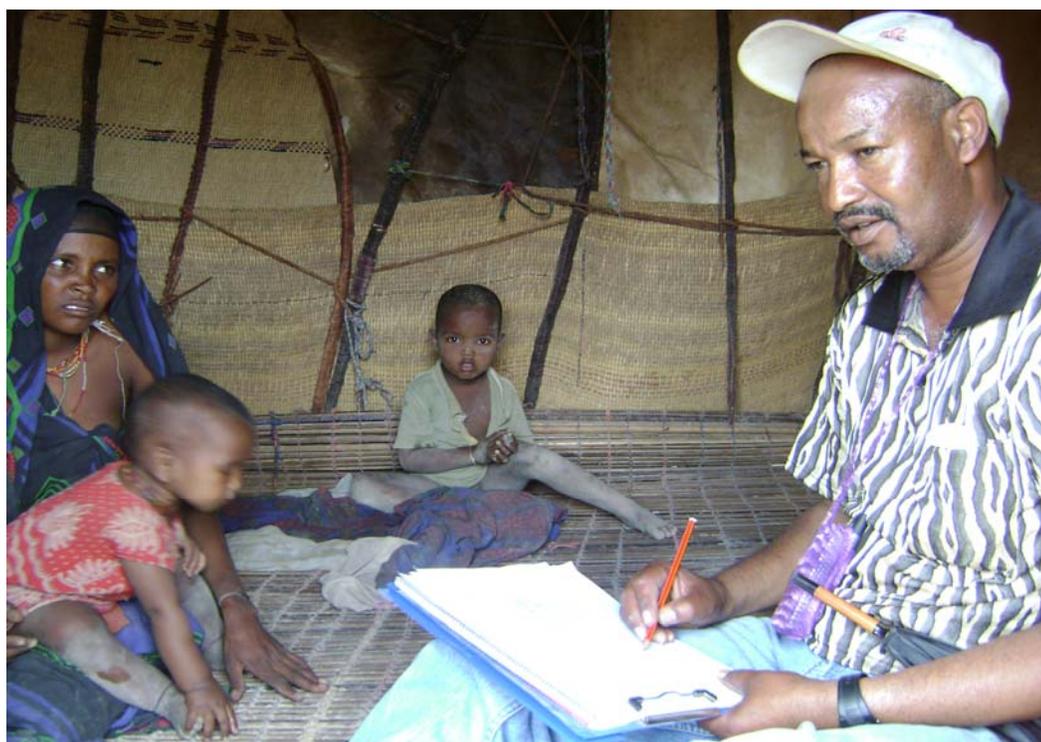# NUTRITION ASSESSMENT REPORT

BAKOOL AGROPASTORAL LIVELIHOOD ZONE

BAKOOL REGION, SOMALIA

Food Security Analysis Unit (FSAU/FAO)
United Nations Children Fund
World Vision International/WVI
International Medical Corps/ IMC
World Food Programme/WFP

July, 2008

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Acknowledgement

The Nutrition Surveillance Project of the Food Security Analysis Unit (FSAU), and International Medical Corps (IMC) acknowledge the participation of UNICEF, World Vision International (WVI), World Food Program (WFP), Green Hope and Somalia Red Crescent Society (SRCS), in the Bakool Agropastoral livelihood system. FSAU provided technical support including the assessment coordinators and supervisors and financed the cost of transport, supervisors, nurses, team leaders, enumerators and data entry clerks. WVI and IMC provided logistical support and partly financed the cost of transport, supervisors, nurses, team leaders and enumerators for Bakool agropastoral nutrition assessment.

Special thanks goes to the mothers, caregivers, leaders and the community as a whole in Bakool Region for their cooperation, time and for providing information individually and in focus group discussions that helped the survey team to get a better understanding of the nutrition situation in the area.

EXECUTIVE SUMMARY

Bakool region comprises of five districts: Huddur, Tieglow, Wajid, Elberde and Rabdure. The region is predominantly agropastoral with the exception of the pastoral sections in Elberde district, parts of Rabdure and Northern Huddur. The agro-pastoralists in Bakool Region mainly keep cattle and camel and produce sorghum. From July 4th – 18th, 2008 FSAU, WVI and IMC in partnership with WFP, UNICEF, Green Hope, and SRCS conducted an inter-agency nutrition assessment covering the agropastoral populations in Rabdure Tieglow districts and Huddur districts. The assessment excluded two districts i.e. Wajid which had just been assessed by ACF and hence repetition was not required, and Elberde district which is predominantly pastoral and had been assessed earlier in April 2008. The assessment was in response to the need to determine the malnutrition levels for the Bakool agropastoral livelihood and to inform on the intervention responses for the region.

Using, ENA for SMART software, a total of 834 households were calculated as the minimum number of households to be sampled among the agropastoral livelihood for both anthropometric and mortality assessments from 28 clusters. However a total of 840 households were assessed in the field for mortality and 390 of these with children 6-59 months, for anthropometry. Overall, samples of 707 children aged 6- 59 months were assessed from the agropastoral livelihood for anthropometric assessment. The main objective of the survey was to determine the level of wasting among children aged 6-59 months, analyze the possible factors contributing to malnutrition, and assess the dietary diversity, morbidity and mortality rates in the Bakool agropastoral livelihood system.

The global acute malnutrition (GAM) rate (weight for height <-2 Z score or oedema) was estimated at **25.2%** (22.1 – 28.6) and severe acute malnutrition (SAM) rate (weight for height <-3 or oedema) was estimated at **3.8%** (2.6 – 5.6) among the agropastoral population in Bakool. The results indicate a **Very Critical** nutrition situation according to WHO classification, and deterioration when compared with the most recent nutrition assessment conducted in November 2007 which reported a GAM rate of **17.4%** (11.3 – 23.5) indicating a *Critical* situation based on WHO classification. When estimated using WHO Anthro (2006) reference standards, GAM rates are almost the same, while SAM rates more than doubled (*see Table 1*.). Based on NCHS, t stunting and underweight rates of **20.4%** (17.5 – 23.6) and **38.3%** (34.8 – 42.0) respectively were reported. The retrospective crude and under five mortality rates were estimated at **0.57**(0.33 – 1.0) and **1.72** (0.89 – 3.32) deaths/10,000/day respectively, and are both below alert levels based on the WHO classification. Most of the deaths of children aged below five years and those aged above five years, were reportedly caused by diarrhoea, Acute Respiratory Infection (ARI), measles and malaria. Other reported causes of deaths included suspected malaria/febrile illnesses, complications arising during birth and anaemia while the remaining were due to unknown causes.

As in the past assessments, high morbidity rates were reported in the study population, with 35.9% of the assessed children in Bakool agropastoral reported to have suffered from one or more communicable childhood diseases in the two weeks prior to the assessment. The incidences of reported diarrhoea, ARI, suspected malaria/febrile illness were 24.2%, 11.7%, 9.9% respectively. However, Rapid Diagnostic Tests (RDT) conducted for malaria confirmed only 2.6% cases of malaria as positive for *Plasmodium falciparum* while suspected measles was low at 1.3%. These levels are consistent with seasonal morbidity patterns recorded from health facilities, analysis however shows that there is no statistical association between acute malnutrition and morbidity rates, (p>0.05).

Poor feeding practices persist in Bakool like in other parts of Somalia and have been associated with high levels of acute malnutrition. Most children are not only initiated to breastfeeding too late, 2-3 days after birth, are also introduced to complimentary foods early in life while breastfeeding does not continue to the recommended 24 months of age . About 32.5% of the children aged 6-24 months had

stopped breastfeeding at the time of the assessment. In addition, the majority of the children (>85%) in the study population had been introduced to complimentary food too early, before the recommended age of six months. Moreover, only 3.1% of the children aged 6-24 months were fed for the recommended five times in a day. However, an analysis of distribution of levels of acute malnutrition between the different age groups did not show a significant difference in the likelihood of acute malnutrition between the breastfeeding age groups and older children. Poor breastfeeding practices do not only deny the children the multiple nutritive and health benefits associated with breastfeeding but also expose them to malnutrition, morbidity and even death.

Poor status for health programmes is an important risk factor to the poor nutrition situation in Bakool region. Measles vaccination status (by recall) for eligible children (9-59 months old) in the study population was low at 45.4% as was status for vitamin A supplementation at 57.4%. Polio immunization status though relatively higher at 79.3% in Bakool agropastoral, still fell just below the recommended 95% level (Sphere, 2004). Children who miss these health services are deprived the associated health and nutritive benefits.

Further findings from Bakool agropastoral assessment indicate that the access to basic services of water, health and sanitation is a major problem in the study areas, with only 10.4%, 68.5%, 59.2% of the assessed households reportedly accessing safe water, sanitation facilities and health services respectively. Mechanisms to sustain proper sanitation of the water systems are also lacking in the study area leading to contamination of water. Consumption of water from unsafe sources predisposes children/adults to water borne illness such as diarrhoea and cholera, while limited access to health services may lead to complications of easily curable diseases and may ultimately lead to acute malnutrition and/ or death.

