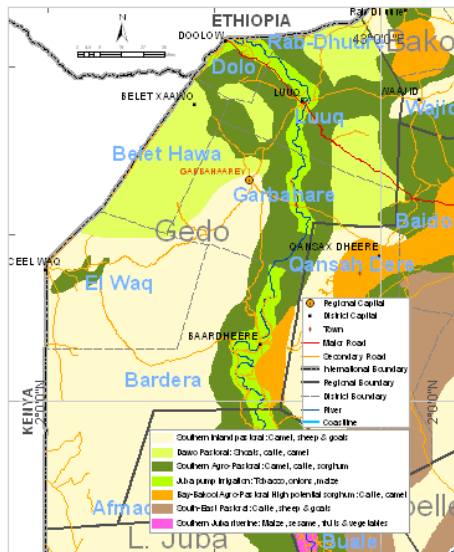


NUTRITION ASSESSMENT REPORT

GEDO PASTORAL, AGROPASTORAL AND RIVERINE LIVELIHOOD SYSTEMS GEDO REGION, SOMALIA

Food Security Analysis Unit (FSAU/FAO)
United Nation Children Funds (UNICEF)
Gedo Health Consortium (GHC)
Co-operatione Di Sviluppo Internazionale (COSV)



APRIL 2007



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We are also grateful to the local authorities, parents/care takers, community guides and the community as a whole for their cooperation, time and provision of information individually and in focus group discussions that helped the assessment team get a better understanding of the nutrition situation in the area.

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EXECUTIVE SUMMARY

In April 2007, FSAU, UNICEF, GHC, COSV and SRCS conducted an inter-agency nutrition assessment in Gedo Region (with exception of Bardera town) in South Somalia. This was in response to the need to determine the malnutrition levels 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 and mortality rate in the specific livelihood systems in the region.

Given the constraints in the region related to security, logistics and personnel, a range of assessment coverage options were explored. Existing information suggested that nutrition situation estimates were already critical, that different parts of the region had different sources of livelihoods and that the overall context in areas outside Bardera town had many similar characteristics. The assessment was therefore designed to include three main livelihoods zones - pastoral, agropastoral and riverine in all areas of the region with the exception of Bardera town for which a separate (urban) assessment would be conducted.

Using a two-stage cluster sampling methodology, a total of 2735 children (899 from pastoral, 928 from agropastoral and 908 from riverine livelihoods) aged 6-59 months and with height of 65-109.9 cm from 1305 households (403 from pastoral; 464 from agropastoral and 438 from riverine livelihoods) with a mean household size of 6.2 (± 2.2) persons were examined. The mean number of the under fives per household was 2.2 (SD=0.8).

The global acute malnutrition (GAM) rate (weight for height < -2 Z score or oedema) was **19.9%** (CI 16.3 – 23.5) and severe acute malnutrition (weight for height < -3 or oedema) was **2.6%** (CI: 1.3-3.8) among the pastoral livelihood. A GAM of **17.7%** (CI: 14.1-21.3) and SAM of **3.5%** (CI: 1.9 – 5.1) was recorded among the riverine livelihood. Agropastoral livelihood recorded the lowest malnutrition rate (point prevalence) with a GAM of **16.7%** (CI: 13.1 -20.3) and SAM of 3.1 (CI: 1.7 – 4.5). No cases of oedema were recorded during the three assessments. The crude and U5 mortality rates were 1.05 (0.51-1.60) and 1.48 (0.22-3.18) respectively among the pastorals. Similar CMR and U5MR rates of 1.09 (0.50 -1.67) and 1.63 (0.68 – 2.57) respectively were reported in the riverine livelihood. Among the agropastoral CMR of 1.53 (0.75 – 2.30) and U5MR of 2.65 (1.11-4.18) were reported.

The nutrition situation in Gedo region continues to be critical levels (GAM of 15.0 -19.9%) in the three livelihood zones. The confidence interval ranges overlap through all three studies, showing that there is no statistically significant difference in the rates of acute malnutrition between the three livelihood zones. However, integrated analysis indicates some improvement from the previous assessment when GAM of 23.8% (CI: 21.1-26.7%) and SAM of 3.7% (CI: 0.8-2.5) with fourteen cases of oedema were recorded. The crude mortality rates for the three assessments were above the emergency threshold of *1/10,000/day* indicating a concerning situation again similar to the mortality situation from the previous assessment in March 2006. For the under five year mortality rate only the results for the Agropastoral population indicated alert levels with the other two at acceptable levels.

High dietary diversity was reported with between 72 and 92% of the households reported to have consumed four or more food groups in the previous 24 hours. Improved milk consumption (84-92%) and recent supplies of cereals, pulses and oil in addition to own sorghum production could have contributed to improved dietary diversity and by extension to the slight improvement in the nutrition status. Even though the majority of the assessed households reportedly sourced their food through purchase (>64%), a significant proportion obtained their staple cereals through food aid (29-35%) and own production (17-57%). Increased sourcing of staple food through own production especially of milk by pastoralists and cereals by agropastoral or riverine populations is an indicator of an improving food security situation.

Overall, the assessment revealed high levels of morbidity in Gedo region where over 30% of the assessed children were reported to have suffered from a communicable illness in the two weeks prior to the assessment. Diarrhoea (>16%) and malaria were possible aggravating factors to the nutrition situation. An outbreak of acute watery diarrhoea (AWD) was reported during the assessment period with a total of 1793 cases and claiming 45 deaths. Further a rapid diagnostic test for malaria conducted concurrently in the region reported a prevalence of **19.7%** among the Gedo population. Analysis showed strong significant association between malnutrition and morbidity rates with children who had been ill in the two weeks prior to the assessment were more likely to be malnourished ($p<0.05$).

Immunization coverage for measles (86.1% in pastoral; 71.4% in riverine), polio (93.5% in pastoral, 79.8% in agropastoral and 94.7% in riverine) and Vitamin A supplementation (76.6% in pastoral, 70.9% in riverine) may have mitigated the adverse effects of morbidity on nutrition situation in the region. Measles vaccination coverage for eligible children (9-59 months old) was however very low at only 29.7% as was coverage for Vitamin A supplementation (31.8%) in the assessed agropastoral populations. Coverage for all these health programmes fell below the recommended 95% level (Sphere, 2004) in all the three livelihoods.

