

NUTRITION ASSESSMENT REPORT

MIDDLE AND LOWER JUBA PASTORAL, AGROPASTORAL AND RIVERINE LIVELIHOOD SYSTEMS

JUBA VALLEY, SOMALIA

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United Nation Children Funds (UNICEF)
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EXECUTIVE SUMMARY

In December 2007, FSAU and its partners¹ conducted an inter-agency nutrition assessment in Pastoral, Agropastoral and Riverine Livelihood Zones in Middle and Lower Juba Regions in Southwest Somalia (including Badhadhe and Kismayo districts, which were inaccessible to the assessment teams in the previous assessments). This was in response to the need to determine the levels of acute malnutrition and trends for the different livelihoods and to inform on the intervention responses for the region. The main objective of the survey was to determine the level of wasting among children aged 6-59 months and measuring 65 cm (length) – 109.9 cm (height), analyze the possible factors contributing to malnutrition, dietary diversity, morbidity, care practices and mortality rate in the specific livelihood systems in the regions.

Using a two-stage cluster sampling methodology, a total of 2831 children (979 from pastoral, 952 from agropastoral and 900 from riverine livelihoods) aged 6-59 months and with height of 65-109.9 cm from 1379 households (452 from pastoral; 453 from agropastoral and 474 from riverine livelihoods) were assessed. The mean household size was 6.3±2.2; 5.7±2.0 and 5.4±1.8 persons respectively in the Pastoral; Agropastoral and Riverine assessments while the respective mean number of the under fives per household was 2.2 ±0.9; 2.1 ±0.9 and 2.0 ±0.8.

The global acute malnutrition (GAM) rate (weight for height <-2 Z score or oedema) was **14.1%** (CI: 11.3 – 16.9) and severe acute malnutrition (weight for height <-3 or oedema) was **2.2%** (CI: 1.3-3.2) including twelve (1.2%) oedema cases among the pastoral livelihood. A GAM rate of **14.7%** (CI: 10.9 - 18.5) and SAM rate of **2.6%** (CI: 1.4 – 3.9) with twelve (1.3%) oedema cases was recorded among the agropastoral livelihood. Riverine livelihood recorded a GAM rate of **13.7%** (CI: 10.0 -17.3) and the highest severe acute malnutrition with a SAM rate of **4.4%** (CI: 2.5 – 6.4) including twenty three (2.6%) oedema cases. The Cude and U5 mortality rates were **0.93** (0.54 - 1.31) and **1.76** (0.62 - 2.90) respectively among the pastorals. Similar CMR and U5MR of **0.80** (0.45 -1.16) and **1.13** (0.49 – 1.78) respectively were reported in the agropastoral livelihood. Among the riverine population CMR of **0.72** (0.37 – 1.07) and U5MR of **1.74** (0.49 - 2.99) were reported.

When estimated using WHO Anthro (2005) Reference standards, slightly higher GAM rates and almost double SAM rates were reported. Pastoral livelihood reported GAM rate of **15.0%** (CI: 12.7 – 17.3) and SAM rate of **3.9%** (CI: 2.6 – 5.1), an increase of 6.4% and 77.3% respectively. Agropastoral livelihood assessment reported GAM rate of **16.1%** (CI: 13.7 – 18.5) SAM rate of **4.6%** (CI: 3.2 – 6.0), a relative increase of 9.5% and 76.9% respectively; while among the riverine livelihood population a GAM rate of **14.7%** (12.3 – 17.1) and SAM rate of **6.9%** (CI: 5.2 – 8.6) were reported indicating 7.3% and 56.8% relative increase respectively.

The nutrition situation in Juba pastoral and agropastoral livelihoods remain at **Serious** levels (GAM rates of 10.0 -14.9) according to WHO standards. The riverine areas, still however remain in a **Critical** nutrition situation due to critical SAM rates and more vulnerable given the reliance on one main source of livelihood (crop production) which is prone to destruction by floods; poor health, water and sanitation services and poor social support network. The confidence interval ranges overlap through all the three studies, showing that there is no statistically significant difference in the rates of acute malnutrition between the three livelihood zones and from previous assessments. The nutrition assessments conducted in June 2007 recorded a **GAM** rate of **13.4%** (11.0 – 15.8) and **SAM** rate of **1.3%** (0.5 – 2.1) in pastoral; **GAM** rate of **10.2%** (8.0 – 12.4) and **SAM** rate of **1.3%** (0.4 – 2.2) in agropastoral and **GAM** rate of **15.4%** (13.4 – 17.4) and **SAM** rate of **3.2%** (2.3 – 4.2) in riverine livelihoods respectively, indicating a **Serious** nutrition situations in pastoral and agropastoral livelihoods and a **Critical** nutrition situation in riverine population.

¹ UNICEF, World Vision, World Concern, SRCS, Muslim Aid and Mercy USA

The crude and U5 mortality rates were **0.93** (0.54-1.31) and **1.76** (0.62-2.90) respectively among the pastoralist livelihood. Similar CMR and U5MR rates of **0.80** (0.45 – 1.16) and **1.13** (0.49 -1.78) respectively were reported in the agropastoral livelihood. Among the riverine CMR of **0.72** (0.37 – 1.07) and U5MR of **1.74** (0.49-2.99) were reported. The under five year mortality rates for the three assessments were below the emergency threshold of *2/10,000/day* and in the 1.00 – 1.99 range indicating **alert** situation according FSAU Nutrition categorization table and **acceptable** levels according to WHO. The Crude Mortality Rates were in the 0.50-0.99 range, also below the emergency threshold of *1/10,000/day* levels again indicating **alert** situation according FSAU Nutrition categorization table and **acceptable** levels according to WHO standards. Most of the deaths were associated with diarrhoea.

The incidence of reported diarrhoea in Pastoral, Agropastoral and Riverine populations (28.5%; 24.1% and 25.8% respectively) within two weeks prior to the assessment remained high. High incidences of ARI and febrile illnesses (suspected malaria) were also reported in the three livelihoods (Table 4.5). Results of rapid diagnostic test for *P. falciparum* show that malaria is endemic in Juba valley with rates of **14.5%**, **13.6%** and **16.4%** reported in the assessed Pastoral, Agropastoral and Riverine populations. These levels were consistent with seasonal morbidity patterns recorded from the health facilities. Overall, the assessment revealed high levels of morbidity in Juba valley region where at least 51% of the assessed children had some form of illness in the two weeks prior to the assessment. Morbidity has direct relationship with acute malnutrition where illness lead to increased nutritional demands to repair worn out tissues and at the same time interfering with the intake, digestion, absorption and utilization of the nutrients in the body. Analysis continues to show strong significant association between acute malnutrition and morbidity rates. Children who had been ill within two weeks prior to the assessment, especially from diarrhoea were more likely to be acutely malnourished ($p<0.05$).

Poor coverage for health programmes are important risk factors to the poor nutrition situation in Juba regions. Measles vaccination coverage for eligible children (9-59 months old) was still very low at only 28.3% as was coverage for vitamin A supplementation (26.7%) in the assessed pastoral population. Among the assessed children in agropastoral livelihood, less than half had received vitamin A supplements (49.5%) and measles vaccine (48.7%) in the last six months (are you including measles in the 6 months period as well?). Coverage for the health programmes (including polio immunization) fell below the recommended 95% level (Sphere, 2004) in all the three livelihoods.

The food security situation in Juba has been improving following good *Gu* '07, and the *Deyr* '07/08 seasons with households continuing to benefit from good livestock body conditions for all species, high rates of calving, kidding and lambing; increased milk production; high livestock prices and favourable terms of trade. Juba received above average *Deyr* 07 rains which resulted in good harvest yield among the agropastoral and riverine populations. Middle Juba for instance recorded the second best cereal production this season (173%) after Gedo (291%) followed by Bakool (165%) compared to the Post War Average (PWA). In addition to improved cereal production, the riverine population are also benefiting from the availability of job opportunities in riverine areas, including fishing in the *Desheks*. Nevertheless, the riverine population in Lower Juba are still faced with **Humanitarian Emergency**. Areas of Kismayo and Jamame of Lower Juba experienced poor rainfall causing crop failure (L Juba had only 35% of PWA cereal production) in both riverine and agropastoral livelihoods. Except for the agropastoral and riverine areas of Lower Juba, which are classified to be faced with **Acute Food and Livelihood Crisis**, Juba valley is currently classified to be **Generally Food Insecure** and the situation is expected to remain stable.

Table 1.1 SUMMARY OF THE FINDINGS

	Pastoral		Agropastoral		Riverine	
Indicator	N	%	N	%	N	%
Total number of households surveyed	452	100	453	100	474	100
Mean household size	6.3	SD=2.2	5.7	SD=2.0	5.4	SD=1.8
Total number of children assessed	979	100	952	100	900	100
Child sex: Males (boys)	484	49.4	484	50.8	451	50.1
Females (girls)	495	50.6	468	49.2	449	49.9
Global Acute Malnutrition (WHZ<-2 or oedema)	138	14.1 (11.3 - 16.9)	140	14.7 (10.9 - 18.5)	123	13.7 (10.0 - 17.3)
Severe Acute Malnutrition (WHZ<-3 or oedema)	22	2.2 (1.3 - 3.2)	25	2.6 (1.4 - 3.9)	40	4.4 (2.5 - 6.4)
Oedema	12	1.2 (0.6 - 1.9)	12	1.3 (0.5 - 2.0)	23	2.6 (1.1 - 4.0)
GAM estimates by WHO Anthro (2005) Standards:	147	15.0 (12.7 - 17.3)	153	16.1 (13.7- 18.5)	132	14.7 (12.3 - 17.1)
SAM estimates by WHO Anthro (2005) Standards:	38	3.9 (2.6 - 5.1)	44	4.6 (3.2 - 6.0)	62	6.9 (5.2 - 8.6)
Global Acute Malnutrition (WHM<80% or oedema)	90	9.2 (6.7 - 11.6)	87	9.1 (6.2 - 12.1)	97	10.8 (7.4-14.1)
Severe Acute Malnutrition (WHM<70% or oedema)	14	1.4 (0.7 - 2.1)	13	1.4 (0.6 - 2.1)	27	3.0 (1.4 - 4.6)
Proportion of malnourished (MUAC<12.5 cm or oedema))	50	5.7 (3.7 - 7.6)	61	7.3 (5.2 - 9.5)	65	8.4 (5.8 - 11.0)
Proportion of severely malnourished (MUAC<11.0 cm or oedema))	12	1.4 (0.6 - 2.1)	4	0.5 (0.0 - 0.9)	11	1.4 (0.4 - 2.4)
Proportion of stunted children (HAZ<-2)	124	12.7 (8.9-16.4)	222	23.3 (16.8-29.8)	325	36.1 (31.6-40.6)
Proportion of underweight children (WAZ<-2)	190	19.4 (14.4-24.4)	309	32.5 (26.2-38.7)	295	32.8 (28.4-37.1)
Proportion of acutely malnourished pregnant women (MUAC≤23.0)	33	35.5 (N=93)	44	44.0 (N=100)	47	34.8 (N=135)
Proportion of severely malnourished pregnant women (MUAC≤20.7)	9	9.7	16	16.0	11	8.1
Proportion of children with diarrhoea in 2 weeks prior to assessment	279	28.5 (20.7-36.3)	229	24.1 (16.6-31.5)	232	25.8 (20.8-30.7)
Proportion of children with ARI within two weeks prior to assessment	307	31.4 (23.8-39.0)	265	27.8 (19.9-35.8)	256	28.4 (22.9-34.0)
Children with fever/ suspected malaria in 2 weeks prior to assessment	240	24.5 (20.1-29.0)	216	22.7 (16.7-28.7)	197	21.9 (17.0-26.8)
Proportion confirmed with malaria (RDT positive)	218	14.5 (N=1501) (9.3 - 19.7)	205	13.6 (N=1503) (10.2 - 17.1)	246	16.4 (N=1500) (10.4 - 22.4)
Suspected measles within one month prior to assessment	47	5.1 (3.6 - 6.6)	44	4.9 (3.4 - 6.4)	62	7.5 (5.0 - 10.1)
Children (9-59 months) immunised against measles	262	28.3 (19.0-37.7)	437	48.7 (33.3-64.0)	578	69.6 (62.2-77.1)
Children who have ever received polio vaccine	655	66.9 (58.2-75.6)	740	77.7 (71.7-83.8)	794	88.2 (83.1-93.4)
Children who received vitamin A supplementation in last 6 months	261	26.7 (17.5 - 35.8)	471	49.5 (34.8-64.2)	595	66.1 (57.6-74.6)
Proportion of households who consumed ≤3 food groups	144	31.9 (27.6-36.4)	143	31.6 (27.4-36.1)	87	18.4 (15.0-22.2)
Proportion of children 6-24 months who are breastfeeding	142	43.8 (36.0-51.7)	165	50.0 (42.9-57.1)	184	53.2 (47.5-58.8)
Under five Death Rate (U5DR) as deaths/10,000/ day	1.76 (0.62-2.90)		1.13 (0.49-1.78)		1.74 (0.49-2.99)	
Crude Death Rate (CDR) as deaths/10,000/ day	0.93 (0.54-1.31)		0.80 (0.45-1.16)		0.72 (0.37-1.07)	

The generally stable nutrition situation noted in Juba regions are associated with the positive impacts of the Post Gu' 07 and Deyr 06/07 rains which have contributed to livestock recovery for most species (except cattle) and good crop production, in addition to increased access to humanitarian support. Despite the improvement in food security situation, the nutrition situation remain **Serious** pastoral and agropastoral and **Critical** in riverine livelihood and have not indicated any significant change over the past six months (since Post Gu '07).

Insecurity, unemployment, stressed livelihoods, poor child feeding and poor access to health services remain the main underlying causes of malnutrition in Juba regions . Juba has experienced sporadic armed conflict for over 10 years with devastating effects on education, labour, food security and economic development in the region. Feeding practices for children are persistently poor, preventable diseases are prevalent and access to maternal and child care is suboptimal in the region. Poor dietary diversity; reported high rates of morbidity, poor feeding and care practices aggravate the nutrition situation in these regions. Almost one third of the assessed households were reported to have consumed a less diversified diet (fewer than four food groups) in the previous 24 hours.

Intervention efforts that address both immediate life saving needs especially for the severe malnutrition cases in addition to developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms are recommended.

Specific recommendations include:

Immediate Interventions

- Improving coverage for health programmes, especially for measles vaccination and vitamin A supplementation. Vigorous campaigns are required in Juba regions especially among the pastoral community.
- Rehabilitation of acutely malnourished children through selective feeding programs until household food security is restored and critical public health issues are addressed. All options to address this through effective and non-damaging measures need to be considered. Capacity building of the existing Health Facility and the community to manage acutely malnourished children could be explored.
- There is need to focus on programmes that improve and sustain dietary diversity and consumption of micronutrient rich foods.
- There is need to have intervention to control flooding by the riverbanks
- Intervention programmes on water, sanitation and hygiene practices including health education
- Addressing the high rates of malnutrition in pregnant and lactating women.