The food security and nutrition situation remains precarious in the Bakool agro-pastoralists. Households normally rely on their animals for milk and income (accessed through the sell of livestock) for purchase of other food and non food items. With poor livestock body conditions following the lack of pasture and water, milk production and access to income have declined, compromising the community's access to adequate dietary intake. Overall, only half of the households, 55.6% in Bakool agropastoral livelihood zone, reportedly consumed diversified diets comprising of four or more food groups in the 24 hours prior to the assessment. This is exacerbated by the fact that half of the households rely on purchasing food (54.6%) whose prices are currently very high, and nearly one-fifth (14.3%) rely on food aid. Milk and cereal are relied on for both consumption at the household level and for sale to purchase other food and non food requirements However, the low consumption of such food groups as fruits, vegetables and pulses was of great concern because such food groups are important sources of micronutrients. This exposes the population to risks of micronutrient deficiencies. Qualitative information indicates that households have resorted to various coping strategies including reduction in purchase of food and non-food items, switching to cheaper cereals, skipping meals and increased sale of bush products.

In conclusion, the nutrition situation among the Bakool agropastoral population is ***Very Critical*** and has deteriorated since the November 2007 nutrition assessment and the Post Gu' 08 integrated nutrition analysis. This could be attributed to the impact of the sharp increases in local cereal and imported commodity prices, as well complete crop failure following a dry Jilaal '08 season, which compounded the effects of previous successive below average seasonal rains. In Bakool's Huddur market, for example, sorghum prices in July '08 increased to over 400% when compared to July '07 prices (from 3,000/kg to 15,350/kg) and are 270% higher than Jan '08 (4,125/kg) prices. Cereal prices are expected to continue to rise due to complete crop failure, very low cereal stocks and the subsequent low market supply of cereals. The situation has been made worse by rising global food prices coupled with the chronically high morbidity and poor child feeding and care practices which have remained unaddressed over years. Humanitarian intervention efforts in Bakool region has been

scaled down due to escalating on-going civil insecurity.

Specific recommendations are outlined below.

Immediate Interventions

- Rehabilitation of acutely malnourished children through the existing selective feeding and outreach programs and active case finding until household food security is restored and critical public health issues are addressed. Capacity building of the existing MCH and the community to manage acutely malnourished children through locally available system could be explored.
- Intervention programmes are urgently needed on improving water, sanitation and hygiene practices including health education to educate the community on importance of domestic treatment of drinking water.
- Improving status of health programmes are essential, especially for measles vaccination and vitamin A supplementation. Vigorous campaigns targeting the rural population are required in Bakool region. Care givers need also be counselled on the benefits of vaccinations to their children
- Intensify nutrition and health education targeting care givers with messages on the importance of exclusive breastfeeding, improved child-feeding practices appropriate health-seeking behaviour and improved hygiene & sanitation practices

Long term Interventions

- Rehabilitation/protection of water systems including well and water catchments. The community should be trained on improved sanitation of the water systems and the safe water chain
- There is need for establishment or strengthening of health facilities and satellite services especially in rural villages where they are not available
- Intensifying health and nutrition education activities at the household level to address care concerns, targeting mothers, and other caregivers is key for long term benefits. The main areas of focus should include promotion of exclusive breastfeeding, appropriate young child feeding, dietary diversification, and improvements in household hygiene including health care practices.

Summary of findings

Indicator	N	% C.I
	Bakool Agro- pastoral	
Total number of households surveyed	390	100
Mean household size	5.8	SD=2.0
Total number of children assessed	707	100
Child sex: Males (boys)	357	50.5
Females (girls)	350	49.5
Global Acute Malnutrition (WHZ<-2 or oedema) (NCHS)	178	**25.2** (22.1-28.6)
Severe Acute Malnutrition (WHZ<-3 or oedema) (NCHS)	27	**3.8** (2.6-5.6)
Oedema	4	0.6 (0.2-1.5)
GAM estimates by WHO Anthro (2006) Standards:	182	**25.7** (22.2-28.7)
SAM estimates by WHO Anthro (2006) Standards:	66	**9.3** (7.1-11.6)
Global Acute Malnutrition (WHM<80% or oedema)	122	**17.3** (14.6-20.3)
Severe Acute Malnutrition (WHM<70% or oedema)	24	**3.4** (2.2-5.1)
Proportion of stunted children (HAZ<-2	144	**20.4** (17.5-23.6)
Proportion of underweight children (WAZ<-2)	271	**38.3** (34.8-42.0)
Proportion of acutely malnourished pregnant women (MUAC≤23.0).	30	(N=77) 39
Proportion of severely malnourished pregnant women (MUAC≤18.5)	2	**0.7**
Proportion of children reportedly with diarrhoea in 2 weeks prior to assessment	171	24.2 (21.1-27.6)
Proportion of children reportedly with ARI within two weeks prior to assessment	83	11.7 (9.5-14.4)
Children reportedly with fever/ suspected malaria in 2 weeks prior to assessment	70	9.9 (7.8-12.4)
Suspected measles within one month prior to assessment	9	1.3 (0.6-2.5)
Children (9-59 months) immunised against measles (N=661) (recall)	392	55.4 (51.7-59.1)
Children who have ever received polio vaccine	561	79.3 (76.1-82.2)
Children who received vitamin A supplementation in last 6 months	406	57.4 (58.7– 61.1)
Proportion of households who consumed ≤3 food groups (poorly diversified diet)	173	44.4 (39.4 – 49.4)
Proportion of children 6-24 months who are breastfeeding (N=251)	169	67.3 (61.3-73.2)
Under five Mortality Rate (U5DR) as deaths/10,000/ day		**1.72** (0.89-3.32)
Crude Mortality Rate (CDR) as deaths/10,000/ day		**0.57** (0.33 -1.00)

1.0   INTRODUCTION

Historical Context

Bakool region in the southwest of Somalia comprises of five districts; Huddur (the regional capital), Wajid, Tieglow, Rabdure and Elberde. It neighbours Ethiopia to the North, Bay region to the South, Hiran region to the East and Gedo region to the west. The region has two dominant livelihoods; the agropastoral and pastoral which are further sub-divided into four livelihoods zones, (1) Southern Inland Pastoral, (2) Southern Agropastoral (3) Bay Bakool Agro pastoral - High potential sorghum and (4) South East Pastoral (See Map 1).

Map 1: Bakool Livelihood Zones
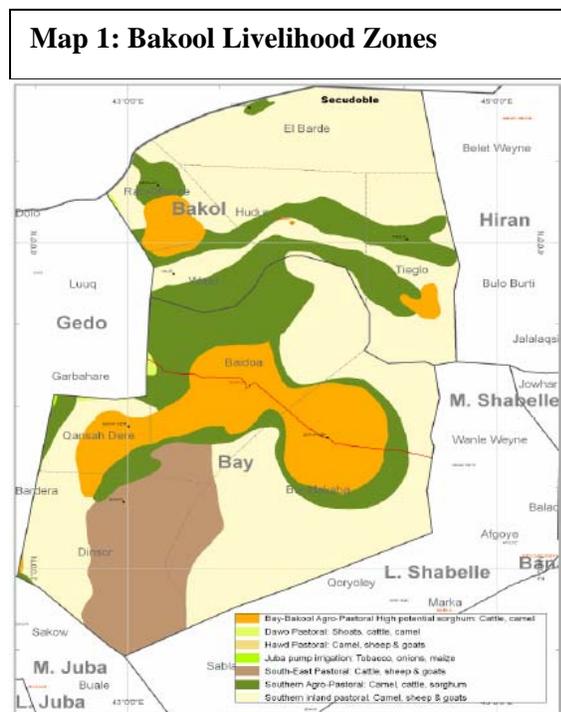
Since the collapse of the Somali Central Government in 1991, South and Central Somalia including the Bakool Region have faced a series of disasters, both natural (droughts, disease outbreak) and man-made (poor governance, sporadic armed conflict and widespread human rights abuses, displacement). The aftermaths of which has been limited resilience for parts of the population to recover from shocks, leading to disruption or total loss of livelihood systems for the most vulnerable. In most areas in the region the population relies on humanitarian organizations for delivery of basic services, but these services are often disrupted by frequent insecurity. This has had a devastating impact on food and nutrition security in the region.