Insecurity, unemployment, stressed livelihoods, poor child feeding practices and poor access to health services remain the main underlying causes of malnutrition in Gedo region. It should be emphasised that, in spite of this evidence of a slight recovery, the results continue to highlight that **the rates of acute malnutrition in Gedo have been and still remain at unacceptable levels for over 12 years**. 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.

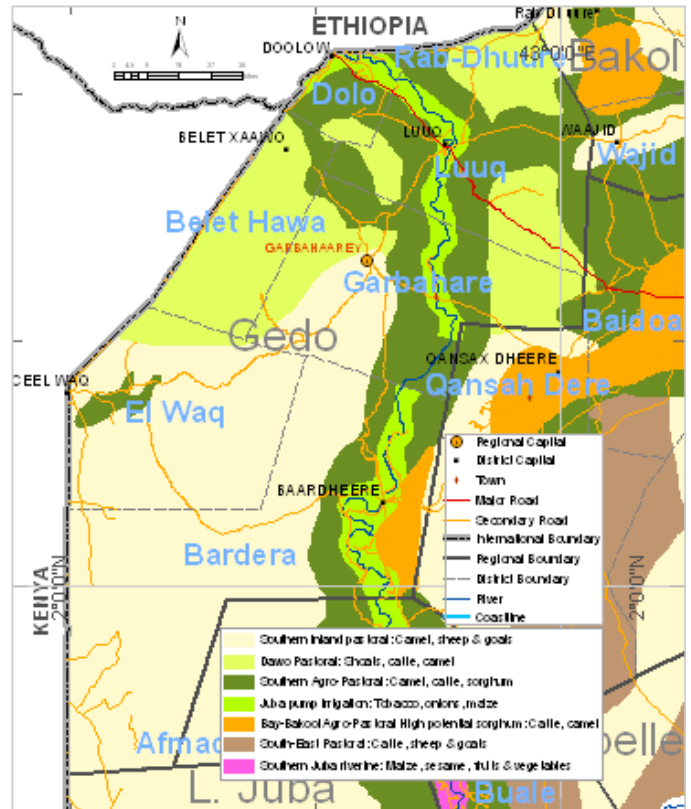
SUMMARY OF THE FINDINGS						
Indicator	Pastoral		Agropastoral		Riverine	
	N	%	N	%	N	%
Total number of households surveyed	403	100	464	100	438	100
Mean household size	6.5	SD=2.2	5.7	SD=2.1	6.3	SD=2.3
Total number of children assessed	899	100	928	100	908	100
Child sex: Males (boys) Females (girls)						
Global Acute Malnutrition (WHZ<-2 or oedema)	179	19.9 (16.3-23.5)	155	16.7 (13.1-20.3)	161	17.7 (14.1-21.3)
Severe Acute Malnutrition (WHZ<-3 or oedema)	23	2.6 (1.3-3.8)	29	3.1 (1.7-4.5)	32	3.5 (1.9-5.1)
Oedema	0	0	0	0	0	0
Global Acute Malnutrition (WHM<80% or oedema)	125	13.9 (10.6-17.2)	94	10.1 (7.4-12.9)	103	11.3 (8.7-14.0)
Severe Acute Malnutrition (WHM<70% or oedema)	7	0.8 (0.3-1.3)	12	1.3 (0.4-2.1)	5	0.6 (0.0-1.1)
Proportion of malnourished pregnant women (MUAC≤23.0; N=115).	25	19.7 (N=127)	30	36.6 (N=82)	11	10.2 (N=108)
Proportion of severely malnourished pregnant women (MUAC≤20.7)	7	5.5	11	13.4	7	6.5
Proportion of children with diarrhoea in 2 weeks prior to assessment	202	22.5 (19.8-25.4)	173	18.6 (16.2-21.3)	151	16.6 (14.3-19.2)
Proportion of children with ARI within two weeks prior to assessment	253	28.1 (25.2-31.2)	152	16.4 (14.1-19.0)	134	14.8 (12.5-17.3)
Children with suspected malaria in 2 weeks prior to assessment	167	18.6 (16.1-21.3)	101	10.9 (9.0-13.1)	84	9.3 (7.5-11.4)
Suspected measles within one month prior to assessment	33	3.8 (2.7-5.4)	13	1.5 (0.8-2.6)	35	4.1 (2.9-5.7)
Children (9-59 months) immunised against measles	748	86.1 (83.6-88.3)	259	29.7 (26.7-32.9)	613	71.4 (68.2-74.3)
Children who have ever received polio vaccine	841	93.5 (91.7-95.0)	741	79.8 (77.1-82.4)	860	94.7 (93.0-96.0)
Children who received vitamin A supplementation in last 6 months	689	76.6 (73.3-79.3)	295	31.8 (28.8-34.9)	644	70.9 (67.8-73.8)
Proportion of households who consumed ≤3 food groups	31	7.7 (5.4-10.9)	58	12.5 (9.7-15.9)	124	28.3 (24.2-32.8)
Proportion of households who consumed ≥4 food groups	372	92.3 (89.1-94.6)	406	87.5 (84.1-90.3)	314	71.7 (67.2-75.8)
Proportion of children 6-24 months who are breastfeeding	136	50.6 (44.4-56.7)	175	58.9 (53.1-64.6)	140	47.9 (42.1-53.8)
Under five Death Rate (U5DR) as deaths/10,000/ day		1.48 (0.22-3.18)		2.65 (1.11-4.18)		1.63 (0.68-2.57)
Crude Death Rate (CDR) as deaths/10,000/ day		1.05 (0.51-1.60)		1.53 (0.75-2.30)		1.09 (0.50-1.67)

1.0 Introduction

Gedo region is located in southwest Somalia and comprises of six districts namely:- Luuq, Bellet Hawa, Dolow , Garbaharey, Elwak and Bardera districts with an estimated population size of about 328,378¹. The region is located along the border of Kenya to the West, Ethiopia to the Northwest, Bakol to the North East, Middle Juba to the South, Bay to the East. Garbahare is the regional headquarter of Gedo. The region has five distinct livelihood zones: Bay-Bakool Agropastoral; Dawo Pastoral; Juba Pump Irrigation Riverine; Southern Inland Pastoral, and Southern Agropastoral (see map 1). Following the collapse of the Somali Central Government in 1991, Gedo has been faced with a series of disasters, both natural (floods and droughts) and man-made (poor governance, sporadic armed conflict and widespread human rights abuses).