Long term Interventions

- To address the issues of limited access to safe water, there is a need for rehabilitation/protection of water systems including the well and water catchments (such as capping of wells) in anticipation of seasonal flooding. The community should be trained on sanitation of the water systems
- Provision of large water containers for fetching and storage of water would contribute in easing water problems where people have to cover long distance to get water and yet they are unable to carry large volume of water.
- To initiate income generating activities to improve the socio-economic situation in Juba regions. Introduction of small-scale credit system for small business would help improve livelihoods especially among the riverine community.

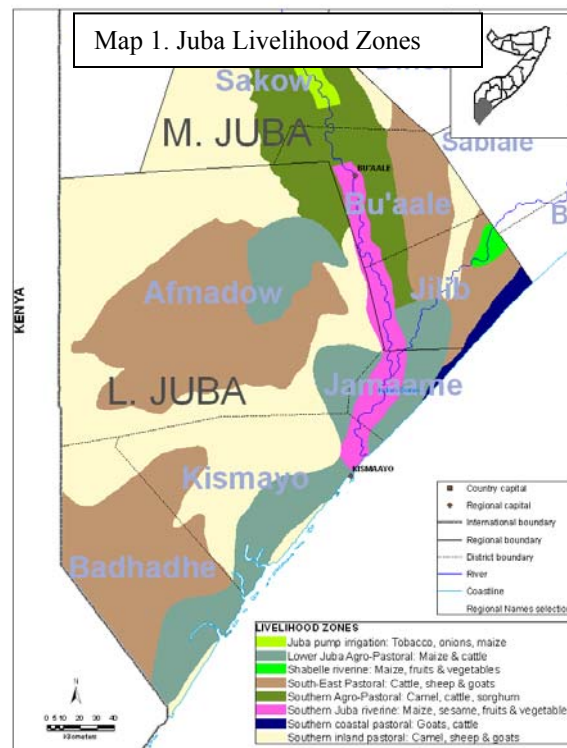
- There is need for establishment or strengthening of health facilities and satellite services especially in rural villages where there are no health facilities
- Intensifying health and nutrition education activities at the household level to address care concerns, targeting mothers, and other caregivers. The main areas of focus should include promoting exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvements in household hygiene including health care practices.
- Canal rehabilitations, provision irrigations pumps, fuel for irrigation and spare parts to the Riverine communities in Juba Valley

1.0 INTRODUCTION

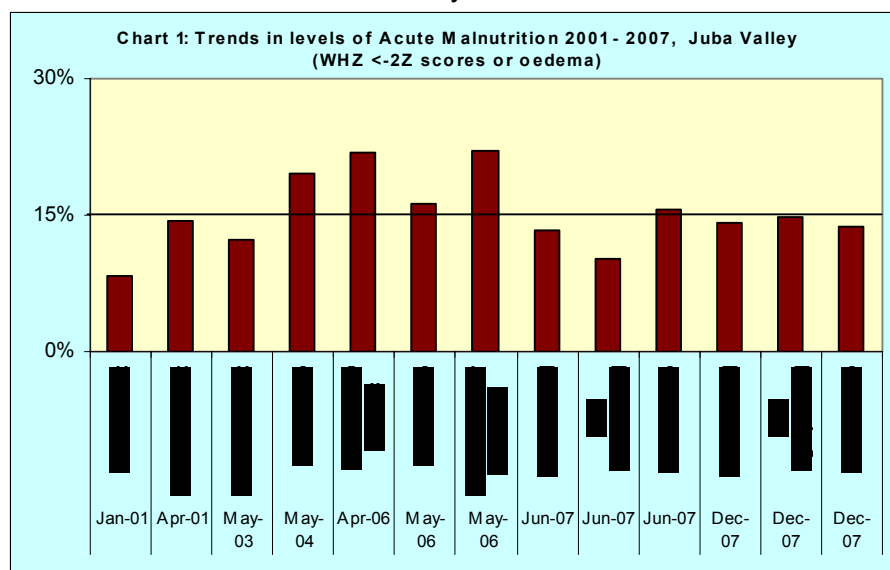
Historical Context

The Middle and Lower Juba Regions are located in the Juba Regions in Southern Somalia (See Map 1). The regions border Kenya to the west, the Indian Ocean and the Lower Shabelle to the southeast, Gedo to the north and Bay to the East. The Middle Juba Region comprises three districts (Bu'aale, Sakow/Salagle and Jilib) and the Lower Juba, five districts (Badhadhe, Hagar, Afmadow, Kismayo and Jamame). The total population of the ²two regions is 624,667 and falls into five livelihood zones³: The Riverine, Pastorals, Agro-pastorals, Coastal and Urban.

Since the collapse of the Somali Central Government in 1991, South and Central Somalia including the Middle and Lower Juba Regions have faced a series of disasters, both natural (floods and droughts) and man-made (poor governance, sporadic armed conflict and widespread human rights abuses); The aftermaths of which have been limited resilience for parts of the population to recover from shocks. The FSAU Integrated Phase Classification series of Maps⁴ from 2004 highlights sustained Humanitarian Emergency (HE) or Acute Food and Livelihood Crisis (AFLC) in parts of the Middle and Lower Juba Regions. For the Riverine group, the humanitarian emergency situation has been sustained for over three years.



Historical data on nutrition surveys conducted in the Middle and Lower Juba Regions indicates



Serious to **Critical** nutrition situation (WHO classification) with global acute malnutrition levels ranging from 10-22.0%, Weight for height z scores, WHZ, or presence of bilateral oedema (See Chart 1). Whereas a direct comparison between earlier assessments is not possible due to the varying location and timings of the assessments, with the exception of Buale District assessment (January 2001), these trends illustrate a persistent **Serious - Critical** nutrition situation with results

² Middle Juba has a population size of 385,790 and Lower Juba of 238, 877

³ The Baseline Profiles are currently being revised by FSAU

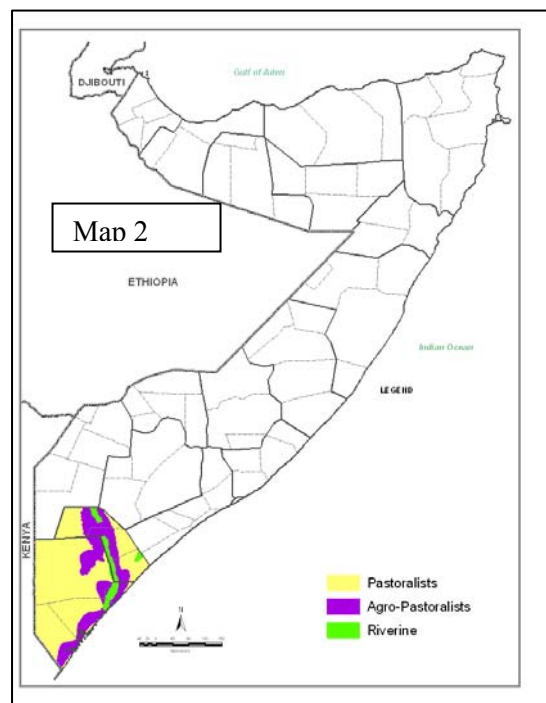
⁴ FSAU Monthly Nutrition Update, January 2008; page 2

of >10%, being reported throughout 2001 to date. However, of note is the downward or stable trend in the prevalence of acute malnutrition in 2007.

The Food Security Context

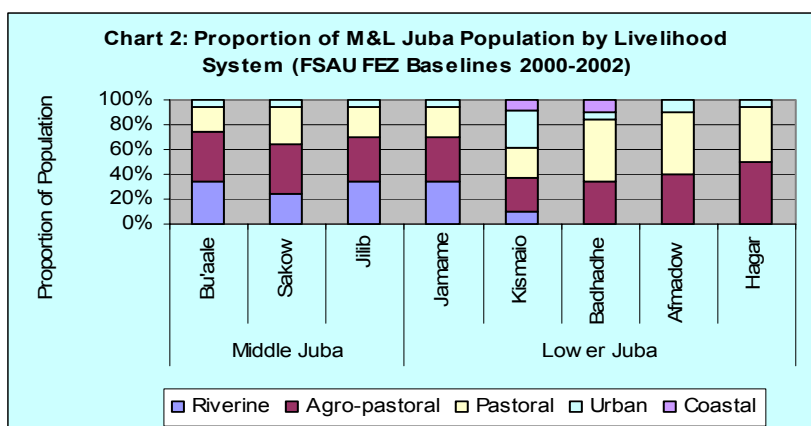
The **pastoral** livelihood system (see map 2) is ⁵predominant with about 34.5% of the Middle and Lower Juba population engaged in cattle, camel, goat and/or sheep rearing. Their main source of income is sale of livestock products (milk, ghee; meat) as well as live animals. Livestock, especially cattle, are normally traded in Kenya, with good prices during the ⁶*Gu* and *Deyr* season as well as the beginning of the ⁷*Jilaal* (January – March). Pastoralists are most vulnerable to acute malnutrition and food insecurity during drought or in the dry seasons of *Jilaal* and *Hagar* when there is little or no access to pasture and/or water to sustain their livestock; or when the Kenyan border is closed, restricting their access to livestock markets.

The second most important livelihood system is the Agro pastoral practiced by 29.4% of the Juba Valley population. **Agro-pastorals** combine livestock rearing (cattle, camel; shoats) with agricultural (maize and sorghum) production. The Agro-pastoral crop fields depend on rain or *dhesheks*⁸ for water. During the cultivation period (*Gu* and *Deyr* rainy seasons), animals are moved away from the farming area resulting in reduced access to milk. In the dry season livestock are moved towards *dhesheks* and riverine areas, with core households remaining at home. Depending on the type and size of crop establishments and livestock stocks at their disposal, Agro Pastorals may have more options for dealing with shocks that predispose them to nutrition and food insecurity.



The **Riverine** livelihood group constitutes of pure farmers who live within three kilometres of the Juba River. They mainly access food and income through production and sale of crop. They are sedentary, keep negligible stocks of livestock, and are highly vulnerable to nutrition and food insecurity in the event of shocks such as floods and crop failure in the *Gu* and *Deyr* seasons.

The **Urban** group's main source of livelihood constitutes of employment, trade and casual labour. Food is mainly accessed through purchase; therefore a secure environment that enables access to income and essential basic



⁵ FSAU Livelihoods Baseline Profile, 2000.

⁶ *Gu* refers to the long rains (April – June) while *Deyr* refers to the short rains (October-December) seasons.

⁷ *Jilaal* refers to the hot and dry (January - March) season; *Hagar* refers to the cool and dry (July – September) season

⁸ *Dheshek* refers to water holding depressions, where recession cropping is commonplace

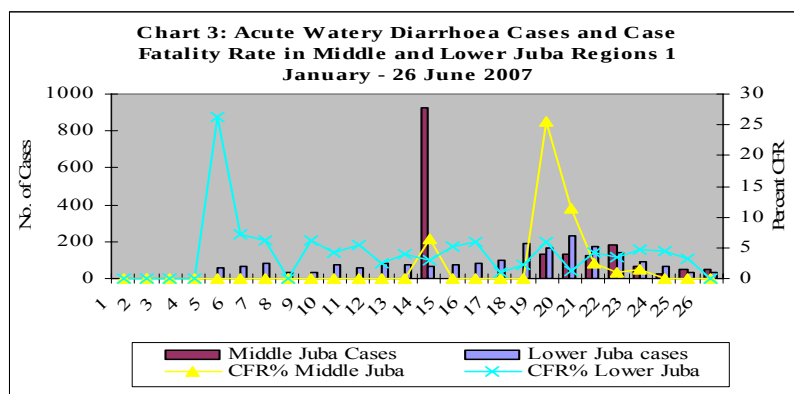
services is critical for sustained nutrition and food security. The coastal group of Kismayo and Badhadhe undertake fishing and collect lobsters for food and income generation as their main livelihood. They are mostly vulnerable to nutrition and food insecurity in June – September when the sea is rough and fishing becomes dangerous. *Chart 2* highlights the proportions of the Juba population by livelihood.

Following the FSAU Post *Gu* '07 analysis, the livelihood groups in Middle and Lower Juba Valley were faced with either **Humanitarian Emergency or Acute Food and Livelihood Crisis** with the nutrition situation ranging from **Serious** to **Critical**. This was an improvement from the emergency situation experienced in the previous years since *Gu* '05. The improvement started with good *Deyr* '06/07 rains that contributed to an improved rain fed crop and livestock production in the pastoral and agro pastoral livelihood zones, leading to an improved food security situation. In spite of this improvement in parts of the region, following severe flooding the riverine livelihood zone which was faced with a critical nutrition situation was classified in the IPC as in a **Humanitarian Emergency**.

The current analysis illustrates the continuing positive impact of the *Gu* '07, and the *Deyr* '07/08 rains complimented by significant humanitarian interventions in the region, which have led to a significant improvement in the food security and stable nutrition situation in Middle and Lower Juba regions for the agropastoral and riverine groups. The pastoral population in Juba has also experienced recovery of pasture and herd sizes from the earlier drought in '05/06, improving availability of milk and milk products, high livestock prices, high and improved terms of trade. Juba received above average *Deyr* 07 rains which resulted into good harvests among the agropastoral and riverine populations. Middle Juba for instance recorded the second best cereal production this season (173%) after Gedo (291%) followed by Bakool (165%) compared to the PWA. In addition to improved cereal production the riverine population are also benefiting from the availability of job opportunities in riverine areas, including fishing in the *Desheks*. Nevertheless, the riverine population in Lower Juba were exceptional and are still faced with **Humanitarian Emergency**. Areas of Kismayo and Jamame of Lower Juba experienced poor rainfall causing crop failure (L Juba had only 35% of PWA cereal production) in both riverine and agropastoral livelihoods.