The Food Security Context

The agropastoralist population in Bakool region have been experiencing relatively low sorghum production from *Gu* '05 to *Gu*'07 with exception of *Deyr* '06/07, in which production was well above average at 398% of PWA with an estimated production of 5,538 Mt. According to the FSAU Post Gu '08 integrated analysis in Bakool region, the food security and nutrition situation in Bakool deteriorated for all livelihoods, including the urban poor since *Gu* '07. An estimated 145,000 agro-pastoralists and pastoralists in the region are now either in **Acute Food and Livelihood Crisis** (**AFLC**) or **Humanitarian Emergency (HE)**. This is a 12% increase from the total number of people previously in AFLC or HE (from April – June '08). In addition, a total of 25,000 urban poor are also now in **AFLC.** The deterioration is mostly attributed to poor rainfall as well as sky rocketing of cereal and imported commodity prices and hyper-inflation. Poor rains in all livelihoods resulted in complete crop failure (5% of PWA); significant deterioration in vegetation conditions (pasture and browse); acute water shortages; decreased herd sizes from Dec. '07; 19% for camel, 31% for cattle, and 17% for sheep/goats; huge livestock migration to the Bay and Lower Shabelle regions; and thus low livestock milk production. Levels of social support (zakat) in the form of cereal donations also reduced significantly as a result of the crop failure.

Health and Nutrition context

Morbidity and malnutrition exhibit a synergistic relationship whereby malnourished children have lowered immunity and are more susceptible to illness while sick children are likewise more prone to malnutrition due to such factors as diminished food intake, absorption and utilization. Common illness reported in Bakool from the MCH and nutrition/health assessments include watery diarrhoea, ARI, malaria/febrile illness, kalazar (endemic in the area) , intestinal worms and skin diseases. Health services in the area are scarce due to limited health facilities that are not accessible by the majority of the rural population and sick people often resort to seeking health services from traditional healers, over the counter drugs and reading of Koran. With the poor health services, the negative impact of morbidity is immense.

The nutrition situation in the Post *Deyr* '07/08 in most parts of Bakool region remained *Critical* as recorded in *Gu* '07, with the exception of Wajid and Huddur districts, which were classified as *Serious.* This analysis indicated no significant change from historical trends and is consistent with the long term malnutrition estimates for the area. *Chart 1* provides the trends in levels of acute malnutrition (WHZ <-2/oedema) in Bakool (2001-2008) based on nutrition surveys conducted by FSAU and partners, ACF and MSFB in the region. As is illustrated, the rates of acute malnutrition have been consistently at *Serious* (10-14.9%) or *Very c*ritical *(>20%)* levels from 2000. The persistent Critical situation reported over the years in the entire region is attributed to the interaction of multiple factors primarily morbidity, poor social care environment (breastfeeding, childcare) and public health-related factors such as exposure to diseases, poor water and sanitation and access to basic health services. The main agencies providing health and nutrition services are IMC, MSF-B, ACF and World Vision. The unstable nutrition and food security situation calls for constant monitoring to ascertain the situation and recommend appropriate interventions.

Chart 1 : Trends in levels of Acute Malnutrition 2001-2008 in Bakool Region (WHZ<-2 or Oedema)
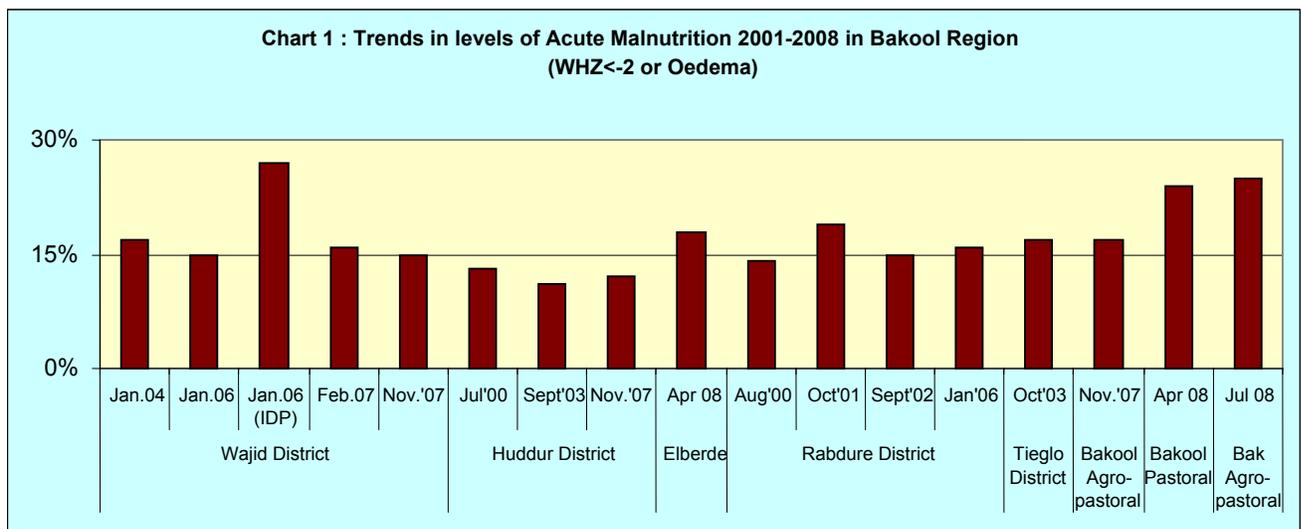
2.0   ASSESSMENT OBJECTIVES

The overall objective for the assessment was to establish the extent and severity of acute malnutrition, determine the causes, and to monitor the trends of malnutrition in Bakool agropastoral livelihood zone.

Specific Objectives were:
1. To estimate the level of acute malnutrition and nutritional oedema among children aged 6-59 months in Bakool agropastoral livelihood zone.
2. To estimate the level of acute malnutrition among women aged 15-49 years in Bakool agropastoral livelihood zone.
3. To identify factors influencing the nutritional status of the children in Bakool agropastoral livelihood zone.
4. To estimate the prevalence of some common diseases (measles, diarrhoea, febrile illnesses and ARI) in Bakool agropastoral livelihood zone.
5. To estimate the prevalence of malaria in Bakool agropastoral livelihood zone using Rapid Diagnostic Tests (RDT).
6. To estimate the measles and polio vaccination and Vitamin A supplementation status among children in Bakool agropastoral livelihood zone.
7. To assess child feeding and care practices in Bakool agropastoral livelihood zone.
8. To estimate the crude and under-five mortality rates in Bakool agropastoral livelihood zone.

3.0   METHODOLOGY

A cross-sectional assessment was conducted between 4th up to 18th July 2008, among the agro-pastoral populations of Bakool Region. Two-stage cluster probability proportional to size (PPS) sampling methodology was used to select 559 children aged 6-59 months from 28 clusters in the agropastoral livelihood. Sample sizes (number of households and number of children) were calculated using the Epiinfo/Ena 2008 software after considering the population size, estimated prevalence and desired precision. A list of all villages in the zone with their respective populations formed a sampling frame and was used to construct cumulative population figures for the assessment area from which 28 clusters were randomly drawn for the livelihood zone (Appendix 4). Selection of respondents within the village was done randomly, preferably from a list of eligible names or a map of households. Where these were not available, the number of households in the village was estimated from the population figures (the total population divided by the mean household size). This is the interval, n. Starting from a random household, every nth household was selected and all eligible children (aged 6-59 months) in that household were measured. Retrospective mortality data 90 days was collected from all the households in each cluster from each livelihood including even those that did not have children aged 6-59 months.

Quantitative data was collected through a standard household questionnaire developed for nutrition assessments in Somalia (see appendix 2). Retrospective mortality data for 90 days prior to the assessments and Rapid Diagnostic Test for malaria was also collected among the study households using the standard questionnaires (see appendix 3 and 4 respectively). Qualitative data was collected 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), undertaking malaria RDTs, standardisation of questions in the questionnaire, levels of precision required in measurements, clinical 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 in Wajid District, 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 ENA software.

4.0   ASSESSMENT RESULTS

4.1   Household Characteristics of Study Population

The nutrition assessment covered a total of 390 household's in agropastoral populations. The mean household sizes and number of under five children were 5.8±2.0 and 2.0±0.8 respectively in Bakool agropastoral population. A total of 707 children in agropastoral population aged 6-59 months were assessed. The household characteristics by each study population are presented in Table 4.1 below.

Table 4.1: Household Characteristics

Characteristics		Bakool Agropastoral	
		N	% (C.I)
Total Households		390	100
Household size (Mean):		5.8	SD=2.0
Mean No of Under fives		2.0	SD=0.8
Sex of Household Head:			
	Male	266	68.2
	Female	124	31.8
Host IDP's	Yes	29	7.6
	No	351	92.4
Income source			
Crop sales/ Farming		149	38.5 (33.7-43.6)
Casual labour		145	37.5 (32.7-42.5)
Animal and its products sales		56	14.5 (11.5-18.5)
Trade		21	5.4 (3.5-8.3)
Salaries/wages		10	2.6 (1.3-4.9)
Remittances		6	1.6 (0.6-3.5)
Dietary Diversity			
	≤ 3 Food groups	173	44.4 (39.3-49.4)
	≥ 4 Food groups	217	55.6 (50.6-60.6)
Mean HDDS		4.1	SD=1.9 (SE=0.1)
Meal	One	20	5.2 (3.3-8.0)
	Two	284	73.2 (68.4-77.5)
	Three	84	21.6 (17.7- 26.2)
Ownership of net		206	14.8 (13 – 16.8)
Use of net		195	14 (12.2- 15.9)
RDT positive		36	2.6 (1.8 – 3.6)

The results showed that in the study populations, that the larger proportion (>60%) of the assessed households were male headed, however almost a third were female headed. (Table 4.1). More than one-third (>30%) of the households accessed income mainly through crop sales/farming, while two-third the population accessed income through causal labour. The rest of the households mainly accessed income through animal sales, trade and remittance.