This series of shocks with limited opportunity to recover between the shocks has led to a chronic emergency situation for a large part of the Gedo population. Seasonal Post Gu and Post Deyr assessments by FSAU have indicated a sustained IPC Phase 3 (Acute Food and Livelihood Crisis) or 4 (Humanitarian Emergency)² for over 3 years.

Although the numbers of affected population in Humanitarian emergency have reduced over the last one year following successive average to above normal rainy seasons and intervention efforts, other underlying vulnerabilities has prevented any significant recovery in the nutrition situation.

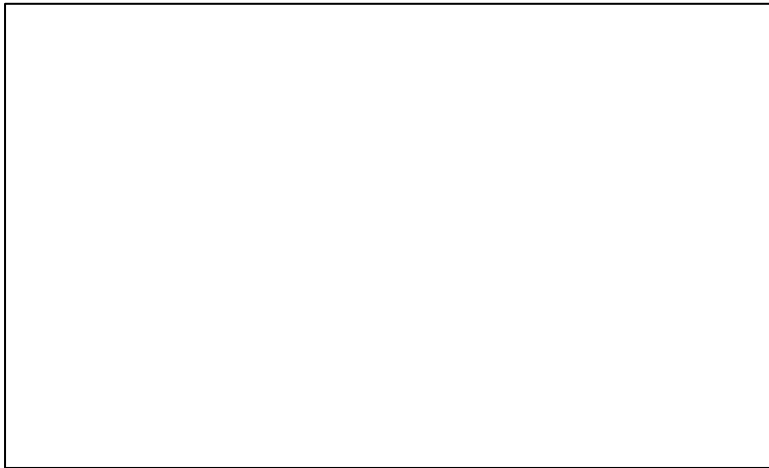


¹ UNDP Population estimates, August 2005

² FSAU IPC Phase Classification 2004-2007 series

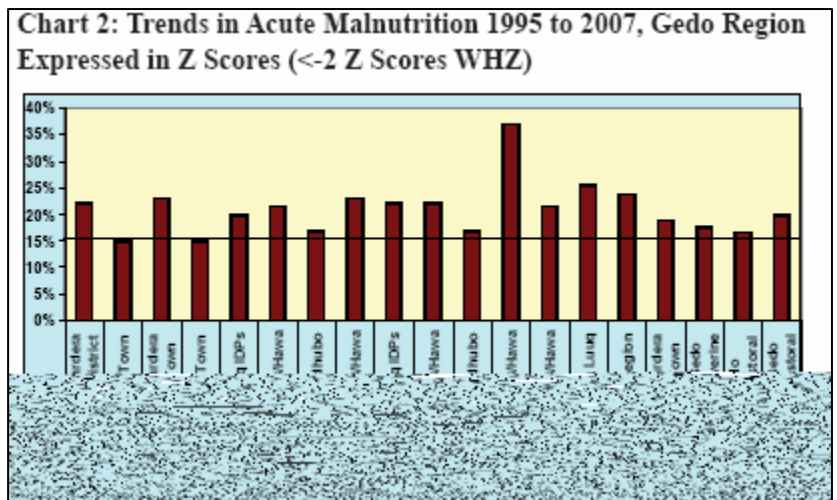
Nutrition situation:

Nutrition assessments conducted in Gedo Region in 1980 -1996 indicate varied levels of Global Acute Malnutrition (³WHM< 80% or oedema) indicating a severe deterioration with a GAM of 38% in January 1993 (Bardera) and 37% in July 1996 (Belet Hawa). See *Chart 1*. One important point to note is that prior to 1992, all nutrition surveys conducted estimated prevalence of acute malnutrition based on *percentage of the reference median*. The concept of z scores, which estimated prevalence of acute malnutrition based on standard deviations from the mean reference, was introduced by WHO in 1992. Therefore the application of >15% Global acute malnutrition threshold to classify an emergency nutrition situation is only relevant for nutrition assessments conducted using the Z scores. The timing and location of the



nutrition assessments preset are not directly comparable, however, these trends from 1980 to 1996 are very useful in highlighting a more stable nutrition situation in the 1980s with extremely high levels recorded in some parts of the region following the collapse of the government and subsequent conflict.

The use of Z scores to estimate acute malnutrition was introduced in Somalia in 1995 by Action Contre La Faim (ACF). Nutrition assessments conducted since 1995 and analyzed using Weight for Height Z scores (WHZ) indicates a continued grave situation. The trends (*Chart 2*) illustrate the persistence of a critical nutria with GAM>15%, the emergency threshold being reported throughout the period. However, it is not possible to directly compare the assessment results reporting prevalence of acute malnutrition in % of median (WHM) and Z Scores (WHZ) as different estimates on the same population will be recorded. Therefore chart 1 and chart 2 cannot be directly compared.



³ Weight for Height Percentage of Median

In the historical time line of events below, the aggravating factors to the sustained critical nutrition situation are highlighted.