Health context

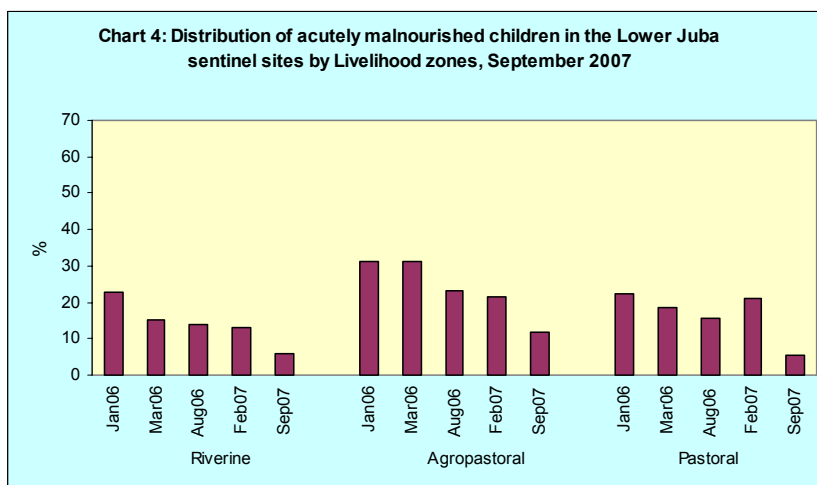
As mentioned earlier, the Juba Regions are highly susceptible to flooding and thus to water borne diseases. In 2007 there was a wide spread epidemic of Acute Watery Diarrhoea (AWD) throughout the country with no exception in the Juba Region. *Chart 3* provides a summary of AWD cases and CFR in Middle and Lower Juba Regions from January 1st – June 26th, 2007 (Source of Data: WHO AWD June 28th Update). In total from Jan 1st to 29th June, 1,690 cases of AWD were reported in Middle Juba with a Case Fatality Rate of 7.16%. In Lower Juba 2000 cases have been reported in the same period with a lower, yet still concerning, CFR of 4.35%. *Chart 3* provides a summary of AWD cases and CFR in Middle and Lower Juba Regions from January 1st – June 26th, 2007 (Source of Data: WHO AWD June 28th Update). Lower and Middle Juba reported 614 cases from seven different districts in epidemiological week 1- 4 of 2008. Fifty four percent (334/614) of the cases were reported from Jilib district. No deaths were reported. All stool samples were tested negative of *V. Cholerae*. One of the biggest challenges in the Juba's and in South Somalia in general is the delivery of humanitarian assistance which, when delivered in a timely manner, can greatly



reduce the fatalities associated with AWD. However limited access by humanitarian actors, due to the ongoing insecurity and poor road conditions, prevent the needs of the population being met. Benadir hospital received 120 cases of AWD with 3 related deaths (CFR 2.50%) in the same period. As a follow up of the AWD response, **UNICEF** supplied Benadir hospital with one drum of chlorine, 2 sets of sanitation tools and 10 cartons of Oral Rehydration Salts (ORS). **WHO** collected water samples from 12 different wells. **MSF** has completed inventory of stock for the cholera response and will make essential supplies in preparedness of an outbreak available to the Forlanini Cholera Treatment Centre (CTC). **UNFPA** has proposed to distribute hygiene kits to the maternity and diarrhea wards at the Benadir hospital.

Nutrition Context

The overall nutrition situations in the Pastoral and Agropastoral livelihoods in Juba remain **Serious** while the situation in riverine has remained persistently **Critical** and have not indicated any significant change over the past six months (since Post Gu '07). The areas however have shown a continued track of improvement in food security indicators associated with the positive impacts of the Post Gu' 07 and Deyr '06/07 rains which have contributed to livestock recovery for most species (except cattle) and good crop production, in addition to increased access to humanitarian support. The agropastoral and riverine livelihoods in Jamame and Kismayo who experienced crop failure are however still faced with **Acute Food and Livelihood Crisis**. Reported high rates of morbidity, poor feeding and care practices continue to aggravate the nutrition situation in these regions. In addition ongoing risk of conflict and poor infrastructure has constrained humanitarian services in the regions.



The most recent sentinel site surveillance data⁹ showed that nutrition situation in these areas is consistent with the food security analysis classified as serious in the Pastoral and Agro pastoral populations and critical in the Riverine populations. Additional information from Maternal and Child Health Centres showed similar trends in acute malnutrition in the regions. Communicable diseases especially the acute watery diarrhoea outbreak aggravated the nutrition situation as highlighted above. Therefore in order to determine the current nutrition situation, FSAU and partners conducted three nutrition assessments in Juba regions (Middle and Lower Juba) in December 2007 based on three main livelihood systems:- Pastoral, Agropastoral and Riverine livelihood systems (See map 2). The two stage cluster sampling technique of 30 by 30 was used. Hence 900 - 979 children were assessed at household level, while retrospective mortality assessment was conducted in 903-906 households (irrespective of whether or not they had an under five) in each assessment.

In general, compared to the situation in Gu' 07, the nutrition situation in Juba, remains **Serious** among the pastoral and agropastoral livelihoods, and **Critical** among the riverine population, but depicts a slight improvement from **Critical** levels and **Very Critical** levels observed in the region since 2004 (See Chart 1).

The Historical timeline of events in the Middle and Lower Juba Regions and their potential

⁹ FSAU Nutrition Update Jan 2008

contribution to the sustained **Serious** nutrition situation is provided in the table below.

Historical Timeline of Events In Middle and Lower Juba Regions and Their Potential Contribution to The Sustained Serious Nutrition Situation		
Year	Events And Potential Risk Factors for Acute Malnutrition	Nutritional Status Outcome
1991	• Collapse of the Somalia Central Government and with it, governance problems and sporadic armed conflict in the Middle and Lower Juba Regions. This led to widespread human rights abuses, interruption to normal livelihood practices and reduced access to food and health care services. • Heavy fighting and insecurity in Kismayo leads to heavy looting of crops, livestock and assets in the surrounding areas. • The Gu rains are average but the Deyr rains failed. This marks the beginning of drought conditions reported in parts of South and Central Somalia and leads to reduced availability of meat, milk and milk products for consumption, livestock deaths and crop failure. • Massive displacement of people within Somalia and across the border into refugee camps in Kenya in search of assistance • Food Economy Baseline Profile (2000): A Poor – Medium year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	<i>Nutrition data not available this year for Juba</i>
1992	• Ongoing insecurity across the two Juba Regions limits access for humanitarian actors • Drought and famine conditions continue in the South. Total collapse of livelihoods following massive livestock deaths (limiting access to meat, milk and milk products for consumption) and crop failure. This leads to high numbers of internally displaced populations within the region and across the border to Kenya • ICRC provides relief food in region • 'Operation Restore Hope', UNITAF, commences in Somalia December 1992 • FSAU Baseline Profile: A Bad year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	<i>Nutrition data not available this year for Juba</i>
1993	• Ongoing insecurity and fighting with populations Kismayo and Sakow badly affected • UNISOM takes over from 'Operation Restore Hope' (UNITAF) in May, enabling humanitarian food assistance to commence in South Somalia, including the Middle and Lower Juba regions. UNISOM sponsors 'Kismayo Airport Juba land reconciliation'. • End of the drought. Improved rainfall leading to increased production in both agriculture and livestock sectors • A cholera outbreak in the Juba Valley mainly in the Agro pastoral and pastoral areas which kills large numbers of people • FSAU Livelihood Profile: A Normal-Good year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000)	<i>Nutrition data not available this year for Juba</i>
1994	• UNISOM's continued presence in Somalia • The Somali Aid Coordination Body established to coordinate humanitarian response in Somalia • UNHCR coordinates refugee repatriation movement from Kenya to Juba • The Absame tribe peace conference is held in Doble • Medium rains are received, pasture becomes available and livestock conditions and production are good. Crop production is	<i>Nutrition data not available this year for Juba</i>

	- good and prices of food commodities normal across the regions. - FSAU Baseline Profile: Good year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	
1995	- UNISOM withdraws from Somalia due to heightened insecurity. - UNHCR repatriates Middle and Lower Juba refugees from Kenyan camps - Gu & Deyr rainfall failure causing crop failure and poor livestock condition - FSAU Baseline Profile: Good year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	Nutrition data not available this year for Juba
1996	- Average crop production but very poor livestock condition - Massive livestock slaughter due to disease (suspected severe Foot and Mouth Disease) and drought. - Southern Somalia is classified as a humanitarian emergency zone by the UN Appeal for 1996/97 - Refugee movement to Kenya - FSAU Baseline Profile: A Bad year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	Nutrition data not available this year for Juba
1997	- El-Nino rains, increasing water and pasture availability, resulting in good livestock production in the short term. However, with continued heavy rains, large numbers of people, shoats and camel deaths occur. An unknown camel disease leading to Carmel deaths is reported. - The persistently heavy rains cause serious floods, deaths and extensive damage to infrastructure and property. Hundreds of thousands of people are displaced and significant crops and livestock lost. Flood recession commences towards the end of the year. - Communicable disease outbreaks mainly, malaria and acute watery diarrhoea, causing high mortality are reported - FSAU Baseline Profile: A Mixed Year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000).	Nutrition data not available this year for Juba
1998	- Rift valley fever outbreak in Juba Valley following El-Nino floods - The Saudi Arabian Government, the main importer of Somalia's livestock imposes a ban due to RVF. This leads to reduced income access options for Somalia including Middle and Lower Juba Regions - Pasture and water availability normal - High infestation of birds and rats severely attack crop causing major damage. Suspected anthrax and tick borne diseases attack livestock. - There is serious clan fighting in Sakow District from November 1998-April 1999. - FSAU Baseline Profile: A Mixed year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000), February-April 2000)	Nutrition data not available this year for Juba
1999	- Battle for control of Kismayo continues - Normal Gu rains and production but the Deyr is below normal - FSAU Baseline Profile: A Normal Year	Nutrition data not available this year for Juba

(Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000)		
2000	- There is unusual live-stock migration from Kenya, M&L Juba to the Juba riverine areas for pastures and water, due to the drought - Crop and livestock production are low - The livestock ban imposed by the gulf countries in 1998 on Somali livestock due to Rift Valley Fever (RVF) still in place - FSAU Baseline Profile: A Normal Year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; Inter Agency Assessment Gedo Region, February-April 2000)	Nutrition data not available this year for Juba
2001	- Continued unusual livestock migration to the Juba riverine areas for pastures and water, due to the drought - Closure of the Kenya- Somalia border due to conflict and insecurity in the Juba areas - Disrupted trade link between Juba Valley and Mogadishu due to fighting in the riverine areas - FSAU Baseline Profile: A Bad Year (Sources: FSAU Food Economy Baseline Profile, 2001-2002, FSAU Nutrition Update for April 2007; FSAU Monthly reports for February & August 2001, Inter Agency Assessment Gedo Region, February-April 2000)	- FSAU/UNICEF Bu'aale District Survey GAM: 8.4% (W/H <-2z score or oedema) - FSAU/UNICEF Jamame District survey (April 2001): GAM: 14.3% (W/H <-2z score or oedema)
2002	- Poor Deyr '01/02 rains lead to significant crop failure and out-migration of livestock in search of water and pasture. There is significant loss of assets especially in the poor wealth groups and cereal prices become extremely high and inaccessible for majority of the poor - Light Gu rains lead to an improvement in water and pasture availability, and crop production. Cereal prices reduce with the Gu harvest and become accessible. - FSAU Baseline Profile: A Very Bad Year (Source: FSAU Monthly Reports, February 02; July-Aug 02; FSAU Food Economy Baseline Profile 2001-2002)	- Afmadow Town (FSAU April 2002), Rapid MUAC assessment with 9.5% identified as acutely malnourished (N=200) with MUAC (<12.5cm or oedema) - Hagar Town (FSAU April 2002), Rapid MUAC assessment with 10.5% identified as acutely malnourished (MUAC < 12.5 cm) - Jilib District, 8 villages (FSAU October 2002), Rapid MUAC assessment with 14.6% identified as acutely malnourished with MUAC < 12.5 cm (N=365) (Source: Nutrition Updates for April & October 2002)
2003	- Poor Deyr 02/03 performance in Afmadow and Hagar but average - normal in the riverine areas (FSAU Monthly Report for March 2003) - Food insecurity situation following poor Gu 2003 rains. The (FSAU Monthly Report for July, Aug 2003) - Insecurity disrupts seasonal migration of agro pastoralists and pastoralists to grazing areas, leading to food insecurity in these groups (Sources: FSAU Monthly reports August-December 2003)	- Kismayo District survey (May 2003): GAM: 12.2% (W/H <-2z score or oedema) - Jilib riverine villages (FSAU, July 2003): MUAC assessment recorded 28% acute malnutrition (MUAC<12.5 or oedema). - Jilib riverine villages (FSAU, Oct 2003): MUAC assessment recorded 14.8% acute malnutrition (MUAC<12.5 or oedema). - Kismayo IDP rapid assessment (FSAU, March 2003): 21% acute malnutrition amongst under fives (MUAC< 12.5 cm or oedema).
2004	The FSAU Post Gu '04 Analysis: 54,000 people in the riverine community of the Middle Juba are faced with a Humanitarian Emergency and 61,000 with a Livelihood Crisis due to chronic and on-going civil insecurity. Consecutive seasons of near crop failure, unaffordable food prices, limited income earning opportunities, and limited social	- FSAU/UNICEF: Jilib riverine survey (May 2004): 19.5% GAM (W/H <-2z score or oedema) and U5MR of 5.4/10,000/day - FSAU Post Gu Integrated Nutrition