Few households in this assessment 7.6% were hosting recent IDP/urban poor. The majority (>80%) of the households hosting IDP's in the study population reported that IDP's had exerted varying impacts but mainly increased food sharing and expenditure on food. Mosquito net ownership was very low in all the assessed households with only 14.8% and 14% reportedly sleeping under a net. A large proportion (>60%) of the nets owned were supplied by the Somalia Global Fund for Malaria (GFSOM).

4.2 Access to Water, Sanitation and Health Facility

Table 4.2:

	Bakool Agropastoral	
	N	% (C.I)
Have access to safe water (N=390)		
Yes	42	10.4 (8.0- 14.4)
No	348	89.2 (85.6-92.0)
Reason for water inaccessibility		
Not available	280	82.2 (77.7-86.0)
Distance too far	42	12.4 (9.2-16.4)
Cant afford	19	5.5 (3.4-8.5)
Others, e.g. salty	0	0
Drinking water source		
Taped/piped water	1	0.3 (0.0- 1.6)
Tanker truck	1	0.3 (0.0- 1.6)
Borehole	4	1.0 (0.3- 2.8)
Spring	0	0
Bottled water	0	0
Roof top water	0	0
Surface water	384	98.5 (96.5-99.4)
Main source of water for other domestic use		
Borehole	6	1.5 (0.6- 3.5)
Surface water	384	98.5 (96.5- 99.4)
Have access to latrines (n=390)		
Yes	123	31.5 (27-36.4)
No	267	68.5 (63.6-73)
Type of sanitation facility		
Bush	267	68.5 (63.6-73)
Traditional Pit Latrine	123	31.5 (27-36.4)
Reason for latrine inaccessibility		
Pastoral lifestyle	143	53.6 (47.4-59.7)
Lack of resource	75	28.1 (22.8- 33.9)
Do not see need	49	18.4 (13.9-23.5)
Hand washing practices		
Before eating food	375	98.2(96.1-99.2)
Before preparing food	192	50 (44.9-55.1)
Before feeding the baby	193	50.3 (45.2-55.4)
After cleaning baby bottom	304	79.2 (74.2-83.0)
After defecation	68	17.8 (14.2- 22.1)
Have access to health facility		
Yes	231	59.2 (54.2- 64.1)
No	159	40.8 (35.9-45.8)
Reason for HF inaccessibility		
Distance too far	89	56 (47.9- 50.2)
Not available	67	42.1 (34.4-63.8)
Cant afford	2	1.3 (0.2-4.5)
Security concerns	1	0.6 (0.0- 3.5)
Others, e.g. workload	0	0

Access to basic services in the study areas, as in most other parts of southern Somalia remains unacceptably low with 31.5%, 59.2%, 10.4%, of the assessed households reportedly accessing sanitation facilities (latrines), health services and safe domestic drinking water respectively. The main reasons given for limited access to these services were unavailability, pastoral lifestyle and long distance to the available services. Specific reasons for low access the three basic services are delineated in table 4.2.

Lack of sanitation facilities leads to poor human faecal disposal in the open place or bush. During rainy seasons, the human waste is washed into the unprotected water sources for drinking and household use, thereby posing health risks such as diarrhoea in an environment with limited health services to assist the affected people. The limited access to health services implies that sick children/adults do not receive prompt treatment leading to complication of the illnesses, acute malnutrition or eventual death.

A large number of the assessed households practiced basic hygienic hand washing practices only before eating (98.2%). A small proportion washed their hands after defecation, before feeding the baby, after cleaning the baby's bottom and before preparing food as indicated in Table **4.2**

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 in the study populations. Other food items frequently consumed were sugar, milk, oil/fat and pulses. The remaining food groups were consumed by a relatively lower proportion of the assessed households. Lack of consumption of some of these food groups such as fruits, eggs, vegetables, roots and fish may be attributed to lack of nutritional knowledge on the importance of taking such food groups or due to cultural reasons that shape food selection habits where such food are unfamiliar or not considered as part of society foods.

Fig: 4.3.1 Distribution of Food Groups Consumed by Households in Bakool Agro-pastoral
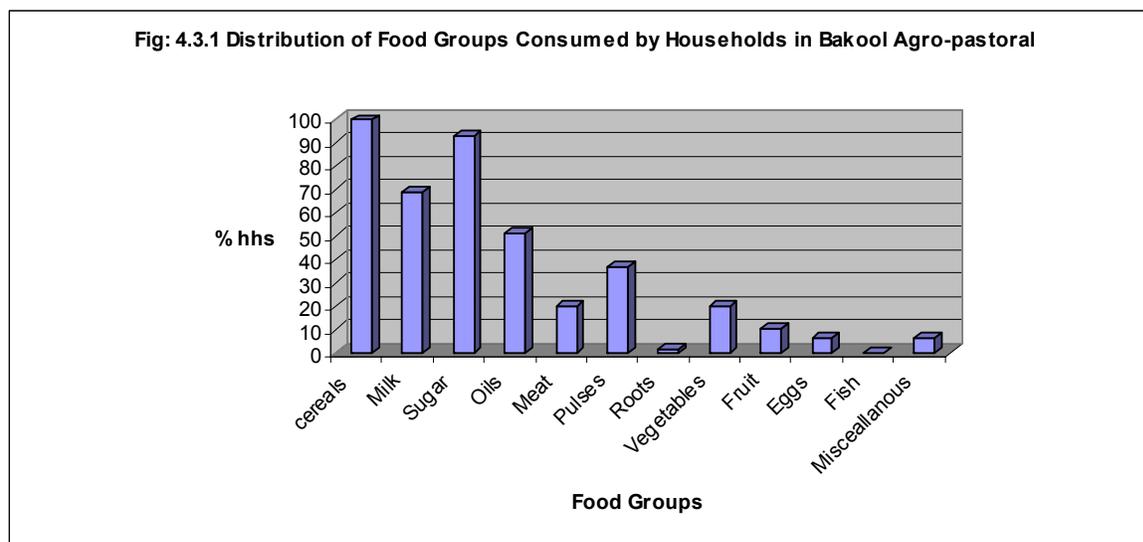
Table 4.3.1:

	Bakool Agropastoral	
Main source of food	n	% (C.I)
Purchasing	213	54.6
Own production	114	29.2
Food aid	56	14.3
Gifts from friend	5	1.2
Borrowing	1	0.2
Others	1	0.2
Main source of cereals		N=390
Purchasing	179	46.1
Own production	119	30.6
Food aid	80	20.6
Gifts	6	1.5
Bartered	3	0.7
Borrowing	2	0.4
Main source of milk		N=390
Purchasing	146	54.2
Own production	122	45.3
Gifts	1	0.3

As indicated in table 4.3.1, overall, purchase was the main source of foods in the study populations. Purchase was the main sources of food for majority (54.6%) of the households in Bakool agropastoral while about nearly one-third (29.2%) of the households reported own food production as their main food source. As expected among agropastoral population, own food production was the main source of cereals and milk. In the study population, 30.6% and 45.3% of the households assessed reported own production of cereal and milk respectively. However, a variation was noted on main milk and cereal sources with about half, 54.2%, 46.1% of the households reportedly sourcing milk and cereal through purchase This may be due to the fact that the Bakool agro-pastoral livelihoods experienced poor rains and consequently low milk and cereal production, out migration of livestock, and/or poor harvest. Almost half (44.4%) of the households were reportedly consuming three or less food groups and two meals per day.

4.3.2   *Dietary Diversity*

As shown in table 4.3.2 the study populations in the households assessed consumed one to eleven food groups with three food groups being the most frequently (21.5%) consumed. The mean dietary diversity score reported was 4.1 ±1.9 within the previous 24 hours.

	Bakool Agro-pastoral	
	n	% (C.I)
No of food groups consumed		
1 food group	21	5.3
2 food groups	68	17.4
3 food groups	84	21.5
4 food groups	57	14.6
5 food groups	64	16.4
6 food groups	44	11.2
7 food groups	32	8.2
8 food groups	10	2.5
9 food groups	6	1.5
10 food groups	3	0.7
11 food groups	1	0.2
No. Having Diversified Diet		
1-3 food groups	173	44.4
≥ 4 food groups	217	55.6
Mean HDDS	4.1 (SD=1.9)	

Overall almost half (44.4%) of the households assessed were reportedly consuming three or less food groups with the majority (73.2%) of the households were reportedly consuming two meals per day.