Historical Timeline of Events In Gedo and Their Contribution to The Sustained Critical Nutrition Situation		
Year	Events And Underlying Causes of Malnutrition	Implications on the Nutrition Situation in Gedo Region
1991	<ul style="list-style-type: none"> • Collapse of the Somalia Central Government and with it, governance problems and sporadic armed conflict in Gedo Region. This led to widespread human rights abuses, impacted negatively on livelihoods, and access to food security and health care services. • Drought and famine in the South and Central. Lack of rain and pastures contributed to livestock deaths (lack of milk and milk products for consumption) and crop failure. • Massive displacement of people within Somalia and into refugee camps in Kenya. 	Nutrition data not available
1992 early 1993	<ul style="list-style-type: none"> • Al-Lihad Forces present in Gedo • ‘Operation Restore Hope’ (comprising of American Troops etc) commences in December 1992 • Drought and Famine in the South. Total collapse of livelihoods – Lack of rain and pastures contributed to livestock deaths (lack of milk and milk products for consumption) and crop failure. • FSAU Baseline Profiles classifies 1992 as a ‘bad year • Trocaire commences food distribution in Mogadishu and emergency health care (SFP/TFP, food aid, EPI, rehabilitation of health facilities, water and sanitation, agriculture) in Gedo in September 	<ul style="list-style-type: none"> • Massive starvation in the South • Jan '93 Bardera Nutrition Assessment [by CDC, UNICEF, CPHS]: GAM (WHM<80% or oedema) 38%
Mid – End 1993	<ul style="list-style-type: none"> • UNOSOM Takes over from ‘Operation Restore Hope’ in May; Al Lihad forces did not recognize UNOSOM • Humanitarian Food Assistance commences • Good harvest and livestock in good condition • FSAU Livelihood Profile: A Normal-Good year 	No data
1994	<ul style="list-style-type: none"> • UNOSOM in Somalia • The EC launches its first rehabilitation program in Somalia • The SACB established to coordinate humanitarian response in Somalia • WFP commences Food for work projects • Medium rains, pasture available and livestock conditions good, prices normal • FSAU Baseline Profile: Normal year 	October 1994 Garbaharey Nutrition Assessment [by UNICEF]: GAM (WHM<80%]: 6.0%
1995	<ul style="list-style-type: none"> • UNOSOM withdraws from Somalia, however peace and order not yet in place • Low food stocks • Ethiopian troops invade Gedo • Gu & Deyr failure • Poor livestock production • FSAU Baseline Profile: A bad year 	AICF Nov 1995 Bardera Town, Rural Areas, IDPs Nutrition Assessment: GAM: 17% (WHM < 80%)
1996	<ul style="list-style-type: none"> • The South is classified as an Emergency zone by the UN Appeal for 1996/97 • Bay Bakool IDPs in Luuq • Somali National Front (SNF) captured • Good crop and livestock condition • FSAU Baseline Profile: A good year 	Trocaire, Amref, Memisa July 1996 Bulahawa Nutrition Assessment: GAM 37% (WHM < 80%)
1997	<ul style="list-style-type: none"> • El-Nino Floods • Malaria outbreak • Excessive rains leading to good pasture and fodder • Livestock production good, but high camel death • Bula Hawa Hospital opened by Trocaire in December • FSAU Baseline Profile: Bad year 	No data
1998	<ul style="list-style-type: none"> • Rift valley fever outbreak • Livestock ban imposed by Saudi government • Pasture and water availability normal 	No data

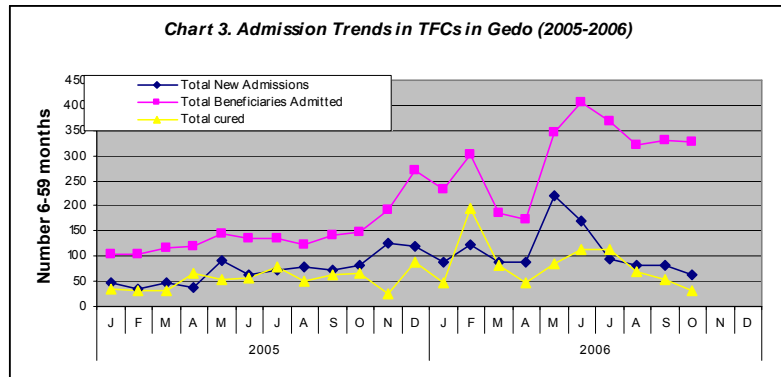
	<ul style="list-style-type: none"> High levels of pregnancy (and anaemia) related maternal deaths reported in 8 health posts FSAU Baseline Profile: A normal year 	
1999	<ul style="list-style-type: none"> Poor rains, low livestock prices and high cereal prices Unusual out-migration of livestock Displacement Inadequate humanitarian food assistance A cholera outbreak reported in Bardera with 200 deaths out of 2000 cases FSAU Baseline Profile: A bad year 	UNICEF Dec 1999 Bardera Town Nutrition Assessment: GAM 23% (WHZ < -2 or oedema)
2000	<ul style="list-style-type: none"> Security conditions better than usual Humanitarian food assistance provided Good livestock condition at favourable market prices A joint Assessment conducted in Gedo by a UN Mission (led by FSAU/UNCU estimates 74-97,000 people to be food insecure in parts of Gedo with the situation likely to deteriorate FSAU Baseline Profile: A Normal year Gedo Health Consortium is formed Livestock ban imposed due to RVF by the gulf countries 	<ul style="list-style-type: none"> ACF April 2000 Luuq Town Nutrition Assessment: GAM 8.8% (WHZ < -2z or oedema) ACF Luuq IDPs Apr 2000 Nutrition Assessment: GAM 14.9% (WHZ < -2 or oedema) UNICEF May 2000 Belet Hawa Nutrition Assessment: GAM 21.5% (WHZ < -2 or oedema) UNICEF September 2000 Burdhubo Nutrition Assessment: GAM 15% (WHZ < -2 or oedema)
2001	<ul style="list-style-type: none"> FSAU Baseline Profile: A Bad year Formation of the Gedo Health Consortium (of three agencies Trocaire _ Lead agency, AMREF, CORDAID) in April 2001; supporting 3 hospitals, 5 out-patient departments, 3 TB treatment centers and 36 health posts in 5 districts (Burdhubo, Garba Hare, Bula Hawa, Dolow and Luuq). 	FSAU/UNICEF/CARE/GHC Belet Hawa Dec 2001 Nutrition Assessment; 37.1% GAM (WHZ < -2 or oedema)
2002	<ul style="list-style-type: none"> Failed Gu and Deyr rains Out-migration of livestock Fighting broke out in Luuq in October and left about 100 dead or injured; increased tension in Gedo Significant loss of assets especially in the poor wealth groups FSAU Baseline Profile: A Very Bad year A diarrhoea outbreak reported in Garba hare paediatric Hospital GHC commences therapeutic and supplementary feeding programs in January in Bula Hawa and Garba Hare districts 	FSAU/GHC/CARE/WHO Belet Hawa Oct 02 Nutrition Assessment: 21.7% GAM (WHZ < -2 or oedema)
2003	<ul style="list-style-type: none"> Gu rains commence in Mid April in Gedo, water and pasture become available High cost of imported foods (associated with transport problems with roads having been blocked by the heavy rains) Poor households from all livelihood zones in Northern Gedo have limited assets and income options and therefore face difficulties in accessing food General food distribution by CARE Therapeutic and supplementary feeding programs by GHC on-going in Bula Hawa and Garba Hare districts FSAU Monthly report May 2003: The overall food security situation is 'Below Normal' and not expected to improve till Gu 2004 	<p>No Nutrition Assessment conducted</p> <p>FSAU Rapid assessment in Burdhubo Town indicates 13.5% with MUAC < 12.5 cm (N=67 children aged 12-59 months) in October</p>
2004	<p>FSAU Post GU'04 Analysis):</p> <ul style="list-style-type: none"> 52,100 people in Gedo faced with a Humanitarian emergency and 58, 200 with a livelihood crisis due to chronic and on-going civil insecurity and drought Therapeutic and supplementary feeding programs by GHC on-going in Bula Hawa and Garba Hare districts 	FSAU/UNICEF/SRCS Luuq Oct 2004 Nutrition Assessment GAM % 25.4
2005	<p>FSAU Post Deyr'05/06 Analysis)</p> <ul style="list-style-type: none"> FSAU: A Humanitarian Emergency in Gedo Region with moderate risk to Famine Northern Gedo (Belet Hawa, Dolo and Luuq) in a 'Sustained Humanitarian phase for preceding 3 years Pasture and water severely depleted 20-30% of cattle in Gedo have died due to lack of pasture, water and drought related diseases 	No assessment conducted