	support networks have pushed this fragile group into a state of humanitarian emergency. An additional 59,000 agro-pastorals and pastorals face a livelihood crisis in Afmadow and Jamame Districts. Therapeutic and supplementary feeding programs by MSFH on-going in Marere, Jilib District (Source: The FSAU Post Gu '04 Analysis, Technical Series Report IV.2 Sept. 2004)	Situation Analysis indicates: A Critical Nutrition Situation coupled with high disease burden ((Source: The FSAU Post Gu '04 Analysis, Technical Series Report IV.2 Sept. 2004)
2005	FSAU Post Deyr '04/05 Analysis: - Juba Riverine areas are of significant concern due to the continuing and chronic state of Humanitarian Emergency, with an estimated 83,000 people in a state of Humanitarian Emergency with no improvement since the previous FSAU assessment in Sept '04. - Excessive rains and river floods destroyed more than half of the maize production. Civil insecurity, the main underlying cause of the areas vulnerability, continues to disrupt economic activities and undermine people's livelihoods food security and well being FSAU Post Gu '05 Analysis: 116,000 people in the Middle and Lower Juba Valley are in a state of Chronic Humanitarian Emergency, with a further 20,000 in a state of Acute Livelihood Crisis. - The deteriorating situation of the Juba Riverine communities is attributed to the devastating floods during the May-June 2005 which destroyed standing crops (including fruit trees) and underground granaries or bakaars, submerged farmers and villages, destroyed feeder roads and cut-off settlements and villages from the main towns and markets. - The pastoral and agro pastoral populations in the Juba valley region in a state of Alert. (Sources: The FSAU Post Deyr '04/05 Analysis, Technical Series Reports IV.3 Feb 2005; The FSAU Post Gu'05 Analysis, Technical Series Reports IV.7 Sept. 2005) - Therapeutic and supplementary feeding programs by MSFH on-going in Marere, Jilib District (Source: MSFH 2005, Monthly reports on Therapeutic and supplementary feeding programs)	- FSAU Post Deyr 04/05 Integrated Nutrition Situation Analysis indicates A Critical Nutrition Situation in M&L Juba and Very Critical Nutrition in the Riverine areas (Source: The FSAU Post Deyr 04/05 Analysis, Technical Series Report IV.3, February 28, 2005) - FSAU's first round of sentinel sites conducted in 8 sites in Juba indicate levels of acute malnutrition of >15% WHZ or oedema. - Bu'aale riverine (Sukeyla village) (FSAU, July 2005): MUAC assessment recorded 27.4% acute malnutrition (MUAC <12.5cm or oedema)
2006	FSAU Post Deyr'05/06 Analysis: - An estimated 235,000 people in Middle and Lower Juba face a Humanitarian Emergency and 110,000 face an Acute Food and Livelihood Crisis as a result of prolonged drought that has led to crop failure and loss of livestock. All livelihood systems are affected. Juba Riverine community are now faced with 'Sustained Humanitarian Emergency' for preceding 3 years. - The Middle and Lower Juba are also hosting a large number of people from north eastern Kenya and Gedo, who have migrated into the area and have settled around strategic boreholes and water points along the Juba River. FSAU Post Gu'06 Analysis: 210,000 in Middle and Lower Juba Regions are faced with a Humanitarian Emergency and 87,000 an Acute Food and Livelihood Crisis - The overall performance of the Gu rains throughout the season was poor, both in intensity and distribution over time and geographically, despite some improvement in pasture and browsing conditions in the hinterland. Water availability is critical. Many pastoralists and agro pastoralists have migrated towards the riverine and coastal areas in search of water due to water shortages and high competition for resources from in-	- FSAU Post Deyr 05/06 Integrated Nutrition Situation Analysis indicates A Critical Nutrition Situation coupled with high disease burden in the Middle Juba and a serious nutrition situation in the Lower Juba areas (Source: The FSAU Post Deyr 05/06 Analysis, Technical Series Report IV.8 February 2006); - Jilib Riverine Nutrition assessment (May 06) indicates a critical situation with GAM of 16.2% (w/h<-2 z score or oedema); - Afmadow Hagar Districts Nutrition Assessment (May 06) with GAM of 22.0 % - Bu'aale, Sakow Apr-06 Districts Nutrition Assessment with GAM of 21.9% (w/h<-2 z score or oedema) (Source: Nutrition Survey Reports) - FSAU Post Gu'06 Integrated Nutrition Situation Analysis indicates Critical -

	migrated livestock from the Gedo and North-eastern Kenya. - o Middle and Lower Juba regions have also experienced a third consecutive season of cereal crop failure. As a result, households stocks are extremely low, leading to increased staple food prices and poor access to food for most of the poor households in these regions. (Sources: <i>The FSAU Post Deyr '05/06 Analysis, Technical Series Reports IV.8 Feb 2006; The FSAU Post Gu '06 Analysis, Technical Series Reports V.9 Sept. 2006</i>) • Therapeutic and supplementary feeding programs by MSFH in Marere, Jilib District on-going. (Source: <i>MSFH 2006: Monthly reports on Therapeutic and supplementary feeding programs</i>)	Very critical in Middle and Lower Juba (Source: <i>The FSAU Post Gu'06 Analysis, Technical Series Report V.9, September 15, 2006</i>)
Jan-June 2007	• FSAU Post Deyr '06/07 Analysis: - o A total of 110, 000 people in Humanitarian Emergency and 170,000 in Acute food and Livelihood Crisis. - o The humanitarian situation of the riverine populations in Juba Valley is critical and deteriorating due to the compounding impacts of the previous drought and severe flooding this season leading to total maize crop failure though some off season production is expected from March '07 onwards. Of the riverine population in the Juba Valley, 106,000 people are in a state of Humanitarian Emergency and 12,000 are in a state of Acute Food and Livelihood Crisis. Of these, in Middle Juba, 66,000 people are in Humanitarian Emergency and 5,000 in Acute Food and Livelihood Crisis and in Lower Juba, 40,000 people are in a state of Humanitarian Emergency and 7,000 in Acute Food and Livelihood Crisis. In the pastoral and agro pastoral areas, the food, livelihood and nutrition situation has improved since the Gu'06. Pastoral recovery continues due to the good rainfall of the Gu'06 and the exceptionally good rainfall of the Deyr 06/07. (Source: <i>The FSAU Post Deyr 06/07 Analysis, Technical Series Reports V.12 March 2007</i>) • Acute watery diarrhoea cases indicating a declining trend in South Central Somalia except for Middle Juba. Additionally, whereas Middle Juba reported 5% of all the cases for Jan-June 29th, 2007, the highest CFR of 7.16% was also reported here (Source: <i>WHO June 29th 2007 bulletin on Acute Watery Diarrhoea</i>) • Therapeutic and supplementary feeding programs by MSFH on-going in Marere, Jilib District (Source: <i>MSFH 2007, Monthly reports on Therapeutic and supplementary feeding programs</i>)	• FSAU Post Deyr 06/07 Integrated Nutrition Situation Analysis indicates a Critical in Middle and Lower Juba, and a Very Critical situation in the Riverine (Source: <i>The FSAU Post Deyr 06/07 Analysis, Technical Series Report V.12, March 7, 2007</i>) • FSAU led Nutrition Assessments in June 2007 - o M&L Juba Riverine: GAM of 15.4% (13.4-17.4) (WHZ < -2 or oedema) - o M&L Juba Pastorals: GAM of 13.4% (CI: 11.0-15.8) WHZ < -2 or oedema) - o Juba Agro-Pastorals: GAM of 10.2% (CI: 8.0-12.4) WHZ < -2 or oedema

2.0 ASSESSMENT OBJECTIVES

The overall objective of the three livelihood-based assessments was to establish the extent and severity of malnutrition, determine the causes of malnutrition and to monitor the trends of malnutrition in Middle and Lower Juba regions.

Specific Objectives were:

1. To estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months or with height/length of 65-109.9cm in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region.
2. To estimate the level of acute malnutrition among women aged 15-49 years in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region.
3. To identify factors influencing nutritional status of the children in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region.
4. To estimate the prevalence of some common diseases (measles, diarrhoea, febrile illnesses and ARI) in the three livelihood groups of Pastoral, Agropastoral and Riverine in Jubaregion.
5. To estimate the prevalence of malaria using Rapid Diagnostic Test for *Plasmodium falciparum* in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region
6. To estimate the measles and polio vaccination and Vitamin A supplementation coverage among children in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba regions.
7. To assess child feeding and care practices in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region.
8. To estimate the crude and under-five mortality rates in the three livelihood groups of Pastoral, Agropastoral and Riverine in Juba region.

3.0 METHODOLOGY

Three cross-sectional assessments were conducted among the Pastoral; Agropastoral and Riverine populations of in Middle and Lower Juba Regions covering across all the districts – Afmadow/ Hagar; Buale; Sako/Salagle; Jilib, Jamame, Badhadhe and Kismayo districts.

Two-stage cluster (30 by 30) sampling methodology was used to select 30 children aged 6-59 months and height/length of 65-109.9 cm from each of the 30 clusters in each livelihood. A list of all settlements/villages within each of the three assessed livelihoods in the regions with their respective populations¹⁰ formed a sampling frame and used to construct cumulative population figures for the assessment area from which 30 clusters were randomly drawn for each livelihood zone (*Appendix 4*). Retrospective mortality data was collected from 30 households in each cluster from each livelihood including even those that did not have children aged 6-59 months.

Both qualitative and quantitative data collection techniques were used. Quantitative data was collected through a standard household questionnaire for nutrition assessment (appendix 1a) and a standard mortality questionnaire (appendix 2). Quantitative data collected included household characteristics; child anthropometry, morbidity; vitamin A supplementation, measles and polio immunization coverage; dietary diversity; and water and sanitation. Qualitative data was collected by an interagency team comprising of assessment supervisors and coordinators through focus group discussions and key informant interviews to provide further understanding of possible factors influencing nutritional status.

A four-day training of enumerators and supervisors was conducted covering interview techniques, sampling procedure, inclusion and exclusion criteria, sources and reduction of errors, taking of measurements (height, weight and MUAC), standardisation of questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema and measles, verification of deaths within households, handling of equipment, and the general courtesy during the assessment.

Standardisation of measurement and pre-testing of the questionnaire and equipment were carried out in a village (Halgan) in the outskirts of Buale, not selected as a cluster for the actual assessment. Quality of data was also ensured through (i) monitoring of fieldwork by coordination team, (ii) crosschecking of filled questionnaires on daily basis and recording of observations and confirmation of measles, severe malnutrition and death cases by supervisors. All households sampled were visited and recorded including empty ones (iii) daily review was undertaken with the teams to address any difficulties encountered, (iv) progress evaluation was carried out according to the time schedule and progress reports shared with partners on regular basis, (v) continuous data cleaning and plausibility checks (vi) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights and (vii) continuous reinforcement of good practices. All measurements were loudly shouted by both the enumerators reading and recording them to reduce errors during recording.

Household and child data was entered, processed (including cleaning) and analysed using EPI6 software. Mortality data was entered and crude and under five mortality rates generated in Nutrisurvey software.

¹⁰ Due to lack of UNDP population figures at settlement level, NID polio figures (November 2007) further verified by the assessment team were used for sampling.

4.0 ASSESSMENT RESULTS

4.1 Household Characteristics of Study Population

The three livelihood-based nutrition assessments covered a total of 1379 households (452 from pastoral; 453 from agropastoral and 474 from riverine livelihoods) with mean household sizes of 6.3 ± 2.2 ; 5.7 ± 2.0 and 5.4 ± 1.8 persons respectively in the Pastoral; Agropastoral and Riverine livelihoods. A total of 2831 children (979 from pastoral, 952 from agropastoral and 900 from riverine livelihoods) aged 6-59 months and with height of 65-109.9 cm from were assessed with respective mean number of 2.2 ± 0.9 ; 2.1 ± 0.9 and 2.0 ± 0.8 under fives per household. The household characteristics by livelihood are presented in Table 4.1 below.

Table 4.1: Household Characteristics

Characteristics	Pastoral		Agropastoral		Riverine	
	N	%	N	%	N	%
Total Households	452	100	453	100	474	100
Household size (Mean):	6.3	SD=2.2	5.7	SD=2.0	5.4	1.8
Mean No of Under fives	2.2	SD=0.9	2.1	SD=0.9	2.0	SD=0.8
Sex of Household Head:						
Male	396	87.6	420	92.7	453	95.6
Female	56	12.4	33	7.3	21	4.4
Has Mosquito net:						
Yes	96	21.2	263	58.1	256	54.0
No	356	78.8	190	41.9	218	46.0
Type of Net:						
GFSOM	85	88.5	212	80.6	236	92.2
Other	8	8.3	49	18.6	16	6.3
Not seen	3	3.1	2	0.8	4	1.6
Main source of Income						
Animal and its products sales	319	70.6	112	24.7	66	13.9
Crop sales/Agriculture	-	-	230	50.8	378	79.7
Casual labour	104	23.0	79	17.4	29	6.1
Salaries/wages	21	4.6	8	1.8	1	0.2
Remittances	4	0.9	11	2.4	-	-
Trade/Fishing	2	0.4	3	0.7	-	-
Others/Destitute	2	0.4	10	2.2	-	-

The results showed that at least 87% of the assessed households were male-headed. Slightly over half of the assessed households in agropastoral and riverine populations had mosquito nets, most of which were distributed by the Global Fund Somalia programme. However, only 21% of the pastoral households owned mosquito nets.

The major source of income for the assessed households in the pastoral and

agropastoral livelihoods were sale of animal and animal products; and sale of crops/agriculture respectively as expected. Among the riverine livelihoods also, crop sales (79.7%) was the main source of income at the time of assessment (Table 4.1). Casual labour provided supplementary income in all the livelihoods. Deyr seasonal cultivation and off season cultivation (in the riverine) in the farms along the river beds and pump-irrigated farms, especially in Middle Juba provided casual labour to the poor households. Qualitative information showed that the riverine population had the weakest social support network and this could partly be explained by the lowest number (2.3%) of households receiving remittances.

4.2 Morbidity, immunization and Health Seeking Behaviour

High morbidity rates (from common child illnesses) were reported in the three livelihoods with more than half of the assessed children reportedly falling ill in two weeks (one month for measles) prior to the assessment in pastoral (54.3%); agropastoral (51.6%) and riverine (51.6%) populations of under five children.

For the children who fell sick within two weeks prior to the assessment, majority (>70%) sought medical assistance, mostly from public health facilities and private drug shops or clinics (Table 4.4). A significant proportion also sought the services of traditional doctors especially in pastoral (22%) population.

Table 4.4: Health seeking behaviour

	Pastoral		Agropastoral		Riverine	
<i>Child fell sick</i>	N	%	N	%	N	%
Yes	532	54.3	491	51.6	464	51.6
No	447	45.7	461	48.4	436	48.4
<i>Where health service sought</i>						
Public health facilities	130	24.4	171	34.8	203	43.8
Private pharmacy/clinic	91	17.1	137	27.9	63	13.6
Traditional healers	117	22.0	71	14.5	9	1.9
Own medication	87	16.4	41	8.4	51	11.0
No assistance sought	107	20.1	71	14.5	138	29.7

The incidence of reported diarrhoea in Pastoral, Agropastoral and Riverine populations (28.5%; 24.1% and 25.8% respectively) within two weeks prior to the assessment remained high. High incidences of ARI and febrile illnesses (suspected malaria) were also reported in the three livelihoods (Table 4.5). Results of rapid diagnostic test for *P. falciparum* show that malaria is endemic in Juba regions with rates of 14.5%; 13.6% and 16.4% reported in the assessed Pastoral, Agropastoral and Riverine populations. These levels were consistent with seasonal morbidity patterns recorded from the health facilities. There was no outbreak during the assessment unlike the last assessment when acute watery diarrhoea outbreak with a total of 3690 AWD cases¹¹ and 208 related deaths (Case Fatality rate of 5.6%) was reported in Juba regions by end of June 2007.