Fig 4.3.2: Househol Dietary Diversity in Bakool Agro-pastoral LZ
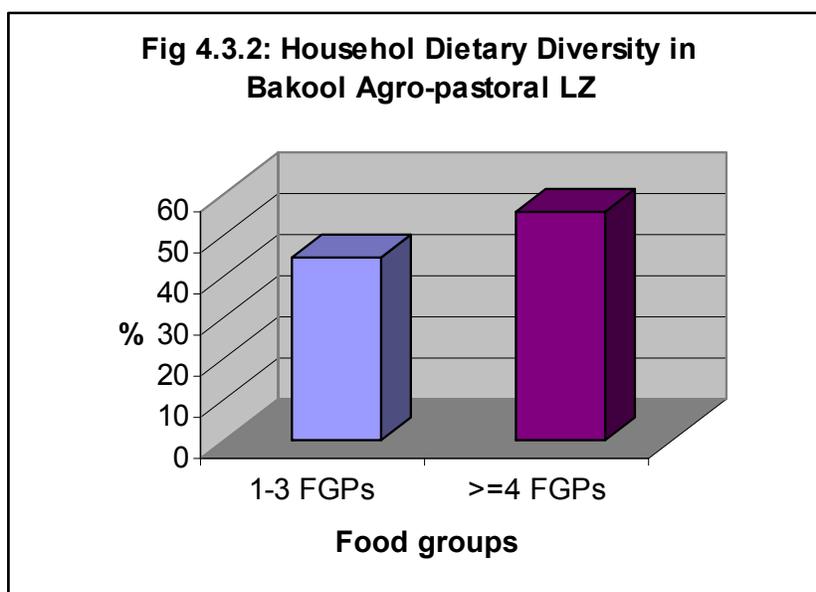
4.4 Child feeding, Morbidity, immunization and Health Seeking Behaviour
4.4.1 *Morbidity Immunization and Health Seeking Behaviour*

High morbidity rates were reported in the study population with 35.9% of the children assessed being sick in the two weeks prior to the assessment. Overall, in the study population, over one-third (>30%) of the children who were reported to have been sick sought health services from public health facilities in the area. However, 21.3% did not seek any health services when the children were sick. A significant proportion administer self medication (18.9%) at home while others consult traditional healers while the remaining sought medical assistance from the private pharmacy/clinic. (Table 4.4)

Table 4.4: Health seeking behaviour	Bakool Agropastoral	
	n	% (C.I)
Child fell sick		
Yes	254	35.9(32.4- 39.6)
No	453	64.1(60.4- 67.6)
Where health service sought		
Public health facilities	101	39.8
No assistance sought	55	21.3
Own medication	48	18.9
Private pharmacy/clinic	34	13.4
Traditional healers	17	6.7

Table 4.5: Morbidity, measles immunisation, polio vaccination and vitamin A supplementation		
	Bakool Agropastoral	
	n	**% (C.I)**
Incidence of major child illnesses		
Proportion of children with diarrhoea in 2 weeks prior to assessment	171	24.1 (21.1-27.6)
Proportion of children with ARI within 2 weeks prior to assessment	83	11.7 (9.5-14.4)
Children with febrile illness in 2 weeks prior to assessment	70	9.9 (7.8-12.4)
Proportion of persons confirmed Malaria (RDT) positive		2.6 (1.8-3.6)
Suspected measles within one month prior to assessment (N=661)	9	1.3 (0.6-2.5)
Immunization Status		
Children (9-59 months) immunised against measles	392	55.4 (51.7-59.1)
Children who have ever received polio vaccine	561	79.3 (76.1-82.2)
Children who received vitamin A supplementation in last 6 months	406	57.4 (47.4- 67.4)

Diarrhoea was the most commonly reported illness in the study population at 24.1%. High incidences of ARI and febrile illnesses (suspected malaria) were also reported (see Table 4.7). These levels were consistent with seasonal morbidity patterns recorded from the MCH. Diarrhoea is common at the onset of rainy season possibly due to contamination of water points by run off water. Rapid Diagnostic Tests (RDT) conducted for malaria (*Plasmodium falciparum)* reported a total positive case rate of 2.6% in Bakool agropastoral population. The reported suspected measles cases were 1.3% in the study population (Table 4.7).

Children who had reportedly fallen ill were 1.18 times more likely to be acutely malnourished (RR= 1.18; CI: 0.91 – 1.53) especially from diarrhoea (RR=1.16; CI: 0.87 – 1.54) p<0.5

Overall, status for health programmes fell below the recommended 95% level (Sphere, 2004) in the study population. Vitamin A supplementation and measles vaccination status were reported at 57.4% and 55.4% respectively. Polio immunization 79.3% was relatively higher but also below the recommended status of 95%.

4.4.2 Child Feeding Practices
Poor feeding practices persist in Bakool agropastoral and similar to other parts of Somalia is well below standard. About 32.5% of the children aged 6-24 months had stopped breastfeeding at the time of the assessment. In addition, the majority of the children (>85%) in both study populations had been introduced to complimentary food before the recommended age of six months. Only 3.1% of the children aged 6-24 months were fed for the recommended five times in a day. However, analysis of distribution of levels of acute malnutrition between the different age groups did not show a significant difference in the likelihood of acute malnutrition between the breastfeeding age groups and older children. Poor breastfeeding practices not only deny the children the multiple nutritive and health benefits associated with breast milk but also expose them to malnutrition, morbidity and even death.

Table 4.5 Child Care Practices	Bakool Agropastoral	
	N	% (C.I)
Breastfeeding		
Yes	169	67.3
Breastfeeding frequency		
2 times or less	6	3.5
3-6 times	62	36.5
On demand	102	60
Breastfeeding Duration		
Less than 6 months	14	16.9
6-11 months	34	41
12-18 months	22	26.5
≥18 months	13	15.7
Introduction of Complimentary food		
0-3 months	143	56.5
4-5 months	71	28.1
6 months	25	9.9
7 months or more	14	5.5
Complimentary feeding frequency		
1-4 times	685	96.9
5 or more times	22	3.1

4.5   Nutrition Status

4.5.1   *Malnutrition by Livelihoods*

A total of 707 children (49.1% boys and 50.9% girls, sex ratio 1.1) from Bakool agropastoral population aged 6-59 months were assessed. Results show ***Very critical*** nutrition levels according to WHO classification in Bakool agropastoral with GAM rate of **25.2%** (CI: 22.1 – 28.7) and SAM rate of **3.8%** (CI: 2.6 – 5.6). A summary of the findings for the acute malnutrition rates is given in table 4.9. These results are inconsistent with past assessments in the study areas and indicate deterioration.

Table 4.9: Summary of Malnutrition rates by Livelihood systems

Malnutrition rates	Bakool Agropastoral	
	No	% (CI)
Global Acute Malnutrition (WHZ<-2 or oedema)	178	25.2 (22.1- 28.7)
Severe Acute Malnutrition (WHZ<-3 or oedema)	27	3.8 (2.6- 5.6)
GAM estimates by WHO Anthro (2005) Standards:	187	25.7 (22.2- 28.7)
SAM estimates by WHO Anthro (2005) Standards:	66	9.3 (7.1-11.6)
Global Acute Malnutrition (WHM<80% or oedema)	122	17.3 (14.6- 20.3)
Severe Acute Malnutrition (WHM<70% or oedema)	24	3.4 (2.2- 5.1)
Proportion of stunted children (HAZ<-2	144	20.4 (17.5- 23.6)
Proportion of underweight children (WAZ<-2)	27.1	38.3 (34.8-42)

When estimated using WHO Anthro (2006) Reference standards, more or less a similar GAM rate of **25.7%** (CI: 22.2 – 28.7) and almost triple relative SAM rates of **9.3%** (CI: 7.1 – 11.6) were reported..