	<ul style="list-style-type: none"> Pastoralists engaged in distress coping strategies including abnormal migration, inducing still births to save breeding stock etc Therapeutic and supplementary feeding programs by GHC on-going in Bula Hawa and Garba Hare districts 	
2006	<p>FSAU Post Gu'06 Analysis categorizes</p> <ul style="list-style-type: none"> 160,000 in Gedo as faced with a Humanitarian Emergency and 69,000 in an Acute Food and Livelihood Crisis Water availability, average-good in the south, and poor in the north Pasture conditions average-good Abnormal migration patterns in livestock and humans observed Livestock (cattle and shoats) stock holdings lower than in a normal year Milk production below average Therapeutic and supplementary feeding programs by GHC on-going in Bula Hawa and Garba Hare districts 	<p>FSAU/UNICEF</p> <ul style="list-style-type: none"> March 2006 Gedo Region Nutrition Assessment: 23.8 % GAM (WHZ < -2 or oedema) April 2006 Bardera Town Nutrition Assessment 19.0% GAM (WHZ < -2 or oedema)
Jan 2007	<p>FSAU Post Deyr 06/07 Analysis</p> <ul style="list-style-type: none"> The food, livelihood and nutrition situation for both pastoralists and agro-pastoralists in Deyr (October-December) 06 improves compared to Gu (April-June) 06 The Humanitarian situation in Gedo region's riverine critical and deteriorating due to the compounding impacts of the previous drought and severe flooding in Deyr 06 Milk Production below average Suspected Rift Valley Fever Kenyan border closed to cattle and traders from Gedo Region High conception for all livestock species Acute watery diarrhoea outbreaks Therapeutic and supplementary feeding programs by GHC on-going in Bula Hawa and Garbahare districts 	<ul style="list-style-type: none"> A critical (but improving) situation in Gedo. (Ref: Integrated analysis of the nutrition situation (Ref: Nutrition Situation Estimates Categorization Table) indicates)

A nutrition assessment conducted in March 2006 following a severe drought in 2005/2006 reported a very critical nutrition situation with Global Acute Malnutrition of 23.8% (CI: 21.1 – 26.7). Most recent nutrition sentinel site surveillance data⁴ also indicates that the nutrition situation in Gedo has remained critical with a more worrying situation in the Riverine population than in the Pastoral and Agropastoral populations.

⁴ FSAU Nutrition Update, March 2007

Admission of new cases of severely malnourished children aged 6-59 months into the TFCs in Gedo (Bellet Hawa, Dolo, Garbahare and Luuq) shows a fluctuating trend (See *Chart 3*). A recent introduction of home based care by GHC in 2006 is likely to improve access therapeutic care and reduce admissions to TFCs as already being seen in the chart. However, delivery of these services is often interrupted by insecurity incidences.



Health Situation: Until April 2001, humanitarian services in Gedo Region were mainly provided by Trocaire (in Bula Hawa and Dolo), AMREF (Luuq) and CORDAID (GARBaharey and Burdhubo), who worked directly or through local partnership to provide health and social development services. These agencies have since consolidated into the Gedo Health Consortium (GHC) with a comprehensive management and administrative structure, with programs covering five (out of the six⁵) districts.

GHC supports three hospitals, five outpatient departments, three TB treatment centres and approximately 36 health posts in the five districts. The emergency program, a department in GHC supports malnourished children < 5 years through therapeutic feeding program (with TFCs at Luuq Hospital, Garbaharey and Belet Hawa) which targets severely malnourished children. The programs have been running since January 2002.

⁵ Garbaharey, Bulahawa, Luuq, Bardera, Dolo and El Wak

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 Gedo region.

Specific Objectives were:

1. To determine the prevalence of 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 Gedo region.
2. To determine the level of acute malnutrition among women aged 15-49 years in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.
3. To identify factors influencing nutrition status of the children in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.
4. To determine the prevalence of some common diseases (measles, diarrhoea, febrile illnesses and ARI) and malaria (through RDT) in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.
5. To determine the measles and polio vaccination and Vitamin A supplementation coverage among children in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.
6. To assess child feeding and care practices in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.
7. To determine the crude and under-five mortality rates in the three livelihood groups of Pastoral, Agropastoral and Riverine in Gedo region.

3.0 METHODOLOGY

Three cross-sectional assessments were conducted among the Pastoral; Agropastoral and Riverine populations of Gedo region covering across all the six districts – Belet Hawa, Elwak, Dolo, Garbahare, Luuq and Bardera except Bardera town, which has characteristics distinct from the rest of the region. Bardera town is populous urban settlement and is seen as quite different in terms of vulnerability - better access to remittances, better irrigated farming opportunities; business opportunities and better economic situation and was therefore, excluded from the sample.

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/towns within each of the three assessed livelihoods in the region (except Bardera town), with their respective populations⁶ 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 in Dolo 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.