Table 4.5: Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

	Pastoral		Agropastoral		Riverine	
	n	%	n	%	n	%
<i>Incidence of major child illnesses</i>						
Proportion of children reported with diarrhoea in 2 weeks prior to assessment	279	28.5 (20.7-36.3)	229	24.1 (16.6-31.5)	232	25.8 (20.8-30.7)
Proportion of children reported with ARI within 2 weeks prior to assessment	307	31.4 (23.8-39.0)	265	27.8 (19.9-35.8)	256	28.4 (22.9-34.0)
Children reported with febrile illness in 2 weeks prior to assessment	240	24.5 (20.1-29.0)	216	22.7 (16.7-28.7)	197	21.9 (17.0-26.8)
Proportion of persons confirmed with malaria (RDT positive)	218	14.5 (N=1501) (9.3 – 19.7)	205	13.6 (N=1503) (10.2 – 17.1)	246	16.4 (N=1500) (10.4 – 22.4)
Children who slept under bed net	96	21.2 (17.6 – 25.4)	263	58.1 (53.4 – 62.6)	256	54.0 (49.4 – 58.5)
Suspected measles within one month prior to assessment	47	5.1 (3.6 – 6.6)	44	4.9 (3.4 – 6.4)	62	7.5 (5.0 – 10.1)
<i>Immunization Coverage (recall and card)</i>						
Children (9-59 months) immunised against measles	262	28.3 (19.0-37.7)	437	48.7 (33.3-64.0)	578	69.6 (62.2-77.1)
Children who have ever received polio vaccine	655	66.9 (58.2-75.6)	740	77.7 (71.7-83.8)	794	88.2 (83.1-93.4)
Children who received vitamin A supplementation in last 6 months	261	26.7 (17.5–35.8)	471	49.5 (34.8-64.2)	595	66.1 (57.6-74.6)

¹¹ WHO Acute watery diarrhoea update, 30th June 2007

Measles vaccination coverage for eligible children (9-59 months old) was still very low at only 28.3% as was coverage for vitamin A supplementation (26.7%) in the assessed pastoral population. Among the assessed children in agropastoral livelihood less than half had received vitamin A supplements (49.5%) and measles vaccine (48.7%) in the last six months. Coverage for the health programmes (including polio immunization) fell well below the recommended 95% level (Sphere, 2004) in all the three livelihoods.

4.3 Household Food Security

4.3.1 Food Consumption

As shown on figure 4.3.1, cereals provided the bulk of the food in the household diet. Cereal-based diets were consumed by all the assessed households. Other food items frequently consumed were milk, sugar and oil/fat. The riverine population had higher consumption of fruits (30.8%), vegetables (24.3%), pulses (22.4%) and fish (9.5%), while the pastoralists had considerably higher consumption of their staple food, milk (98.7%) as expected.

The riverine households grow and consume fruits (oranges, lemon, and mangoes) and vegetables (onions, tomatoes, pumpkins). Some families also get fish from the river. Consumption of other food groups (fruits, vegetables, eggs, roots and fish) were very low in the other livelihoods.

Fig 4.3.1 Distribution of Food Groups Consumed by Households

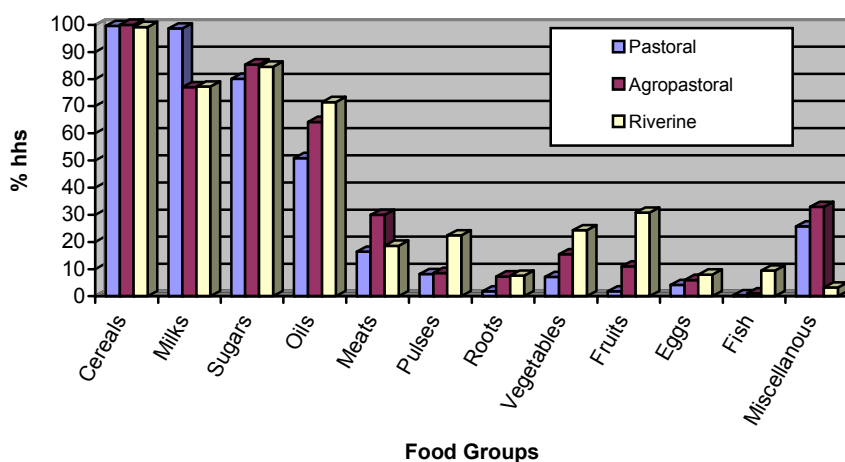


Table 4.7. Households main source of food						
	Pastoral		Agropastoral		Riverine	
Main source of food	n	%	n	%	n	%
Purchasing	342	75.7	197	43.5	222	46.8
Own production	83	18.4	144	31.8	210	44.3
Food aid	-	-	34	7.5	1	0.2
Gifts	3	0.7	42	9.3	3	0.6
Bartering	4	0.9	17	3.8	1	0.2
Borrowing	20	4.4	17	3.8	37	7.8
Gathering/wild	-	-	2	0.4	-	-
Main source of cereals	N=450		N=453		N=470	
Purchasing	435	96.7	255	56.3	152	32.3
Own production	-	-	183	40.4	318	67.7
Food aid	-	-	-	-	-	-
Gifts	4	0.9	-	-	-	-
Bartering	5	1.1	-	-	-	-
Borrowing	6	1.3	-	-	-	-
Main source of milk						
Purchasing	35	7.8	102	29.2	68	18.6
Own production	400	89.7	232	66.5	282	77.0
Gifts	4	0.9	15	4.3	3	0.8
Borrowing	7	1.6	-	-	13	3.6

Purchasing was the main households' source of food, mainly cereals, but a significant proportion also reported producing their own food (Table 4.7). Most of the milk consumed in the households was own production in majority (>65%) of households.

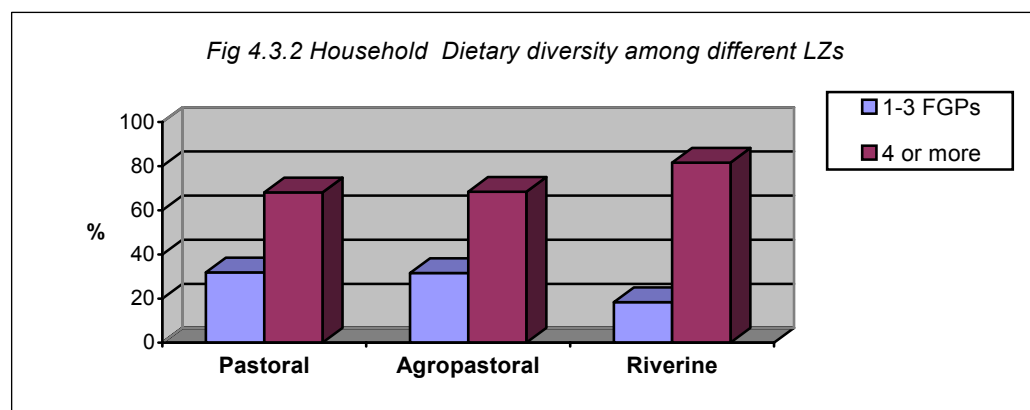
This was unlike in the previous year when most of the households surveyed obtained their food through purchasing or food aid. This is linked to the positive impacts of the *Gu '07* and *Deyr '07/08*

rains, which resulted in improved harvest and livestock recovery for most species due to improved pasture and seasonal cultivation. However, agropastoral and riverine livelihoods of Jamame and Kismayo which experienced failure of *Deyr '07/08* rains still have strained access to food and access their food through purchasing, food aid, gifts or borrowing.

4.3.2 Dietary Diversity

As reflected in the food consumption pattern, the riverine households consumed slightly more diversified diet (81.6%) with four food groups the most frequently consumed (reported in 39.7% of the households); mean dietary diversity score of 4.6 $\pm$ 1.5 in the previous 24 hours. Pastoral and agropastoral households consumed an average (HDDS) of 4.0 and 4.4 food groups respectively with the number of food groups consumed ranging from one to ten.

Table 4.8. Household Food Consumption and Dietary diversity						
	Pastoral		Agropastoral		Riverine	
	n	%	n	%	n	%
No of food groups consumed						
1 food group	4	0.9	-	-	-	-
2 food groups	61	13.5	59	13.0	30	6.3
3 food groups	79	17.5	84	18.5	57	12.0
4 food groups	205	45.4	136	30.0	188	39.7
5 food groups	67	14.8	84	18.5	93	19.6
6 food groups	11	2.4	30	6.6	66	13.9
7 food groups	9	2.0	6	1.3	16	3.4
8 food groups	7	1.5	53	11.7	14	3.0
9 food groups	7	1.5	1	0.2	5	1.1
10 food groups	2	0.4	-	-	3	0.6
11 food groups	-	-	-	-	2	0.4
No. Having Diversified Diet						
1-3 food groups	144	31.9	143	31.6	87	18.4
$\geq$ 4 food groups	308	68.1	310	68.4	387	81.6
Mean HDDS	4.0 (SD=1.4)		4.4 (SD=1.7)		4.6 (SD=1.5)	



As shown in Fig 4.3.2, overall, a critical proportion (18-32%) of the households consumed poor or less diversified diets¹² in the 24 hours prior to the assessment.

4.4 Nutrition Status

4.4.1 Malnutrition levels by Livelihoods

A total of 979 children, 49.4% boys and 50.6% girls aged 6-59 months were assessed from 452 households among the pastoral livelihoods. In the agropastoral livelihood, 952 children (50.8% boys and 49.2% girls) were assessed from 453 households while 900 children (50.1% of them boys and 49.9% girls) were assessed from 474 sampled households. The results shows **Serious** nutrition levels according to WHO classification with GAM rates of **14.1%** (CI: 11.3 – 16.9) and **14.7%** (CI: 10.9 – 18.5); and SAM rates of **2.2%** (CI: 1.3 – 3.2) and **2.6%** (CI: 1.4 – 3.9) respectively among the assessed pastoral and agropastoral populations. However the nutrition situation in riverine livelihood remains **Critical** with GAM rate of **13.7%** (CI: 10.0 – 17.3) and high SAM rate¹³ of **4.4%** (CI: 2.6 – 6.4). A summary of the findings for the acute malnutrition rates is given in table 4.10.

Table 4.10: Summary of Malnutrition rates by Livelihood systems

Malnutrition rates	Pastoral (N=979)		Agropastoral (N=952)		Riverine (N=900)	
	No	% (CI)	No	% (CI)	No	% (CI)
Global Acute Malnutrition (WHZ<-2 or oedema)	138	14.1 (11.3 - 16.9)	140	14.7 (10.9 - 18.5)	123	13.7 (10.0 - 17.3)
Severe Acute Malnutrition (WHZ<-3 or oedema)	22	2.2 (1.3 - 3.2)	25	2.6 (1.4 - 3.9)	40	4.4 (2.5 - 6.4)
Oedema	12	1.2 (0.6 - 1.9)	12	1.3 (0.5 - 2.0)	23	2.6 (1.1 - 4.0)
GAM estimates by WHO Anthro (2005) Standards:	147	15.0 (12.7 - 17.3)	153	16.1 (13.7 - 18.5)	132	14.7 (12.3 - 17.1)
SAM estimates by WHO Anthro (2005) Standards:	38	3.9 (2.6 - 5.1)	44	4.6 (3.2 - 6.0)	62	6.9 (5.2 - 8.6)
Global Acute Malnutrition (WHM<80% or oedema)	90	9.2 (6.7 - 11.6)	87	9.1 (6.2 - 12.1)	97	10.8 (7.4-14.1)
Severe Acute Malnutrition (WHM<70% or oedema)	14	1.4 (0.7 - 2.1)	13	1.4 (0.6 - 2.1)	27	3.0 (1.4 - 4.6)
Proportion of stunted children (HAZ<-2)	124	12.7 (8.9-16.4)	222	23.3 (16.8-29.8)	325	36.1 (31.6-40.6)
Proportion of underweight children (WAZ<-2)	190	19.4 (14.4-24.4)	309	32.5 (26.2-38.7)	295	32.8 (28.4-37.1)

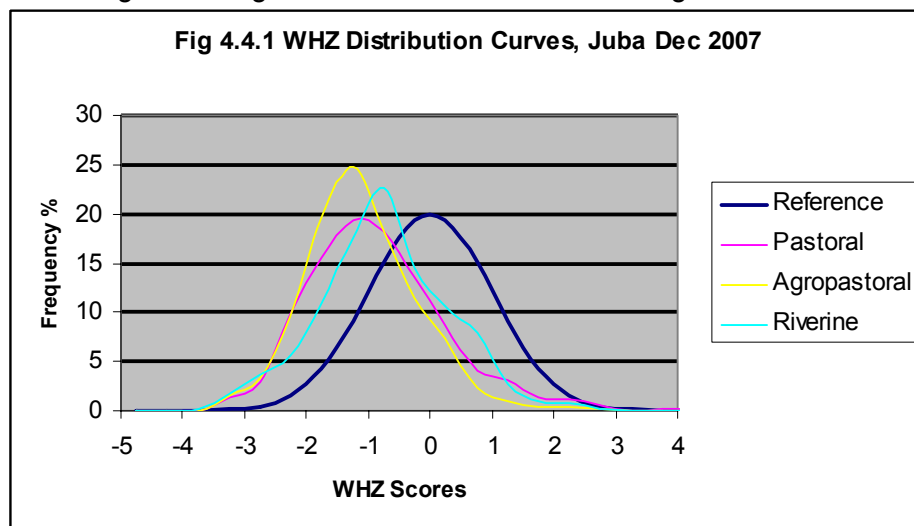
¹² Diversified diet is composed of at least four food groups based on a total of 12 FAO food groups.

¹³ Even though GAM levels are in serious category, the high SAM rates and associated risk factors, it is classified as critical.

When estimated using WHO Anthro (2005) Reference standards, slightly higher GAM rates and almost double SAM rates were reported. Pastoral livelihood reported GAM of **15.0%** (CI: 12.7 – 17.3) from **14.1%** (CI: 11.3 – 16.9) and SAM of **3.9%** (CI: 2.6 – 5.1) from **2.2%** (CI: 1.3 – 3.2), a relative increase of 6.4% and 77.3% respectively. Agropastoral livelihood assessment reported GAM of **16.1%** (CI: 13.7 – 18.5) from **14.7%** (CI: 10.9 – 18.5) and SAM of **4.6%** (CI: 3.2 – 6.0) from **2.6%** (CI: 1.4 – 3.9), a relative increase of 9.5% and 76.9% respectively; while among the riverine livelihood population a GAM of **14.7%** (12.3 – 17.1) and SAM of **6.9%** (CI: 5.2 – 8.6) were reported indicating 7.3% and 56.8% relative increase in GAM and SAM respectively.

Generally, the distributions of the weight-for-height scores in the three Juba regions assessments were skewed towards the left depicting a poorer nutrition situation according to international (WHO) standards (Fig 4.4.1). The mean WHZ for pastoral, agropastoral and riverine livelihoods were -0.87 (SD=1.11); -1.12 (SD=0.89) and -0.75 (SD=1.06) respectively.

A summary of the Nutrisurvey quality checks for the assessments is given in appendix 7.



4.4.2 Malnutrition by Sex in the three Livelihoods

Table 4.11 Distribution of children by nutritional status (WHZ-score or oedema) and child sex

Nutrition status	Pastoral				Agropastoral				Riverine			
	Males		Females		Males		Females		Males		Females	
	n	%	n	%	n	%	n	%	n	%	n	%
GAM (WHZ<-2 /oedema)	80	16.5	58	11.7	84	17.4	56	12.0	65	14.4	58	12.9
SAM (WHZ<-3 /oedema)	12	2.5	10	2.0	16	3.3	9	1.9	18	4.0	22	4.9
Oedema	8	1.7	4	0.8	7	1.4	5	1.1	13	2.9	10	2.2

For reasons that need further investigation, boys were more likely to be acutely malnourished (RR= 1.41; CI: 1.07 – 1.87; p=0.03 in pastoral and RR= 1.45; CI: 1.04 – 2.02; p=0.02 in agropastoral livelihoods) in the surveyed population using weight for height <-2 Z score or presence of oedema. However, results of acute malnutrition among the riverine livelihood did not show any statistical difference between the two sexes (p>0.05) even though a higher proportion of boys (14.4%) than girls (12.9%) were malnourished (Table 4.11). Furthermore, children from male-headed and female-headed households did not show any statistically significant difference in their risk to acute malnutrition.

