are dysfunctional. The few that are functional are not able to serve the entire population.

The accessibility and quality of water is generally poor especially in the interior parts of the county and as a result most people depend on unsafe sources for their water supply such as swamps and open wells.

Generally sanitation in the surveyed areas was found to be still poor, for example in Aweil, where only very few households have access to latrines. The traditional beliefs surrounding the use of latrines (considered as a shame for many people) are a great hindrance to latrines usage even in places where

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<sup>14</sup> Cf. ACF-USA nutrition survey reports in 2007

they exist. The situation is similar in Warrap state, where there are no designated open areas for defecation. Waste disposal is very clearly visible in and around the homes. Even worse are the unhygienic practices related to hand washing more so among young children which could lead to high number of diarrhea cases.

#### **IV. CONCLUSION**

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In a bid to save lives, ACF-USA fights malnutrition through nutrition surveillance; nutrition treatment; water and sanitation, hygiene promotion, food security and livelihoods and advocacy. The 2007 nutrition surveillance activities focused on nutrition surveys, sentinel site surveillance, rapid nutrition assessments, advocacy, and capacity building.

As mentioned throughout this report, it remains difficult to analyze properly the evolution of the nutritional situation in South Sudan most affected states. Indeed, though all nutrition surveys were conducted using the SMART methodology, a standardized methodology allowing comparison, periods chosen for the conduction of the surveys did not always appear to be the same as in the past years for the same areas. Considering the high increase of malnutrition rates during the hunger gap season, which in most cases is confirmed by a higher attendance in nutrition centers, it appears essential to improve the coordination within all the humanitarian actors.

The humanitarian situation slowly improves in South Sudan, and the national and local health authorities show a promising increase in their capacity to tackle the stakes still faced by the country. This positive evolution has to be accompanied by the humanitarian actors and stake holders in order to go on building the capacity of the Sudanese in managing the health system by themselves.

ACF-USA capacity building focus aimed at following this evolution in 2007 and more emphasis on capacity building will be ensured in 2008.

In the same process, ACF-USA supported the MoH in implementing three sentinel sites in the three states of Upper Nile, Jonglei and Warap. These sites will help strongly in the analysis of the evolution of the rates of malnutrition by providing trends, instead of snapshots. The latter, has not being taken at the same period of the year, offer a poor capacity to understand the evolution of the nutritional status of the surveyed population.

Sentinel site surveillance system would allow a better understanding of acute malnutrition between the different seasons of the year and from one year to the other one.

In addition, being cheaper and easier to implement than nutrition surveys, sentinel sites will allow more empowerment of the MoH in the surveillance activities.

Rates of acute malnutrition in South Sudan remain critical in most areas, and will still require many efforts in many domains. Following its areas of expertise, ACF-USA recommends the following for 2008:

1. To strengthen the collaboration and coordination between all humanitarian actors and MoH on nutritional surveillance;
2. To build the capacity of the MOH and other partners on the management of acute malnutrition;
3. To improve advocacy activities especially at Juba and state levels through active contact with decision makers and coordination meetings to highlight nutrition priorities;
4. To expand and intensify food security and livelihood activities in order to increase private production and income generation;
5. To improve the access to safe water and Sanitation facilities and to promote healthy behavior within the more vulnerable populations;
6. To develop national guidelines and policies in the detection and management of acute malnutrition, and to fully integrate activities linked with acute malnutrition in the national health system.