⁶ Due to lack of UNDP population figures at settlement level, NID polio figures (March 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 1305 households with a mean household size of 6.2 (SD=2.2) persons. A total of 2735 children aged 6-59 months and with height of 65-109.9 cm were assessed. The mean number of the under fives per household was 2.2 (SD=0.8). 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	403	100	464	100	438	100
Household size (Mean):	6.5	SD=2.2	5.7	SD=2.1	6.3	2.3
Mean No of Underfives	2.3	SD=0.9	2.1	SD=0.8	2.1	SD=0.8
Residential Status						
Resident	374	92.8	448	96.6	412	94.1
Internally displaced	17	4.2	13	2.8	25	5.7
Internal Immigrants	11	2.7	3	0.6	1	0.2
Returnees	1	0.2	0	0	0	0
Main source of Income						
Animal and its products sales	216	53.6	46	9.9	121	27.6
Crop sales	0	0	296	63.8	92	21.0
Trade	31	7.7	3	0.6	3	0.7
Casual labour	145	36.0	119	25.6	218	49.8
Salaries/wages	7	1.7	0	0	1	0.2
Remittances	4	1.0	0	0	3	0.7

The results showed that over 92% of the assessed households were local residents with less than 6% being recently displaced. Qualitative information during the time of assessment reported observation of groups of displaced families fleeing from military conflict in Mogadishu. These families joined their relatives in Gedo; some made temporary transit camps in the towns or crossed to the borders of

Ethiopia and Kenya.

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 respectively as expected. However, among the riverine livelihoods, casual labour (49.8%) was the main source of income at the time of assessment (Table 4.1). The riverine population had previously lost large crops cultivated through river flooding in December 2006 and off season cultivation in the farms along the river beds and pump-irrigated farms provided casual labour to the households.

4.2 Health Water and Environmental Sanitation

4.2.1 Water Access and Quality

In the pastoral and agropastoral livelihoods, over 90% of the households assessed drew water from unprotected sources (open wells, rivers and water catchments). Among the riverine population however, about one third (34.4%) have access to protected water sources (tap and protected wells). The average time taken to and from the nearest water points for majority of the households was 30-60 minutes. Less than 43% of the households accessed water within the recommended 30 minutes⁷. The results also showed that most (>80%) of the households owned insufficient number (less than 5) of water storage containers with capacity of 20 litres limiting their capacity to store water (Table 4.2).

⁷ Time taken to and from water source including waiting time (Sphere, 2004).

	Pastoral (N=403)		Agropastoral (N=464)		Riverine (N=438)	
	N	%	N	%	N	%
Source of Water						
Tap/ piped water	2	0.5	0	0	5	1.1
Protected wells	19	4.7	44	9.5	146	33.3
Unprotected wells/sources	382	94.8	420	90.5	287	65.5
Time taken to get water						
<30 minutes	87	21.6	192	41.4	185	42.2
30-60 minutes	149	37.0	240	51.7	226	51.6
1-2 hours	103	25.6	29	6.3	22	5.0
>2 hours	64	15.9	3	0.6	5	1.1
Number of clean water storage containers						
1 - 2 containers	136	33.7	273	58.8	342	78.1
3 - 4 containers	191	47.4	183	39.4	58	13.2
4 – 5 containers	63	15.6	8	1.7	36	8.2
> 5 containers	13	3.2	0	0	2	0.5
Method of Water storage						
Covered containers	138	34.2	207	44.6	336	76.7
Open containers	169	41.9	249	53.7	84	19.2
Constricted neck-end (<i>Ashuun</i>)	96	23.8	8	1.7	18	4.1

High incidences of diarrhoea has been associated with use of water from unprotected sources⁸

4.2.2 Sanitation and Hygiene Practices

The results revealed that the majority of the households in the region had no access to sanitation facilities for human waste disposal especially in pastoral (74.4%) and agropastoral (87.9%) livelihoods and were therefore using the bush. Where available, the commonly used sanitary facility was open-pit latrine. The distribution of the sanitary facilities is shown in table 4.3 below.

	Pastoral		Agropastoral		Riverine	
	N	%	N	%	N	%
Access to Sanitation facility						
Flush toilets	5	1.2	0	0	2	0.5
VIP	5	1.2	2	0.4	139	31.7
Traditional pit latrine /Open pit	93	23.1	54	11.6	51	11.6
No latrine at all (Bush)	300	74.4	408	87.9	246	56.2
Use of washing agent						
Soap	164	40.7	192	41.4	226	51.6
Shampoo	49	12.2	55	11.9	28	6.4
Ash	60	14.9	41	8.8	132	30.1
Plant extract materials	5	1.2	16	3.4	0	0
None	125	31.0	160	34.5	52	11.9
Method of food storage:						
Put in a pot besides fire	90	22.3	110	23.7	176	40.2
Covered container	21	5.2	69	14.9	55	12.6
Suspended in a rope/hooks	8	2.0	5	1.1	13	3.0
Don't store	284	70.5	280	60.3	194	44.3

The results also revealed that except for the riverine livelihood (51.6%) less than half of the surveyed households were using soap. Other washing detergents used included shampoo and ash. Up to 34.5% of the households were not using any washing detergent. On food storage,

most households kept food warm next to fire.

⁸ FSAU Gedo Nutrition Assessment, march 2006

4.2.3 Morbidity, immunization and Health Seeking Behaviour

High morbidity rates were reported in the three livelihoods of pastoral (53.9%); agropastoral (36.5%) and riverine (30.0%) populations of under five children. For the children who fell sick within two weeks prior to the assessment, majority (>50%) sought medical assistance, mostly from

	Pastoral		Agropastoral		Riverine	
	N	%	N	%	N	%
<i>Child fell sick</i>						
Yes	485	53.9	339	36.5	272	30.0
No	414	46.1	589	63.5	636	70.0
<i>Where health service sought</i>						
Public health facilities	234	48.2	22	6.5	163	59.9
Private pharmacy/clinic	113	23.3	123	36.3	53	19.5
Traditional healers	6	1.2	19	5.6	0	0
Own medication	0	0	7	2.1	0	0
No assistance sought	132	27.2	168	49.6	56	20.6

public health facilities (in pastoral and riverine populations). Among the agropastoral populations assistance was mostly sought from private drug shops or clinics (Table 4.4).

The incidence of reported diarrhoea in Pastoral, Agropastoral and Riverine populations (22.5%; 18.6% and 16.6% 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). A rapid diagnostic test for malaria⁹ conducted concurrently in the region reported malaria an overall prevalence of 19.7% for *Plasmodium falciparum* among the sampled population (Table 4.6). Furthermore, an outbreak of cholera (acute watery diarrhoea) was reported during the assessment period with a total of 1793 AWD cases¹⁰ with 45 related deaths reported by end of April.