4.4.3 Malnutrition by Age in the three Livelihoods

Table 4.12 Distribution of Acute Malnutrition (WHZ Scores) by Age

Age (months)	Pastoral		Agropastoral		Riverine	
	SAM	GAM	SAM	GAM	SAM	GAM
6-17	4 (2.0%)	28 (14.1%)	7 (3.4%)	29 (13.9%)	13 (5.5%)	56 (23.5%)
18-29	4 (1.8%)	26 (11.6%)	4 (1.9%)	32 (15.2%)	12 (5.7%)	30 (14.3%)
30-41	6 (2.7%)	31 (14.0%)	4 (1.9%)	23 (10.7%)	7 (3.6%)	16 (8.2%)
42-53	2 (1.1%)	24 (12.7%)	6 (3.4%)	33 (18.8%)	4 (2.6%)	10 (6.5%)
54-59	6 (4.1%)	29 (20.0%)	4 (2.8%)	23 (16.1%)	4 (3.9%)	11 (10.8%)
Total	22 (2.2%)	138 (14.1%)	25 (2.6%)	140 (14.7%)	40 (4.4%)	123 (13.7%)

Analysis of distribution of acute malnutrition between the different age groups showed that all the groups had equal risk of acute malnutrition. The breastfeeding age group 6-24 months and the 25-59 months category showed no statistical difference in acute malnutrition rates among them ($p>0.05$) in pastoral and agropastoral livelihoods. Equally there was no statistical difference ($p>0.05$) in acute malnutrition levels among the 6-29 months and 30-59 months age bands in the pastoral and agropastoral livelihoods. Among the riverine population, however, children aged 6-24 months old were more likely to be acutely malnourished ($RR=2.42$; $CI: 1.60 - 3.65$; $p<0.001$) than their older counterparts aged 25-59 months and those aged 6-29 months were also two times more likely to be acutely malnourished ($RR=2.35$; $CI: 1.65 - 3.33$; $p=0.000002$) than those aged 30-59 months. Previous qualitative studies and the recent KAPS¹⁴ study have reported poor child care including infant and young feeding practices in Somalia possibly explaining the high risk of acute malnutrition among the breastfeeding group.

4.4.4 Acute Malnutrition by MUAC

Table 4.13 Child and Maternal Malnutrition by MUAC

Malnutrition rates	Pastoral		Agropastoral		Riverine	
	No	% (CI)	No	% (CI)	No	% (CI)
Child MUAC	N= 879		N= 832		N=773	
GAM (MUAC< 12.5 cm or oedema)	50	5.7 (3.7 - 7.6)	61	7.3 (5.2 - 9.5)	65	8.4 (5.8 - 11.0)
SAM (MUAC< 11.0 cm or oedema)	12	1.4 (0.6 - 2.1)	4	0.5 (0.0 - 0.9)	11	1.4 (0.4 - 2.4)
Pregnant Women MUAC	N=93		N=100		N=135	
Total acutely malnourished (MUAC< 23.0 cm)	33	35.5	44	44.0	47	34.8
Severely malnourished (MUAC≤ 20.7 cm)	9	9.7	16	16.0	11	8.1
Non pregnant women MUAC	N=367		N=386		N=351	
Total acutely malnourished (MUAC≤ 18.5 cm)	3	0.8	3	0.8 (0.0 - 1.7)	3	0.9

¹⁴ Somali Knowledge, Attitude and Practices Study, FSAU December 2007.

Severely malnourished (MUAC< 16.0 cm)	1	0.3	1	0.3	2	0.6
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Based on MUAC measurements, acute malnutrition rates (MUAC< 12.5 cm or oedema) of 5.7% (CI: 3.7 – 7.6); 7.3% (CI: 5.2 – 9.5) and 8.4% (CI: 5.8 – 11.0) were reported in Pastoral; Agropastoral and Riverine livelihoods respectively (Table 4.13) indicating **Serious** malnutrition situation in pastoral and agropastoral areas and **Critical**¹⁵ situation in the riverine areas. The MUAC results though an underestimation, were consistent with weight –for-height estimates of malnutrition.

Among the assessed women; high acute malnutrition rates were recorded among the pregnant women (MUAC< 23.0 cm) ranging from 34.8% in Riverine to 44.0% in the agropastoral livelihood system. A high proportion of pregnant women were also severely (MUAC<20.7 cm) at risk of acute malnutrition as indicated in Table 4.13. Pregnancy raises physiological and nutritional demands of women making them vulnerable to acute malnutrition. Low acute malnutrition rates (<1%) were recorded among the non pregnant women.

¹⁵ According to the FSAU Nutrition Indicators and Categorization Table

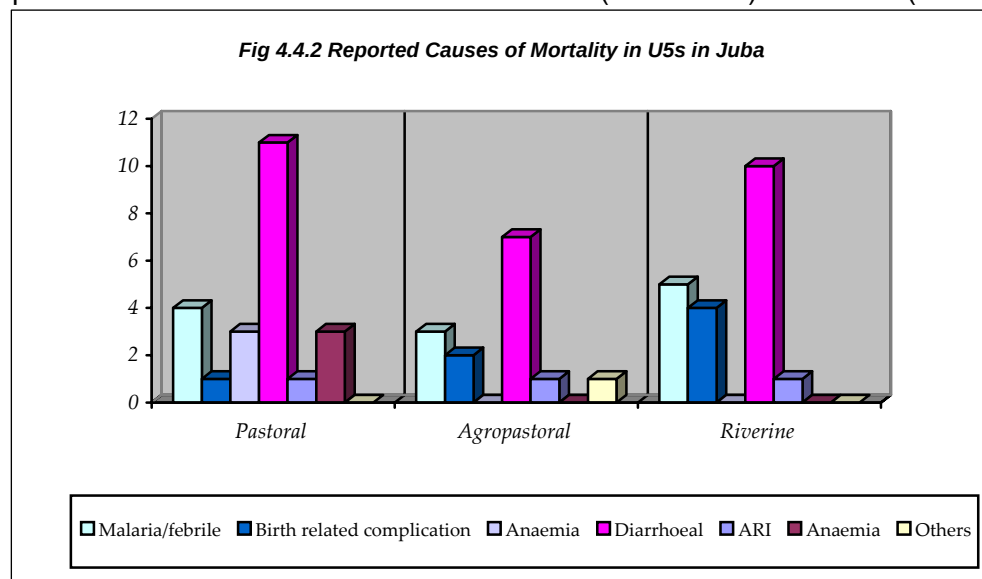
4.5 Mortality

A total of 14,153 persons, 4,030 of them under fives from 2,712 households were assessed for mortality in the three livelihood-based assessments. Out of these, a total of 166 deaths were reported, 96 of them children under five years of age.

Table 4.14 Mortality among the Pastoral, Agropastoral and riverine Lzs in Gedo

	<i>Pastoral</i>		<i>Agropastoral</i>		<i>Riverine</i>	
	U5	Total	U5	Total	U5	Total
Total HHs surveyed		906		901		905
Total Population assessed in HHs	1345	5035	1298	4678	1153	4318
Number who joined the HHs	27	217	10	42	2	86
Number who left the HHs	10	215	17	103	3	68
Number of births		417		65		27
Number of deaths	21	42	13	34	18	28
Mortality rate	1.76 (0.62–2.90)	0.93 (0.54 – 1.31)	1.13 (0.49 – 1.78)	0.80 (0.45 – 1.16)	1.74 (0.49 – 2.99)	0.72 (0.37 – 1.07)

The crude and U5 mortality rates were 0.93 (0.54-1.31) and 1.76 (0.62-2.90) respectively among the pastorals. CMR and U5MR rates of 1.13 (0.49 -1.78) and 0.80 (0.45 – 1.16) respectively were reported in the agropastoral livelihood. Among the riverine CMR of 0.72 (0.37 – 1.07) and U5MR of 1.74 (0.49-2.99) were reported (Table 4.14).



In all the instances, the CMR was in the 0.50-0.99 range while the U5MR was in the 1.00 – 1.99 range indicating **alert** situation according FSAU Nutrition categorization table and acceptable levels according to

WHO.

As shown on figure 4.4.2, diarrhoeal diseases, febrile illness, birth related complications (poor birth outcome) and ARI were the main reported factors associated with under-five mortality according respondents' recall.

Diarrhoea; malaria and birth related complications were also reported as the main causes of death among adults and children aged 5 years and above.

4.6 Qualitative Information

Information on food security, water & sanitation and childcare practices was collected through qualitative approaches. Semi-structured interviews with key informants and community focus groups were used for collecting the information. Proportional piling was used to identify livestock calving and kidding rate. The team also stopped randomly at settlements along the road for brief assessment, and ensured that rural communities and IDPs living outside the main villages were identified during the assessment. A separate assessment of the anticipated IDPs in Doblely did not take place since these populations were either on transit or integrated in the local community, therefore in the end did not warrant a detailed assessment.

The *Deyr* '07 rains started in time in most areas. The region received good amounts of rainfall, generally above average with Middle Juba recording 140-180% RFE and Lower Juba recording >300% RFE. Rainfall distribution was thus generally normal except riverine and agropastoral areas of Jamame and Kismayo that recorded below average rainfall causing crop failure (6% and 0% cereal production in Jamame and Kismayo respectively). Therefore, currently there is no water stress in the region, as most of the sources contain water except in these two districts. Most of the areas in Juba regions had access to water sources, mainly from open wells and river. The berkads are either full or partially filled. Overall, pasture condition is good and the livestock body condition is good for all species. There is increased herd size with medium livestock calving, lambing and kidding rates. Milk production is good for camels and cattle but average for goats. Availability and access of goat milk, camel milk, rice, sugar, and oil generally increased within the previous 3 months before the survey. Households reported that milk consumption has improved after the rains due to an increase in livestock productivity among the pastoral group. Access is however constrained by poor infrastructure in the region and especially among the riverine population by the normal livestock migration towards Afmadow and Kenyan border and away from the pest infested riverbanks.

Crop (cereal) production increased compared to *Gu* '07 production. Middle Juba had a total of 6960 MT cereal production (5880 MT of maize and 1080 MT of sorghum), 173% of PWA and 143% of *Deyr* 06/07 production. Middle Juba had the best cereal production after Gedo this *Deyr* '07/08 season. Lower Juba produced 560 MT (560 MT of sorghum and nil for maize) of cereals, 35% of PWA (1995-2007) cereal production. In addition some riverine and agropastoral households had maize and sorghum stocks while others also had other food items distributed by WFP as food aid especially in Sakow, Buale and Jilib. Despite the good production, cereal prices increased since July caused by influx of IDPs, low production in the previous *Gu* '07 season and high inflation rates caused partly by poor exchange rates. The prices of livestock are good and Terms of Trade (TOT) are favourable.

Besides reported high fuel costs, loss of irrigation pumps and spare parts, some of the canals that were destroyed by the floods during the *Gu* '07 season have not been rehabilitated yet. Common livestock diseases were reported especially in the pastoral livelihood group. Widespread charcoal burning and hunting of wild animals (*Goodir* and *Gesi*) were also common especially in Afmadow and Badhadhe areas.

Child feeding and child care practices remain largely suboptimal. Breastfeeding duration for children is usually 12 -18 months from birth. Water is often given to the newborn at birth. A sugary solution is given to the baby within the first week of birth while most children are given complementary food (animal milk – mostly goat milk) before they are one month old. For most children, semi solid foods are introduced as early as 3-4 months of age and solid foods like rice or *canjera* are introduced at the age of 8-12 months. Main foods given to infants (1 – 12 years) are goat milk 3 to 4 times a day in most cases and sometimes *canjero* or rice mixed with sugar and oil/butter and porridge (flour + sugar + oil). Food insecurity/hunger, close pregnancy intervals and sometimes ill health are the major constraints to breastfeeding of young children below two years. However cultural beliefs sometimes

also negatively affect breastfeeding. Lack of clean water, cooking & storage facilities and too much domestic work for women were mentioned as the main hindrances to food preparation and storage. Women have to travel long distances at times (during dry spells) or spend a lot of time away from home and do not have enough time to prepare food.

5.0 Discussion

The results shows a continuing **Serious** nutrition levels according to WHO classification with GAM rates of **14.1%** (CI: 11.3 – 16.9) and **14.7%** (CI: 10.9 – 18.5); and SAM rates of **2.2%** (CI: 1.3 – 3.2) including twelve (1.2%) oedema cases and **2.6%** (CI: 1.4 – 3.9) with twelve (1.3%) oedema cases respectively among the assessed pastoral and agropastoral populations. However the nutrition situation in riverine livelihood remains precarious and **Critical** with GAM rate of **13.7%** (CI: 10.0 – 17.3) and a **Critical** SAM rate of **4.4%** (CI: 2.5 – 6.4) including twenty three (2.6%) oedema cases and remains more vulnerable given the reliance on one main source of livelihood (crop production) which is prone to destruction by floods; poor health, water and sanitation services and poor social support network. The confidence interval ranges overlap in all the three studies, showing that there is no statistically significant difference in the rates of acute malnutrition between the three livelihood zones and from previous assessments conducted in June 2007 when a **GAM** rate of **13.4%** (11.0 – 15.8) and **SAM** rate of **1.3%** (0.5 – 2.1) in pastoral; **GAM** rate of **10.2%** (8.0 – 12.4) and **SAM** rate of **1.3%** (0.4 – 2.2) in agropastoral and **GAM** rate of **15.4%** (13.4 – 17.4) and **SAM** rate of **3.2%** (2.3 – 4.2) in riverine livelihoods were recorded respectively, indicating **Serious** nutrition situations in pastoral and agropastoral livelihoods and **Critical** nutrition situation in riverine population.

When estimated using WHO Anthro (2005) Reference standards, slightly higher GAM rates and almost double SAM rates than the NCHS (1977) Reference Estimates were reported. Pastoral livelihood reported GAM rate of **15.0%** (CI: 12.7 – 17.3) and SAM rate of **3.9%** (CI: 2.6 – 5.1), a relative increase of 6.4% and 77.3% respectively. Agropastoral livelihood assessment reported GAM rate of **16.1%** (CI: 13.7 – 18.5) SAM rate of **4.6%** (CI: 3.2 – 6.0), a relative increase of 9.5% and 76.9% respectively; while among the riverine livelihood population a GAM rate of **14.7%** (12.3 – 17.1) and SAM rate of **6.9%** (CI: 5.2 – 8.6) were reported indicating a 7.3% and 56.8% relative increase respectively.