The distributions of the weight-for-height scores in the Bakool agropastoral assessment were skewed towards the left depicting a poorer nutrition situation according to international (WHO) standards (Fig 4.4.1). The mean WHZ for Bakool agropastoral was -1.26 (SD=1.14; CI: -1.35 - -1.18)

Fig 4.4.1 WHZ Distribution curve for Bakool Agro-pastoral

A summary of the Nutrisurvey quality checks for the assessment given in appendix 7 indicates that the data collected in the assessment is of good quality and hence qualifies for publishing.
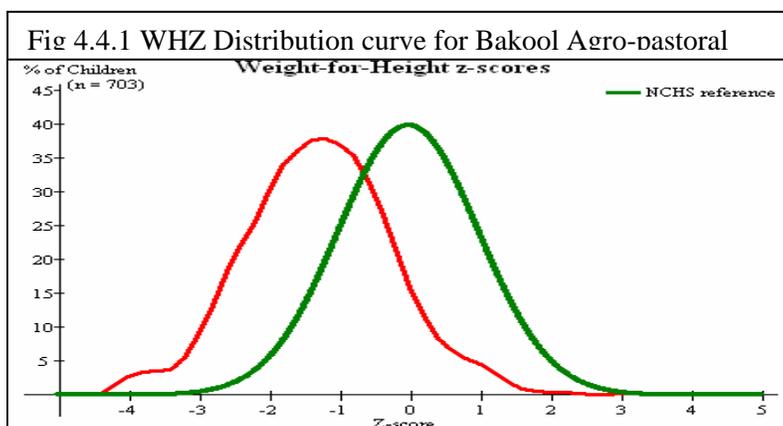
4.5.2   Malnutrition by Sex

Table 4.10   Distribution of children by nutritional status (WHZ-score or oedema) and child sex

Nutrition status	Bakool Agropastoral			
	Males		Females	
	n	%	n	%
GAM (WHZ<-2 /oedema)	94	26.3	84	24
SAM (WHZ<-3 /oedema)	17	4.8	10	2.9

Results of acute malnutrition among the surveyed population in all the study population using weight for height <-2 Z score or presence of oedema showed no statistical difference between the two sexes (p>0.05).

4.5.3   Malnutrition by Age.

Table 4.11 Distribution of Acute Malnutrition (WHZ Scores) by Age Group

Age (months)	Bakool Agropastoral		
	SAM n %	GAM	n %
6-17	1 (0.6%)		29(17.8%)
18-29	10 (5.0%)		51 (30.5%)
30-41	10 (4.9%)		37 (22.7%)
42-53	5 (2.6%)		28 (20.9%)
54-59	1 (0.8%)		33 (41.3%)
Total	27 (3.0%)		178 (25.1%)

Analysis of distribution of acute malnutrition between the different age groups showed varied levels of acute malnutrition. The age bracket of 42-53 months and 18-29 months recorded the lowest and highest proportion of acutely malnourished children, respectively. In the study population, analysis did not show a significant statistical difference in risks to acute malnutrition between the children in the breastfeeding age bracket of 6-24 months and those aged 25-59 months (p>0.05) indicating that the two age groups had equal risks to acute malnutrition. Likewise, there was no significant difference in the distribution of acute malnutrition between younger children aged 6-29 years and the older ones aged 30-59 months (P>0.05).

4.5.4   Acute Malnutrition using MUAC

Table 4.12   Child and Maternal Malnutrition by MUAC

Malnutrition rates	Bakool Agropastoral	
	No	% (CI)
Child MUAC	N= 707	
GAM (MUAC< 12.5 cm or oedema)	191	**27.0** (15.4 - 38.5
SAM (MUAC< 11.0 cm or oedema)	42	**5.9** (1.1– 10.7)
Pregnant Women MUAC	N=77	
Total acutely malnourished (MUAC< 23.0 cm)	30	**39.0** (28.0 -50.8)
Non pregnant women MUAC	N=302	
Total malnourished (MUAC≤ 18.5 cm)	2	0.7 (0.1 – 2.6)

Based on MUAC measurements, acute malnutrition rates were higher than the rates recorded by WHZ and inconsistent with past assessments which have indicated lower rates. (MUAC< 12.5 cm or oedema) of 27% (CI: 15.4– 38.5) with 5.9% severely malnourished was reported in this assessment.

Among the assessed women, the acute malnutrition rate recorded among pregnant women was very alarming at 39% (MUAC< 23.0 cm). Pregnancy raises physiological and nutritional demands of women making them vulnerable to malnutrition. Low malnutrition rates were however recorded among the non pregnant women with only two (0.7% with MUAC<18.5 cm) women being acutely malnourished among those who were assessed as indicated in Table 4.12

6   Mortality

A total of 4145 persons, 989 of them under fives from 840 households were assessed for mortality in the Bakool agropastoral livelihood assessment Out of these, 22 deaths were reported, 15 of them being children under five years of age. The specific distributions of these figures are shown in table 4.13

Table 4.13 Crude and Under five Mortality rates in Bakool Agropastoral		
	Bakool agropastoral	
	U5	Total
Total HHs surveyed		840
Total Population assessed in HHs	989	4145
Number who joined the HHs	10	130
Number who left the HHs	12	390
Number of births	60	60
Number of deaths	15	22
Mortality rate	**1.72** (0.89 – 3.32)	**0.57** (0.33 – 1.00)

The crude and U5 mortality rates were recorded at **0.57** (0.33-1.00) and **1.72** (0.89-3.32) per 10,000 per day, respectively and were both below the alert levels according WHO classification.

4.7   Qualitative Information

Qualitative information was collected from observations, focus group discussions and key informant interviews. A total of 6 focus group discussions were held with mothers and with men (elders). The discussions were centred on feeding and care practices, healthcare and food security and sanitation issues. The team also stopped randomly at settlements along the road for brief assessments, including observation of livestock body conditions and movements.

The average breastfeeding duration was reportedly 12-18 months of age. Milk (from cow, camel or goat) and sugared water are introduced within the first week of birth. Most children are started on sugared water before 3 months. Complementary feeding of semi solid foods, usually sorghum porridge mixed with milk, is introduced at 6 months, while solid foods are introduced at the age of 12 months. The average feeding frequency for children is up to 3 times a day. The common foods given to infants (0-2 years) are milk with water two times per day, sorghum or caanjera with tea 1-2 times a day. This therefore goes to show that child feeding and child care practices remain largely suboptimal and are likely driving factors to the high rates of wasting.

Sorghum, sugar rice, wheat flour and oil are the main foods consumed in the households. Their availability and access in the last 3 months has however deteriorated due to food insecurity caused by escalating food prices and drought conditions in Bakool region. Other foods like beans and potatoes are completely unavailable while the availability of cow and goat milk is very low due to poor purchasing power. There have also been a high number of animals dying in the district due to the drought, the hardier animal being trekked to areas of better pasture in Bay and Juba regions thus limiting access to milk. . In order to counter this food shortage, most households have resorted to eating fewer meals, borrowing or begging for food, consumption of weak animals and even going for a day without food. Although the sale of animals and animal products was by far the most important income source, usual labour is however gaining prominence given the increase in livestock death

The main source of water for most households is open wells, whose water is not treated and neither is drinking water treated at home. Most households do not have access to latrines; for those who have, it is shared between more than 10 persons. The faeces of the children are however not disposed of properly, and likely to contribute to further contamination. No food storage facilities are available; food is prepared and consumed at one sitting. On average, the distance to the water points for most of the households was less than a kilometre.

Among adults in the district, the most common illness reported was joint pain. For children, diarrhoea, ARI and worms were reported as the most common illnesses. Health facilities are available in the urban centres and are run by humanitarian organizations including World Vision, International Medical Corps and MSF-Belgium, in collaboration with UN bodies (WHO, UNICEF). Access to health services by rural communities is limited owing to distance while insecurity often disrupts delivery of services at the existing facilities.

5.0   Discussion

In the Bakool agro-pastoral assessment, a total of 707 children aged 6 – 59 months from 390 households were assessed; and mortality data collected from 840 households. Results indicate a **GAM** rate of **25.2%** (22.1 – 28.6) and a **SAM** rate of **3.8%** (2.6 – 5.6) and signify a *Very Critical* nutrition situation according to WHO classification, and a deterioration from past nutrition assessments. The retrospective crude and under five mortality rates were estimated at **0.57**(0.33 – 1.0) and **1.72** (0.89 – 3.32) deaths/10,000/day respectively, and are both below the alert levels according to the WHO classification. Most of the reported under five deaths and those aged above five years were reportedly caused by diarrhoea, Acute Respiratory Infection (ARI), measles and malaria. Other reported causes of death included suspected malaria/febrile illnesses, complications arising during birth and anaemia while the remaining were due to unknown causes.

High morbidity rates were reported in the study population with 35.9% reportedly suffering from one or more communicable childhood diseases in the two weeks prior to the assessment. The incidence of reported diarrhoea, ARI, suspected malaria/febrile illness was 24.2%, 11.4%, 9.9% respectively. However, Rapid Diagnostic Tests (RDT) conducted for malaria confirmed only 2.6% of the cases of malaria as positive for *Plasmodium falciparum.*   The reported suspected measles was low but significant at 1.3%. These levels were consistent with seasonal morbidity patterns recorded from the health facilities. Children who had reportedly fell ill in the assessed Bakool agropastoral livelihood were 1.18 times more likely to be acutely malnourished (RR= 1.18; CI: 0.91 – 1.53) especially from diarrhoea (RR=1.16; CI: 0.87 – 1.54) p<0.05.