	Pastoral		Agropastoral		Riverine	
	n	%	n	%	n	%
<i>Incidence of major child illnesses</i>						
Proportion of children with diarrhoea in 2 weeks prior to assessment	202	22.5	173	18.6	151	16.6
Proportion of children with ARI within 2 weeks prior to assessment	253	28.1	152	16.4	134	14.8
Children with suspected malaria in 2 weeks prior to assessment	167	18.6	101	10.9	84	9.3
Children tested positive for malaria (RDT)	115	20.2	98	19.2	98	19.6
Suspected measles within one month prior to assessment	33	3.8	13	1.5	35	4.1
<i>Immunization Coverage</i>						
Children (9-59 months) immunised against measles	748	86.1	259	29.7	613	71.4
Children who have ever received polio vaccine	841	93.5	741	79.8	860	94.7
Children who received vitamin A supplementation in last 6 months	689	76.6	295	31.8	644	70.9

Measles vaccination coverage for eligible children (9-59 months old) was very low at only 29.7% as was coverage for vitamin A supplementation (31.8%) in the assessed agropastoral population. Coverage for all these health programmes fell below the recommended 95% level (Sphere, 2004) in all the three livelihoods.

⁹ Tests using Para checks conducted in collaboration with UNICEF

¹⁰ WHO Acute watery diarrhoea update, May 2007

Table 4.6 Results of the Malaria RDT assessment

	Livelihood						Total	
	Pastoral		Agropastoral		Riverine			
	n	% (CI)	n	% (CI)	n	% (CI)	n	% (CI)
RDT Positive	115	20.2 (11.1 – 29.4)	98	19.2 (7.4 – 31.0)	98	19.6 (5.1 – 34.1)	311	19.7 (12.8 – 26.6)
RDT Negative	444	78.2 (67.9 – 88.4)	409	80.0 (68.3 – 91.7)	402	80.4 (65.9 – 94.9)	1255	79.5 (72.4 – 86.5)
RDT Invalid	9	1.6 (0.0 – 3.7)	4	0.8 (0.0 – 1.8)	0	0.0	13	0.8 (0.0 – 1.7)
Reported fever	271	47.7 (34.6 – 60.8)	69	13.5 (8.2 – 18.8)	99	19.8 (6.4 – 33.2)	439	27.8 (19.2 – 36.4)
Slept under net	169	29.8 (16.1 – 43.4)	44	8.6 (3.6 – 13.6)	126	25.2 (4.7 – 45.7)	339	21.5 (12.4 – 30.5)
Treated for malaria	57	10.0 (1.6 – 18.5)	15	2.9 (0.0 – 6.0)	6	1.2 (0.0 – 2.5)	78	4.9 (1.2 – 8.7)
Total assessed	568	36.0 (18.0 – 53.9)	511	32.4 (15.3 – 49.4)	500	31.7 (14.9 – 48.4)	1579	100

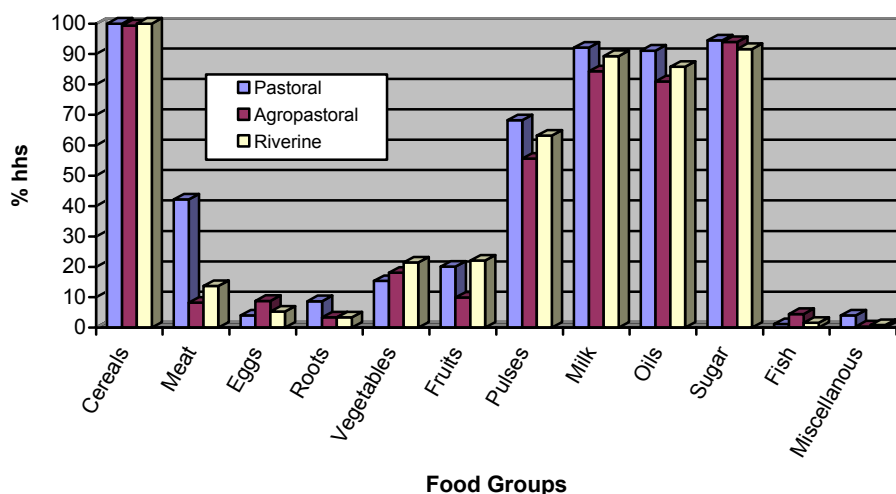
The 79.5% who tested negative for *Plasmodium falciparum* included some 3.6% who had been treated for malaria within two weeks prior to the assessment. A large majority (82.3%) of those who had malaria did not sleep under a mosquito net. Mosquito nets were probably protective against malaria as higher malaria prevalence (20.8%) was reported among those who did not sleep under a bed net than those who had slept under bed net (16.4%), with a relative risk of 1.06 (1.00 < 1.06 < 1.12; p=0.069).

4.3 Household Food Security

4.3.1 Food Consumption

As shown on figure 4.3, 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 (84-92%), oil/fat (81-91%) and sugar as tea (92-95%). Meat consumption was significantly higher in pastoral (42.2%) than in agropastoral (8.2%) and riverine (13.7%) livelihoods. Consumption of other food groups (fruits, vegetables, eggs, roots and fish) were very low in all the livelihoods.

Fig 4.3.1 Distribution of Food Groups Consumed by Households



Even though purchasing is the main households' source of food (64-82%), a significant number of households reported relying on their own production (10-20%). This was unlike in the previous year when almost all (97.4%) of the households surveyed obtained their food through purchasing while the remaining few borrowed (2%) or obtained their food as gifts (0.2%) and only 0.4% produced their own food. This is linked to improved pasture and harvest after good deyr 06/07 rains. However, food aid, still contributed a significant proportion (5-14%) of the households source of food in this assessment (Table 4.7).