The under five year mortality rates for the three assessments of **1.76** (0.62-2.90); **1.13** (0.49 -1.78) and **1.74** (0.49-2.99) in Pastoral; Agropastoral and Riverine respectively were below the emergency threshold of *2/10,000/day* and in the 1.00 – 1.99 range indicating **alert** situation according FSAU Nutrition categorization table and **acceptable** levels according to WHO. The Crude Mortality Rates of **0.93** (0.54-1.31); **0.80** (0.45 – 1.16) and **0.72** (0.37 – 1.07) in Pastoral, Agropastoral and Riverine respectively were in the 0.50-0.99 range, also below the emergency threshold of *1/10,000/day* levels, again indicating **alert** situation according FSAU Nutrition categorization table and **acceptable** levels according to WHO standards. Most of the reported deaths were associated with diarrhoea.

Overall, the assessment revealed a high level of morbidity in Juba regions where at least 51% of the assessed children had some form of illness in the two weeks prior to the assessment. The incidence of reported diarrhoea in Pastoral, Agropastoral and Riverine populations (28.5%; 24.1% and 25.8% respectively) within two weeks prior to the assessment remained high. High incidences of ARI and febrile illnesses (suspected malaria) were also reported in the three livelihoods. Rapid diagnostic test for *P. falciparum* show that malaria is endemic in juba valley with rates of 14.5%; 13.6% and 16.4% reported in the assessed Pastoral, Agropastoral and Riverine populations. These levels were consistent with seasonal morbidity patterns recorded from the health facilities. Morbidity has direct relationship with malnutrition where illness lead to increased nutritional demands to repair worn out tissues and at the same time interfering with the intake, digestion, absorption and utilization of the

nutrients in the body. Analysis continues to show strong significant association between acute malnutrition and morbidity rates. Children who had been ill within two weeks prior to the assessment, especially from diarrhoea were more likely to be acutely malnourished ($p < 0.05$).

Poor coverage for health programmes are important risk factors to poor nutrition situation in Juba region. Measles vaccination coverage for eligible children (9-59 months old) was still very low at only 28.3% as was coverage for vitamin A supplementation (26.7%) in the assessed pastoral population. Among the assessed children in agropastoral livelihood less than half had received vitamin A supplements (49.5%) and measles vaccine (48.7%) in the last six months. Coverage for the health programmes (including polio immunization) fell below the recommended 95% level (Sphere, 2004) in the three livelihoods. Past studies have associated these programmes, particularly vitamin A with improved immunity. In this assessment the children who had not received Vitamin A supplements were more likely to be acutely malnourished as compared to those who had received the supplements ($p < 0.05$).

The food security situation in Juba has been improving following good *Gu* '07, and the *Deyr* '07/08 seasons and households continue to benefit from good livestock body conditions for all species, high rates of calving, kidding and lambing; increased milk production; high livestock prices and favourable terms of trade. Juba received above average *Deyr* 07 rains which resulted into good harvests among the agropastoral and riverine populations. Middle Juba for instance recorded the second best cereal production this season (173%) after Gedo (291%) followed by Bakool (165%) compared to the PWA. In addition to improved cereal production, the riverine population are also benefiting from the availability of job opportunities in riverine areas, including fishing in the *Desheks*. Nevertheless, the riverine population in Lower Juba are still faced with **Humanitarian Emergency**. Areas of Kismayo and Jamame of Lower Juba experienced poor rainfall causing crop failure (L Juba had only 35% of PWA cereal production) in both riverine and agropastoral livelihoods. Except for the agropastoral and riverine areas of Lower Juba, which are classified to be faced with **Acute Food and Livelihood Crisis**, L & M Juba region is currently classified to be Generally Food Insecure and the situation is expected to remain stable.

The generally stable nutrition situation noted in Juba regions are associated with the positive impacts of the Post *Gu* '07 and *Deyr* 06/07 rains which have contributed to livestock recovery for most species (except cattle) and good crop production, in addition to increased access to humanitarian support. Despite the improvement in food security situation, the nutrition situation remains **Serious** in pastoral and agropastoral and **Critical** in riverine livelihood and has not indicated any significant change over the past six months (since Post *Gu* '07).

Insecurity, unemployment, stressed livelihoods, poor child feeding and poor access to health services remain the main underlying causes of acute malnutrition in Juba regions. Juba has experienced sporadic armed conflict for over 10 years with devastating effects on education, labour, food security and economic development in the region. Feeding practices for children are persistently poor, preventable diseases are prevalent and access to maternal and child care is suboptimal in the region. Exclusive breastfeeding for the first six months of life, introduction of appropriate complimentary food at six month of age and persistence in breastfeeding for up to 24 months is associated with proper growth and development and reduced risks of morbidity. Poor dietary diversity; reported high rates of morbidity, poor feeding and care practices aggravate the nutrition situation in these regions. Almost one third of the assessed households were reported to have consumed less diversified diet (fewer than four food groups) in the previous 24 hours. Even though this study and past assessments do not show a significant association between acute malnutrition and dietary diversity in Somalia, reduced food intake is an immediate cause of acute malnutrition, and so acute malnutrition may be attributed to a combination of other intervening factors such as high morbidity, poor child feeding, and poor sanitation that negatively influences nutrition status.

Intervention efforts that address both immediate life saving needs especially for the severe malnutrition cases in addition to developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms are recommended.

6.0 Recommendations

In spite of evidence of significant recovery in the food security situation, integrated nutrition analysis continue to highlight that **the rates of acute malnutrition in Juba have still remained at unacceptably serious and critical levels**. Intervention efforts, therefore, need to be strengthened and broadened to address both immediate life saving needs in addition to developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms. Specific recommendations include:

Immediate Interventions

- Improving coverage for health programmes, especially for measles vaccination and vitamin A supplementation. Vigorous campaigns are required in Juba regions especially among the pastoral community.
- Rehabilitation of acutely malnourished children through selective feeding programs until household food security is restored and critical public health issues are addressed. All options to address this through effective and non-damaging measures need to be considered. Capacity building of the existing Health Facility and the community to manage acutely malnourished children could be explored.
- There is need to focus on programmes that improve and sustain dietary diversity and consumption of micronutrient rich foods.
- There is need to have intervention to control flooding by the riverbanks
- Intervention programmes on water, sanitation and hygiene practices including health education
- Addressing the high rates of malnutrition in pregnant and lactating women.

Long term Interventions

- There is a need for rehabilitation/protection of water systems including the well and water catchments (such as capping of wells) in anticipation of seasonal flooding. The community should be trained on sanitation of the water systems
- Provision of large water containers for fetching and storage of water would contribute in easing water problems where people have to cover long distance to get water and yet they are unable to carry large volume of water.
- To initiate income generating activities to improve the socio-economic situation in Juba regions. Introduction of small-scale credit system for small business would help improve livelihoods especially among the riverine community.
- There is need for establishment or strengthening of health facilities and satellite services especially in rural villages where there are no health facilities
- Intensifying health and nutrition education activities at the household level to address care concerns, targeting mothers, and other caregivers. The main areas of focus should include promoting exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvements in household hygiene including health care practices.
- Canal rehabilitations, provision irrigations pumps, fuel for irrigation and spare parts to the Riverine communities in Juba Valley
- Establish mobile veterinary team to cater for livestock health especially in the pastoral livelihood group.

Appendix 1. Juba Nutrition Assessment Household Questionnaire, June 2007

Household Number _____ Date _____ Team Number _____ Cluster Number _____ Cluster Name _____ District: _____

Q1-8 Characteristics of Household**Q1.** Household size¹⁶ ? _____**Q2.** Number of children less than 5 years (0-59 months)? _____**Q3.** Sex of household head¹⁷? 1=Male 2=Female**Q4a.** Does household have mosquito net? _____ 1= Yes 0= No **Q4b.** If yes, ask to see the net: _____ 1= GFSOM label 2=Other type 3= Not seen**Q5.** What is the household's main source of income? 1= Animal & animal product sales 2= Crop sales 3= Trade 4= Casual labour
5= Salaried/wage employment 6= Remittances/gifts/zakat 7= Others, specify _____**Q6-14 Feeding and immunization status of children aged 6 – 59 months (or 65 – 109.9 cm) in the household.**

First Name	Q6 Age (months) <i>(if child is more than 24 months old, skip to Q12)</i>	Q7 <i>(If 6-24 months)</i> Are breastfeeding ¹⁸ you the child? <i>(if no, skip to Q9)</i> 1=Yes 0= No	Q8 <i>(If 6-24 months)</i> If breast feeding, how many times/day? 1=2 times or less 2=3-6 3=On demand	Q9 <i>(If 6-24 months)</i> If not breast feeding, how old was the child when you stopped breast-feeding? 1= less than 6 months 2=6-11 months 3=12 – 18 months 4=≥18 months 5= Never breastfed	Q10 <i>(If 6-24 months)</i> At what age was child given water/ foods other than breast milk? 1=0-3 months 2=4-5 months 3=6 months 4=7 months or more.	Q11 <i>(If 6-24 months)</i> How many times do you feed the child in a day <i>(besides breast milk)</i> ? 1= 1-4 times 2= 5 or more times	Q 12 Has child been provided with Vitamin A in the last 6 months? <i>(show sample)</i> 1=Yes 0= No	Q13 <i>(If ≥9 months old)</i> Has child been Vaccinated against measles in the last 6 months? 1=Yes 0= No	Q14 Has the child ever been given polio vaccine orally? 1=Yes 0= No
1									
2									
3									
4									

¹⁶ Number of persons who live together and eat from the same pot at the time of assessment¹⁷ One who controls and makes key decisions on household resources (livestock, assets, income, and food), health and social matters for and on behalf of the household members.¹⁸ Child having received breast milk either directly from the mothers or wet nurse breast within the last 12 hours

Q15-25 Anthropometry and morbidity for children aged 6 – 59 months or (65 – 109.9cm) in the household

First Name <i>Follow same order as per table on page 1</i>	Q15 Child Sex 1=Male 2=Female	Q16 Oedema 1=yes 0= No	Q17 Height (cm)	Q18 Weight (kg)	Q19 MUAC (cm)	Q20 Diarrhoea ¹⁹ in last two weeks 1= Yes 0= No	Q21 Serious ARI ²⁰ in the last two weeks 1=Yes 0= No	Q22 Febrile illness/suspected Malaria ²¹ in the last two weeks 1=Yes 0= No	Q23 (If ≥9 month) Suspected Measles ²² in last one month 1=Yes 0= No	Q24 Did child sleep under a mosquito net last night? 1=Yes 0= No	Q25 Where did you seek healthcare assistance when child was sick? (If yes in Q20 – 23) 1=No assistance sought 2=Own medication 3=Traditional healer 4=Private clinic/Pharmacy 5= Public health facility
1											
2											
3											
4											

26: Anthropometry (MUAC) for adult women of childbearing age (15-49 years) present at the household

Sno	Name	Age (years)	MUAC (cm)	Physiological status 1=Pregnant 2= Non pregnant	Illness in last 14 days? If yes, what illness?
1	Mother:				
2					
3					

Codes for adult illnesses

0= None	1= ARI
2=Diarrhoeal	3=Malaria/febrile
4=Joint	5=Urinal
6=Organ	7=Anaemia
8= Reproductive	9=Other, specify

¹⁹ Diarrhoea is defined for a child having three or more loose or watery stools per day²⁰ ARI asked as oof wareen or wareento. The three signs asked for are cough, rapid breathing and fever²¹ Suspected malaria/acute febrile illness: - the three signs to be looked for are periodic chills/shivering, fever, sweating and sometimes a coma²² Measles (Jadeeco): a child with more than three of these signs– fever and, skin rash, runny nose or red eyes, and/or mouth infection, or chest infection

Q 27 Food Consumption & Dietary Diversity

Twenty four-hour recall for food consumption in the households: The interviewers should establish whether the previous day and night was usual or normal for the households. If unusual- feasts, funerals or most members absent, then another day should be selected.

Food group consumed: What foods groups did members of the household consume in the past 24 hours (from this time yesterday to now)? Include any snacks consumed.	Did a member of your household consume food from any these food groups in the last 24 hours? 1=Yes 0= No	*Codes: 1= Own production 6=Borrowed 2=Purchases 7=Gathering/wild 3=Gifts from friends/ relativeses 8=Others, specify____ 4=Food aid 9=N/A 5=Bartered
Type of food		What is the main source of the dominant food item consumed? (Use codes above)?
1. Cereals and cereal products (e.g. maize, spaghetti, rice, caanjera, bread)?		
2. Milk and milk products (e.g. goat/camel/ fermented milk, milk powder)?		
3. Sugar and honey?		
4. Oils/fats (e.g. cooking fat or oil, butter, ghee, margarine)?		
5. Meat, poultry, offal (e.g. goat/camel meat, beef, chicken or their products)?		
6. Pulses/legumes, nuts (e.g. beans, lentils, green grams, cowpeas; peanut)?		
7. Roots and tubers (e.g. potatoes, arrowroot)?		
8. Vegetables (e.g. green or leafy vegetables, tomatoes, carrots, onions)?		
9. Fruits (e.g. water melons, mangoes, grapes, bananas, lemon)?		
10. Eggs?		
11. Fish and sea foods (e.g. fried/boiled/roasted fish, lobsters)?		
12. Miscellaneous (e.g. spices, chocolates, sweets, beverages, etc)?		