Poor feeding practices persist in Bakool Agro-pastoralists like in other parts of Somalia and have been associated with high levels of malnutrition. Most children are not only initiated to breastfeeding late after 2-3 days of birth, but are also introduced to complementary foods early in life; and breastfeeding does not continue to the recommended 24 months. About one third (32.5%) of the children aged 6-24 months had reportedly stopped breastfeeding at the time of the assessment; in addition the majority of the children (>85%) had been introduced to complementary foods too early, i.e. before the recommended age of six months, and this predisposes the children to malnutrition. Moreover, only 3.1% of the children aged 6-24 months were fed the recommended five times a day. However, analysis of distribution of acute malnutrition between the different age groups did not show a significant difference in the likelihood of acute malnutrition between the breastfeeding age groups and older children. Poor breastfeeding practices do not only deny the children the multiple nutritive and health benefits associated with breast milk but also expose them to malnutrition, morbidity and even death.

Overall, the status for all the health programmes fell below the recommended 95% level (Sphere, 2004) and important risk factors to the poor nutrition situation in Bakool region. A high proportion (**35.9%)** of children had reportedly suffered from one or more communicable childhood diseases in the two weeks prior to the assessment; measles vaccination status for eligible children (9-59 months old) in the study population was very low at 55.4% and as was status for vitamin A supplementation at 57.4%. Polio immunization though relatively higher at 79.3% fell below the recommended 95% level (Sphere, 2004). Children who miss these health services are deprived the associated health and nutritive benefits.

Access to basic services of water, health and sanitation is a major problem in the study areas. A mere 10.4% of the households had access to clean drinking water, while 68.5% used proper sanitation facilities and only 39.8% of the children who fell ill visited a public health facility. These findings give an indication of the poor water, sanitation and health situation in the area, all of which are major risk factors affecting malnutrition and morbidity. The poor rains in the region have aggravated the

situation, leading to consumption of unsafe water and use of less water than required for daily needs. Consumption of water from unsafe sources predisposes children/adults to water borne illness such as diarrhoea and cholera, while limited access to health services may lead to complications of easily curable diseases and may ultimately lead to acute malnutrition and death.

The food security and nutrition situation remains precarious in the Bakool agro-pastoral population. Households rely on their livestock for milk and also sell them to be able to purchase other food and non food items. Thus with the currently poor livestock conditions and low production of milk due to the weakened animal body conditions (because of lack of adequate pasture and water), their food intake becomes compromised. Overall, about half, 55.6%, of the households, consumed diversified diets comprising of four or more food groups in the 24 hours prior to the assessment. This is made worse by the fact that half of the households mainly rely on purchasing food (54.6%) and nearly one-fifth (14.3%) on food aid. The current food prices in the market are very high and out of reach for many households. Milk and cereal are relied on for both consumption at the household level, and for sale to purchase other food and non food requirements However, the low consumption of such food groups as fruits, vegetables and pulses was of great concern because such food groups are important sources of micronutrients. This exposes the population to risks of micronutrient deficiencies.

Overall the key underlying factors are child care and morbidity, ARI in particular; poor sanitation and lack of adequate and safe water. Feeding practices for children are persistently poor, preventable diseases are prevalent and access to maternal and child care is suboptimal. Integrated approaches should, therefore, be undertaken to reduce risk factors such as poor child care, unsafe drinking water, and limited sanitation and hygiene services. Measures to increase access to health facilities and improved status of health programmes would play a critical role in both preventing and treating diseases. , It is also very crucial to note the role of increased food prices and inadequate water and pasture which have affected the animal sales and production (hence directly affecting the income of the households) in the area and are probably currently the direct cause of inadequate food intake in the households. Specific recommendations are outlined below.

6. 0   Recommendations

The poor nutrition and health situation in the study areas is attributed to multiple and interrelated factors that call for integrated intervention efforts to address both immediate life saving needs in addition to developing longer term strategies to enhance access to basic services and support and sustain livelihood systems and social protection mechanisms. Specific recommendations include:

Immediate Interventions.

- Rehabilitation of acutely malnourished children through the existing selective feeding and outreach programs and active case finding until household food security is restored and critical public health issues are addressed. Capacity building of the existing MCH and the community to manage acutely malnourished children through locally available system could be explored.
- Intervention programmes are urgently needed on improving water, sanitation and hygiene practices including health education to educate the community on importance of domestic treatment of drinking water.
- Improving status of health programmes are essential, especially for measles vaccination and vitamin A supplementation. Vigorous campaigns targeting the rural population are required in Bakool region. Care givers need also be counselled on the benefits of vaccinations to their children
- Intensify nutrition and health education targeting care givers with messages on the importance of exclusive breastfeeding, improved child-feeding practices appropriate health-seeking behaviour and improved hygiene & sanitation practices

Long term Interventions

- Rehabilitation/protection of water systems including well and water catchments. The community should be trained on improved sanitation of the water systems and the safe water chain
- There is need for establishment or strengthening of health facilities and satellite services especially in rural villages where they are not available
- Intensifying health and nutrition education activities at the household level to address care concerns, targeting mothers, and other caregivers is key for long term benefits. The main areas of focus should include promotion of exclusive breastfeeding, appropriate young child feeding, dietary diversification, and improvements in household hygiene including health care practices.

QNO:

APPENDIX 1: NUTRITION ASSESSMENT HOUSEHOLD QUESTIONNAIRE, 2008

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

Q1-8 Characteristics of Household

Q1. Household size[1] ?_____

Q2. Number of children less than 5 years (0-59 months)? _____

Q3. Sex of household head[2]?   1=Male   2=Female

Q4a Are you hosting any recently (in the last 6 months) internally displaced persons?   1= Yes 2= No   **Q4b**   If yes, Number of persons _____

Q5a Does household have mosquito net? _____ 1= Yes   2= No   **Q5b.**   If yes, ask to see the net: _____   1= GFSOM label 2=Other type   3= Not seen

Q6.   What is the household's <u>main</u> source of income?   1= Animal & animal product sales   2= Crop sales/Farming   3= Trade   4= Casual labour

5= Salaried/wage employment   6= Remittances/gifts/zakat 7=Others, specify _____

Q7-15   Feeding and immunization status of children aged 6 – 59 months (or 65 – 109.9 cm) in the household.

First Name	Q7 Age (months) (if child is more than 24 months old, **skip to Q13**)	Q8 (If 6-24 months) Are you breastfeeding[3] the child? (if no, skip to Q10) 1=Yes 2= No	Q9 (If 6-24 months) If breast feeding, how many times/day? 1=2 times or less 2=3-6 3=On demand	Q10 (If 6-24 months) 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	Q11 (If 6-24 months 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.	Q12 (If 6-24 months) How many times do you feed the child in a day (besides breast milk)? 1= 1 time 2=2-3 times 3=-4 times 4= 5 or more times	Q 13 Has child been provided with Vitamin A in the last 6 months? (show sample) 1=Yes 2= No	Q14 (If ≥9 months old) Has child ever been vaccinated against measles? 1=Yes 2= No	Q15 Has the child ever been given polio vaccine orally? 1=Yes 2= No
1									
2									
3									
4									

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[1] *Number of persons who live together and eat from the same pot at the time of assessment*

[2] *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.*

[3]*Child having received breast milk either directly from the mothers or wet nurse breast within the last 12 hours*

Q16-27 Anthropometry and morbidity for children aged 6 – 59 months or (65 – 109.9cm) in the household

First Name *Follow same order as per table on page 1* *1= Female*	Age (months)	Q16 Sex 1=Male 2=Female	Q17 Oedema 1=yes 2= No	Q18 Height (cm) *To the nearest one tenth)*	Q19 Weight (kg) *To the nearest one tenth)*	Q20 MUAC (cm) **(Only if >11 months)** *To the nearest one tenth)*	Q21 Diarrhoea[4] in last two weeks 1= Yes 2= No	Q22 Serious ARI[5] in the last two weeks 1=Yes 2= No	Q23 Febrile illness/ suspected Malaria[6] in the last two weeks 1=Yes 2= No	Q24 **(If ≥9 month)** Suspected Measles[7] in last one month 1=Yes 2= No	Q25 Did child sleep under a mosquito net last night? 1=Yes 2= No	Q26 Where did you seek healthcare assistance when child was sick? **(If yes in Q21 – 24)** 1=No assistance sought 2=Own medication 3=Traditional healer 4=Private clinic/ Pharmacy 5= Public health facility	Q27 Which of the following programs has the child benefited from? 1= SFP 2= TFC 3= OTP/C 4= Other 5= None
1													
2													
3													
4													

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

Sno	Name	Age (years)	Received Tetanus vaccine? 1= Yes 2= No	MUAC (cm)	Physiological status 1=Pregnant 2= Non pregnant	Illness in last 14 days? If yes, what illness?
1	*Mother:*					