Q28 In general what is the main source of staple food in the household? (*Use codes in 27 above) _____

Q29 Total number of food groups consumed in the household: _____

Q30 How many meals²³ has the household had in the last 24 hours (from this time yesterday to now)? 1= One 2=Two 3= Three

Checked by supervisor (signed): _____

²³ A meal refers to food served and eaten at one time (excluding snacks) and includes one of the three commonly known: - breakfast, lunch and supper/dinner

Appendix 2: Juba Valley Mortality Questionnaire, June 2007

Household No: _____ Date: _____ Team No: _____ Cluster No: _____ Enumerator's Name: _____

[illegible]

Codes

Reason for migration

- 1= Civil Insecurity 6= Hospitalised
2= Food Insecurity 7= In boarding school
3= Employment 8= Grazing/herding
4=Divorce/ Married away 9= Other, specify
5=Visiting

Cause of death

- 1= Diarrhoeal diseases
2= ARI
3= Measles
4= Malaria
5= STD/ HIV/AIDS
6= Anaemia
7= Birth complications
8= Accident/ killed/ physical injuries
9= Hunger/starvation
10= Other, specify

Summary*

	Total	U5
Current HH Members		
Arrivals during the Recall period		
Number who have left during Recall period		
Births during recall		
Deaths during recall period		

* For Supervisor Only

APPENDIX 3: TRADITIONAL CALENDAR

Month	Events	2003	2004	2005	2006	2007
Jan.	Beginning of Jiilal	59 Siditaal	47 Siditaal	35 Siditaal Safari park retreat	23 Siditaal	11 Carafu
Feb.	Mid of Jiilaal	58 Arafo/Dul-Xaj	46 Arafo/Dul-Xaj Sakow market burnt	34 Arafo/Dulxaj	22 Arafo/Dulxaj Sheikh Indhocaadde-Baidoa attack	10 Sakow
Mar.	End of Jiilaal	57 Sako	45 Sako	33 Sako	21 Sako/Safar Sheikh Ibrahim Bardera ceremony	9 Safar
Apr.	Beginning of Gu'	56 Safar	36 Safar	32 Safar Riverine floods	20 Safar/Mawliid	8 Mawliid Rabicul Awal
May	Mid of Gu'	55 Mawliid Iraq War	43 Mawliid	31 Mawliid	19 Mawliid/Jamadul-awal.	7 Rabicul Awal Malmadone
Jun.	End of Gu'	54 Malmadoone / Milihore	42 Malmadoone/ Milihore	30 Malmadoone/ Milihore	18 Malmadoone/ Milihore/Jamadul-awal	6 Jamaatul Awal
July	Beginning of Xagaa	53 Jamadul-Awal Death of General Gabyoo	41 Jamadul-Awal/	29 Jamadul-Awal/	17 Jamadul-Awal/	5 Jamaatul Akhir
Aug.	Mid of Xagaa	52 Jamadul-Akhir/	40 Jamadul-Akhir/	28 Jamadul-Akhir/	16 Jamadul-Akhir/	4 Rajab
Sep.	End of Xagaa	51 Rajab/Shacbaan	39 Rajab/Shacbaan World Vision moved from Buale reconciliation	27 Rajab/Shacbaan	15 Rajab/Shacbaan	3 Shacbaan
Oct.	Beginning of Deyr	50 Shacbaan Death of former Buale DC	38 Shacbaan/ Ramadan Election of president A. Yusuf in Kenya.	26 Shacbaan/ Ramadan 1 st food distribution by WV	14 Ramadan	2 Soon
Nov.	Mid of Deyr	49 Soon (Ramadhan)	37 Soon (Ramadhan)	25 Soon (Ramadhan)	13 Soonfur	1 Sonfur
Dec.	End of Deyr	48 Soonfur	36 Soonfur	24 Soonfur	12 Sidatal	

Appendix 4: Clusters Sampling for L & M Juba December 2007 Assessment

District	Village	Est. Population	Livelihood	Cluster No
Salagle	Buulahar	460	PASTORAL	1
Sakow	Towsi	435	PASTORAL	2
Sakow	B/gaduud	565	PASTORAL	3
Buale	Arabow	1100	PASTORAL	4
Buale	Buulagalool	575	PASTORAL	5
Buale	Warahadhobley	650	PASTORAL	6
Afmadow	Afmadow	12500	PASTORAL	7;8;9;10;11;12
Afmadow	Qaysangur	400	PASTORAL	13
Afmadow	Aw magan	470	PASTORAL	14
Afmadow	Qoqani	1200	PASTORAL	15
Afmadow	Tabta	1600	PASTORAL	16
Afmadow	Dobley	16000	PASTORAL	17;18;19;20;21;22;23;24
Afmadow	Diif	2000	PASTORAL	25
Kismayo	Bulo qoqan	300	PASTORAL	26
Kismayo	Canjeel	1500	PASTORAL	27
Kismayo	Gurmadka	360	PASTORAL	28
Badhaadhe	Galmo hajile	670	PASTORAL	29
Badhaadhe	Bulo qoqan	500	PASTORAL	30
Salagle	Salagle	6525	Agropastoral	31; 32
Salagle	Aroosura	705	Agropastoral	33
Salagle	Buulo yuub	485	Agropastoral	34
Salagle	B/Qansax 3	705	Agropastoral	35
Salagle	dhumey	455	Agropastoral	36
Sakow	SAKOW	10500	Agropastoral	37,38,39
Sakow	Nebsooy	750	Agropastoral	40
Sakow	Gumarey	175	Agropastoral	41
Sakow	Caleyow Kerrow	600	Agropastoral	42
Sakow	Daggaras	325	Agropastoral	43
Sakow	B/qansax2	235	Agropastoral	44
Hagar	Hagar town	3680	Agropastoral	45
Hagar	Hussen bare	200	Agropastoral	46
Jilib west	Hargaisa	4000	Agropastoral	47
Jilib west	Gududei	5540	Agropastoral	48,49
Jamame	Kamsuuma	2000	Agropastoral	50
Jamame	Belet amiin	2262	Agropastoral	51
Jamame	Turdho	1250	Agropastoral	52
Jamame	Cadaad geri	550	Agropastoral	53
Jamame	Baarka	1300	Agropastoral	54
Kismayu	Bulo Gaduud	2220	Agropastoral	55

Kismayu	Bulo Haji	8422	Agropastoral	56,57
Badhdadhe	Lugato	660	Agropastoral	58
Badhdadhe	Odooy	1300	Agropastoral	59
Badhdadhe	Kaamboni	3000	Agropastoral	60
Salagle	Hoogbalango	925	Riverine	61
Sakow	I/bari	550	Riverine	62
Sakow	Kuraawo	500	Riverine	63
Bualle	BU'AALE	7500	Riverine	64
Bualle	Gola	310	Riverine	65
Bualle	Afgooy+IDPs	455	Riverine	66
Bualle	Banta+Nomadic	770	Riverine	67
Bualle	Caanoole	900	Riverine	68
Jilib West	Mareri	5650	Riverine	69,70
Jilib West	B/shidad	360	Riverine	71
Jilib West	Gumeni wein	1200	Riverine	72
Jilib East	JILLIB Town	11520	Riverine	73,74,75
Jilib East	Tarbaa dhoble	555	Riverine	76
Jilib East	Malenda +nomadic	1245	Riverine	77
Jilib East	Cusmaan Mooto	1920	Riverine	78
Jilib East	Helashiid	625	Riverine	79
Jilib East	Madhooka	670	Riverine	80
Jilib East	Mansuur yare	320	Riverine	81
Jilib East	Kamdaada	810	Riverine	82
Jamaaame	Yiireey	795	Riverine	83
Jamaaame	Kawan	3000	Riverine	84
Jamaaame	Beledraxmo	1740	Riverine	85
Jamaaame	Korkaamarey	780	Riverine	86
Jamaaame	Buula yaaq	740	Riverine	87
Jamaaame	Buula isaaq	900	Riverine	88
Jamaaame	Makalaangoo	2200	Riverine	89
Jamaaame	Barka dhuroo	900	Riverine	90

Appendix 4b. Juba Assessment Team – Dec 2007

Team	Names		Agency	Responsibility	Area Surveyed
1	1	Abdi Sheikh Noor Gaal	CARE, Marka	Supervisor	Adale; Balcad; Adan Yabal
	2	Abdulkadir Hashi Ayanle	CARE, Mogadishu	Team leder	Adale; Balcad; Adan Yabal
	3	Maryan Nuur Jimcale	INTERSOS, Jowhar	RDT Nurse	Adale; Balcad; Adan Yabal
	4	Mohamed Abdirizak Hussein	Community, Jowhar	Enumerator	Adale; Balcad; Adan Yabal
	5	Mohamed Bare Mohamud	Community, Jowhar	Enumerator	Adale; Balcad; Adan Yabal
2	1	Nuur Olow Mohamed	TRG, Jowhar	Supervisor	Jowhar
	2	Salat Ismail Aden	WFP, Wajid	Team leder	Jowhar
	3	Saciido Ceynte Sharey	INTERSOS, Jowhar	RDT Nurse	Jowhar
	4	Haawo Mohamed Mohamud	SRSC, Jowhar	Enumerator	Jowhar
	5	Salah Hussein Hurshow	Community, Jowhar	Enumerator	Jowhar
3	1	Hussein Mohamed Abdulle	SRSC, Jowhar	Supervisor	Jowhar; Mahaday
	2	Sheikh Isse Hussein	SACOD, Marka	Team leder	Jowhar; Mahaday
	3	Kinsi Farah Mohamed	HEEGAN, Brava	RDT Nurse	Jowhar; Mahaday
	4			Enumerator	Jowhar; Mahaday
	5			Enumerator	Jowhar; Mahaday
4	1	Sahra Mohamed Omar	INTERSOS, Jowhar	Supervisor	Afgoye; Hawa Abdi
	2	Mohamed Nuur Elmi	DAQAMASOM, Mog	Team Leader	Afgoye; Hawa Abdi
	3	Mulki Nuur Warsame	HEEGAN, Marka	RDT Nurse	Afgoye; Hawa Abdi
	4	Yusuf Mohamed Hagi	Community, Marka	Enumerator	Afgoye; Hawa Abdi
	5	Abdulkadir Ahmed Hassan	SACOD, Marka	Enumerator	Afgoye; Hawa Abdi
5	1	Sahra Moalim Mohamed	Community, Marka	Supervisor	Afgoye; Elasha
	2	Mohamed Ali Lankey	SRCS; Marka	Team leder	Afgoye; Elasha
	3	Abdi Shakur Sheikh	New ways; Marka	RDT Nurse	Afgoye; Elasha
	4	Ilyas Mohamed Sharif	SACOD, Marka	Enumerator	Afgoye; Elasha
	5	Abdullahi Abdi Sheikh	SRCS; Marka	Enumerator	Afgoye; Elasha
6	1	Asha Hushein Moalim	Zam Zam Foundation	Supervisor	Afgoye; Elasha
	2	Osman Moalim Mohamed	Zam Zam Foundation	Team leder	Afgoye; Elasha
	3	Kaltuma Osman Mohamed	HEEGAN, Marka	RDT Nurse	Afgoye; Elasha
	4	Adam Sheikh Mohamed	SACOD, Marka	Enumerator	Afgoye; Elasha
	5	Farhiyo Abdullahi Isse	SRCS; Marka	Enumerator	Afgoye; Elasha
7	1	Mohamed Mohamud Mohamed	COSV, Marka	Supervisor	Marka
	2	Shukri Sharif Mohamed	COSV, Marka	Team leder	Marka
	3	Haawo Hassan Jama	HEEGAN, K50	RDT Nurse	Marka
	4	Ali Nuur Ali	COSV, Barire/Marka	Enumerator	Marka
	5	Ralia Omar Moalim	SACOD, Marka	Enumerator	Marka
8	1	Ibrahim Mohamed	FSAN, Kismayo	Supervisor	Marka

	2	Saciid Hagaa Afrah	TRG, Jowhar	Team leder	Marka
	3	Fardowsa Farah Ahmed	COSV, Marka	RDT Nurse	Marka
	4	Yasin Abdulahi Yasin	Community; Marka	Enumerator	Marka
	5	Bashir Ibrahim Hiban	Community; Afgoye	Enumerator	Marka
9	1	Ali Mohamed Moalim (Black)	WFP, Wajid	Supervisor	Qoryoley; Kurtunwarey; Sablaale
	2	Ismail Salat Dhore	SACOD, Marka	Team leder	Qoryoley; Kurtunwarey; Sablaale
	3	Maryan Dahir Halane	COSV, Qoryoley	RDT Nurse	Qoryoley; Kurtunwarey; Sablaale
	4	Fadumo Mohamed Adani	SRCS; Marka	Enumerator	Qoryoley; Kurtunwarey; Sablaale
	5	Salat Aweys Mohamed	SACOD, Marka	Enumerator	Qoryoley; Kurtunwarey; Sablaale
10	46	Mohamed A. Ibrahim (Atom)	UNICEF, Mogadishu	Supervisor	Walanwein; Marka IDPs
	47	Farhiyo Abdirahim Abukar	DAMAQSOM, Mogadishu	Team Leader	Walanwein, Marka IDPs
	48	Fadumo Ali Diini	HEEGAN,	RDT Nurse	Walanwein, Marka IDPs
	49	Hassan Isak Nuuh	COSV, K50	Enumerator	Walanwein; Marka IDPs
	50	Sheikh Ali Mohamed	SACOD, Marka	Enumerator	Walanwein; Marka IDPs
	1	Tom Oguta	FSAU, Nairobi	Coordinator	All
	2	Mohamed Borle	FSAU, Nairobi	Coordinator	All
	3	Nura Gureh	FSAU, Nairobi	Coordinator	All
	4	Grainne moloney	FSAU, Nairobi	Manager	All

APPENDIX 5: REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date: _____

Name of the child: _____ Sex of child: _____

Age of child: _____ Name of caretaker: _____

Child diagnosed (suspected) with (state the condition): _____

Child referred to: _____

Child referred by: _____

SOMALIA - ESTIMATED NUTRITION SITUATION (JULY 2007)

LEGEND

Nutrition Situation

- Insufficient Data
- Insufficient data but likely to be critical
- Alert
- Serious
- Critical
- Very Critical
- IDP Concentration Areas

Projected Trend (July-Dec'07)

- Potential to Improve
- Uncertain
- Potential to Deteriorate

Map Details:

- Geography:** Gulf of Aden, Indian Ocean, Ethiopia, Kenya, Djibouti.
- Regions:** Awdal, Woqooyi Galbeed, Togdheer, Sool, Sanag, Bari, Gardo, Nugal, Mudug, Gaigadud, Hirshabelle, Shabelle, Jubbada Aduha, Jubbada Dhaqqa, Bakool, Gedo, M. Juba, L. Juba, Kismayo, Badkade.
- Cities:** Zeylao, Ugaire, Berbera, Siyid, El Aduha, Erigauo, Badkade, Bosaso, Kismayo, Baidoa, Mogadishu, Jubbada Aduha, Jubbada Dhaqqa, Bakool, Gedo, M. Juba, L. Juba, Kismayo, Badkade.
- Scale:** 0 to 100 Kilometers.
- Source:** FSU, 2007; Admin. 1976; UNDP, 1998.
- Updated:** July, 2007.

Appendix 7. Assessments Quality checks

		Pastoral	Agropastoral	Riverine	Reference
No of flags (%)		0.8	0.2	0	-
Mean of WHZ		-0.87	-1.12	-0.75	-
Digit preference	Weight	No	No	No	No
	Height	5	No	No	No
SD of WHZ		1.1	0.89	1.06	-0.85 to 1.1
Skewness of WHZ		0.648	0.501	0.069	-1 to 1
Kurtosis of WHZ		0.689	0.956	0.217	-1 to 1
Representativeness of sample	Age group	No bias	No bias	No bias	No bias
	Age clumping	25; 49 and 59	36 and 59	36; 48 and 59	None
	Sex ratio	1.0	1.0	1.0	0.8 to 1.2

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