Codes for adult illnesses
2= None   1= ARI 2=Diarrhoreal   3=Malaria/febrile 4=Joint   5=Urinal 6=Organ   7=Anaemia 8= Reproductive 9=Other, specify

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[4] Diarrhoea is defined for a child having three or more loose or watery stools per day
[5] *ARI asked as oof wareen or wareento. The three signs asked for are cough, rapid breathing and fever*
[6] *Suspected malaria/acute febrile* illness: - the three signs to be looked for are periodic chills/shivering, fever, sweating and sometimes a coma
[7] *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*

26

Q 29 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* *2= No*	*Codes:* 1= Own production 6=Borrowed 2=Purchases 7=Gathering/wild 3=Gifts from friends/ relatives 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)?*		
Q30 In general what is the <u>main</u> source of staple food in the household? *(*Use codes in 29 above)* _____		
Q31 Total number of food groups consumed in the household: _____		

Q32   How many meals[8] has the household had in the last 24 hours (from this time yesterday to now)?   1= One   2=Two   3= Three

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[8] *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*

Q33-38 Access to water (quality and quantity)

Q33a   What is the household's main source of drinking water?   1 = Tap/ piped water   2= Tanker truck   3= Tube well/ borehole   4= Spring   5=
Bottled water   6= rooftop rainwater 7= Surface water (river, stream, dam, pond, open well; water catchments; berkad, etc)

Q33b   What is the household's main source of water for other domestic uses? _____ *(Use codes in **Q33a** above)*

Q34a Is drinking water drawn from a protected/safe source?   1= Yes   2= No

Q34b If household has no access to safe protected water what is the main reason?   1= Not Available 2= Distance too far   3= Security Concerns   4=
Cannot afford

Q34c Do you get a reliable supply of drinking water from this source?   1= Reliable supply   2=Seasonal supply   3= Occasional problems   4=
Frequent problems

Q35   Is water treated at the: **a)** source?   1= Yes   2= No   **b)** storage level?   1= Yes   2= No

Q35c If treated, what is the method of treatment?   1= Boiling   2= Chlorination   3= straining/filtering   4= Decanting/ letting it stand and settle   5=
Other, specify

Q36 Average time taken to and from the nearest water point *(including waiting and collecting time)* 1= <30 min   2=30 – 60 min   3= 1-2 hrs   4= more than
2 hrs

Q37 Number of water collecting and storage containers of 10-20 litres in the household: 1=1-2 containers   2= 3-4 containers   3=4-5 containers 4=
more than 5

Q38 How is water stored in the household?   1= Clean containers with cover   2= Closed plastic containers   3= open buckets/ pans   4=   *Ashuun*   *(*with
*c*onstricted neck/end)

Q39-43 Sanitation and Hygiene (access and quality)

Q39a Type of toilet used by most members of the household   1= Bush/open ground   2= Traditional pit latrine/ Open pit   3= Ventilated Improved pit latrine (VIP)
    4= Flush toilets

Q39b   If household has no access to sanitation facility, what is the main reason?   1= Pastoral/ frequent movements   2= Lack resources to construct   3=
Doesn't see the need

Q40 Distance between latrine and water source (if underground or surface source)   1=1- 30 metres   2=30 metres or more

Q41 How many households share/use the same facility?   1= One   2= 2- 9   3= 10 or more

Q42 What key times do you maintain hygienic hand washing practices   1= before eating 2= before preparing food 3= before feeding the baby   4=   after
    cleaning the baby's bottom   5= after defecation   6 = None /Not applicable

Q43 What substance do you use in your household for washing utensils, hands; body and clothes?

 1= Soap/Shampoo   2= Sand   3= Ash   4= Plant extracts 5= None   _____

APPENDIX 2: MORTALITY QUESTIONNAIRE JUNE 2008 BAKOOL AGROPASTORAL NUTRITION ASSESSMENT

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

No.	1: First Name	2: Sex *(1=M; 2=F)*	3: Age (yrs)	4: Born since __ / 03/ 2008	5: Arrived since __ / 03/ 2008	6: Reason for leaving	7: Cause of death
a) How many members are present in this household now? List them.							
b) How many members have left this household (out migrants) since **March __, 2008**? List them							
c) Do you have any member of the household who has died since **March __, 2008**? List them							

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 6= Anaemia
2= ARI 7= Birth complications
3= Measles 8= Accident/ killed/ physical injuries
4= Malaria 9= Hunger/starvation
5= STD/ HIV/AIDS 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: Calendar of Events Bay Agro- pastoral Assessment November 2007

Month	Events	2002	2003	2004	2005	2006	2007
Jan.	Beginning of Jiilal		58 Arafo/Dul-Xaj	46 Arafo/Dul-Xaj	34 Arafo/	22 Arafo/Dul-Xaj	10
Feb	Mid of Jiilaal		57 Sako	45 Sako	33 Sako	21 Sako Imatinkii Dowlada ee Baidoa	9
Mar.	End of Jiilaal		56 Safar	44 Safar	32 Safar	20 Safar	8
Apr.	Beginning of Gu'		55 Mawliid	43 Mawliid	31 Mawliid	19 Mawliid	7 Waqtiga Xaarkii
May	Mid of Gu'		54 Malmadoone	42 Malmadoon	30 Malmadoon	18 Malmadoo	6
Jun.	End of Gu'		53 Jamadul-Awal	41 Jamadul-Awal	29 Jamadul-Awal Dagaalkii Ato/Lahelo	17 Jamadul-Awal	5
Jul.	Beginning of Xagaa		52 Jamadul-Akhir	40 Jamadul-Akhir	28 Jamadul-Akhir	16 Jamadul-Akhir Dhimashadii Abdala Derow	4
Aug.	Mid of Xagaa		51 Rajab	39 Rajab	27 Rajab	15 Rajab	3
Sep.	End of Xagaa		50 Shacbaan	38 Shacbaan	26 Shacbaan	14 Shacbaan Qaraxii baarlamaanka	2
Oct.	Beginning of Deyr		49 Ramadaan	37 Ramadaan Hubeer iyo Yantaar Dagaalkodi Idale	25 Ramadaan	13 Ramadaan	1
Nov.	Mid of Deyr		48 Soonfur	36 Soonfur	24 Soonfur	12 Soonfur	
Dec.	End of Deyr	59 Siditaal	47 Siditaal	34 Siditaal	23 (Digalki Maxakimta iyo Dowlda Siditaal	11 Siditaal	

Jiilaal
GU'
Xagaa
Deyr

Appendix 4: Clusters Sampled for the assessments in Bakool Region
Clusters for Bakool Agropastoral

Distric	Geographical unit	Population size	Assigned cluster
Tieglow	Tieglow	14070	1,2,3
Tieglow	Medaa	1950	4
Tieglow	Hawal Kuule	400	5
Tieglow	Dheemi	1500	6
Tieglow	Barkhadle	200	7
Tieglow	Elgaras	4000	8
Tieglow	Ukunle	300	9
Tieglow	Abiqdheeri	300	10
Tieglow	Warkulun	650	11
Tieglow	Wariyey	725	12
Rabdure	Lahelow	750	13
Rabdure	Imilow	1000	14
Rabdure	Warjiri	145	15
Rabdure	Booci	700	16
Huddur	Huddur	20665	17,18,19,20
Huddur	Faratiyow	605	21
Huddur	Fajeer	500	22
Huddur	Afgoye	700	23
Huddur	Qaxootigi Disay	345	24
Huddur	Beerwaqle	465	25
Huddur	Ered	150	26
Huddur	Busley	400	27
Huddur	Lukugurow	595	28
	Please note that in Bakool 30 households will be covered from 28 clusters		

Sampling Indicators/variables	
	Bakool Agropastoral
U5 population	29,267
Estimated GAM	15
Desired Precision	3.5
Design Effect	1.5
No of children	592
Mean HH size	6
% U5s	20
% HH non response	2
No of HHs	**699**
Population Size	146,335
Estimated CMR	0.5
Desired Precision	0.3
Design Effect	1.5
Recall Period (days)	90
Population to survey	3557
Households to survey	741
No of clusters	28
No of HHs per cluster	30

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: _____

Appendix 6.   Assessments Quality checks

Quality checks	Bakool agro-pastoral Livelihood Zone Nutrition assessment	
	Flags	Score
Missing/ flagged data (WHZ)	Incl	0 (0.6%)
Overall sex ratio (M/F)	incl	0 (p=0.792)
Overall age distribution(Age ratio of 6-29 to 30-59 months)	Incl	0 (p=0.916)
Digit preference-weight	Incl	0 (5)
Digit preference-height	Incl	4 (11)
SD of WHZ	Excl	0 (p=1.02)
Skewness of WHZ	Excl	0(-0.02)
Kurtosis of WHZ	Excl	0 (0.01)
Poisson dist WHZ	Excl	0
OVERAALL SCORE WHZ		4%
At the moment the overall score of this survey is 4%, this is good		

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