Table 4.7. Households main source of food

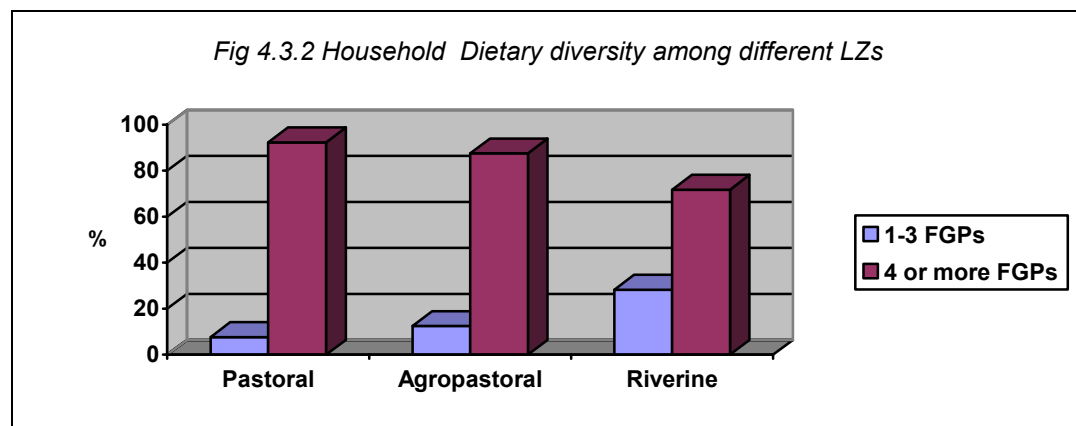
Main source of food	Pastoral		Agropastoral		Riverine	
	%	n	%	%	n	%
Purchasing	331	82.1	297	64.0	282	64.4
Own production	42	10.4	92	19.8	52	11.9
Food aid	20	5.0	66	14.2	34	7.8

4.3.2 Dietary Diversity

Five food groups were the most frequently consumed reported in 31-42% of the households within the same period. Households consumed an average (HDDS) of 5 food groups with the number of food groups consumed ranging from two to ten. As showed in Fig 4.3.2, large majority (72-92%) of the households consumed diversified diets¹¹ in the 24 hours prior to the assessment.

¹¹ Composed of at least four food groups based on a total of 12 FAO food groups.

	Pastoral		Agropastoral		Riverine	
	n	%	n	%	n	%
<i>No. of food groups consumed</i>						
2 food groups	11	2.7	3	0.6	16	3.7
3 food groups	20	5.0	55	11.9	108	24.7
4 food groups	57	14.1	144	31.0	88	20.1
5 food groups	169	41.9	196	42.2	135	30.8
6 food groups	81	20.1	41	8.8	32	7.3
7 food groups	33	8.2	19	4.1	35	8.0
8 food groups	13	3.2	4	0.9	24	5.5
9 food groups	14	3.5	2	0.4	0	0
10 food groups	5	1.2	0	0	0	0
<i>No. Having Diversified Diet</i>						
1-3 food groups	31	7.7	58	12.5	124	28.3
≥ 4 food groups	372	92.3	406	87.5	314	71.7
Mean HDDS	5.3 (SD=1.5)		4.6 (SD=1.1)		4.6 (SD=1.5)	



4.3.3 Formal and informal support

The assessment results revealed between 16-29% of the assessed households in Gedo region had received informal support in forms of remittances from abroad, gifts, zakat from better off households and loans

On the other hand, majority (65.3%; 58.0% and 74.4% in pastoral, agropastoral and riverine respectively) of the assessed households had received formal support mostly in form of food aid. Qualitative information reported food distributions by CARE and WFP in the districts of Gedo in March and early April.

Table 4.9 Formal and Informal support received by households

	Pastoral (N=403)		Agropastoral (N=464)		Riverine (N=438)	
	n	%	n	%	n	%
Informal support						
Received:						
Yes	64	15.9	111	23.9	127	29.0
No	339	84.1	353	76.1	311	71.0
Type of social support						
	N=64		N=111		N=127	
Zakat	16	25.0	20	18.0	13	10.2
Remittances from abroad	8	12.5	2	1.8	8	6.3
Remittances from Somalia	6	9.4	16	14.4	12	9.4
Gifts	25	39.1	8	7.2	10	7.9
Loans	13	20.3	71	64.0	93	73.2
Formal support						
Received:						
Yes	263	65.3	269	58.0	326	74.4
No	140	34.7	195	42.0	112	25.6
Type of formal support						
	N=263		N=269		n=326	
Free cash	4	1.5	0	0	0	0
Food aid	210	79.8	266	98.9	323	99.1
Food for work	3	1.1	2	0.7	4	1.2
Supplementary food	138	52.5	0	0	0	0
Water subsidy	1	0.4	0	0	0	0
Veterinary care	0	0	4	1.5	0	0

4.4 Nutrition Status

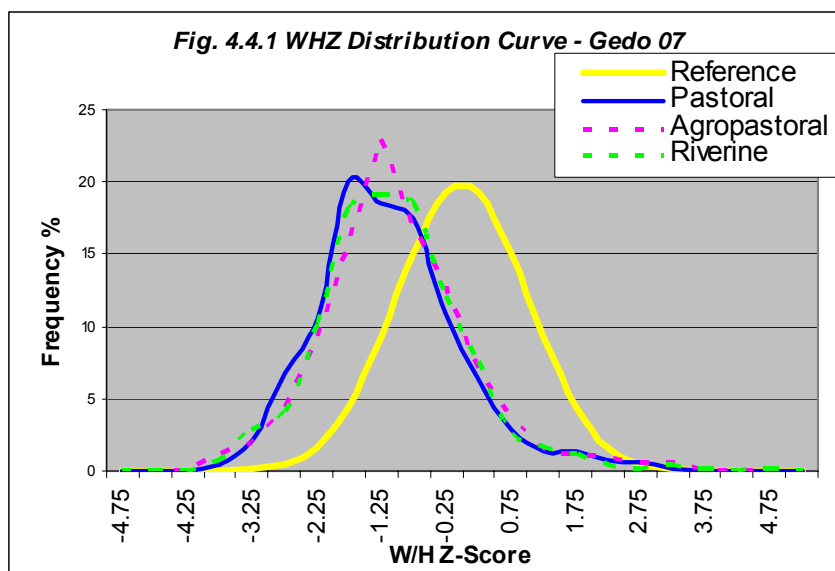
4.4.1 Malnutrition by Livelihoods

A total of 899 children, 52.7% boys and 47.3% girls (sex ratio = 1.12) aged 6-59 months were assessed from 403 households among the pastoral livelihoods (mean household size = 6.5 ± 2.2). In the agropastoral livelihood, 928 children (53.4% boys and 46.6% girls; sex ratio 1.15) were assessed from 464 households (mean household size = 5.7 ± 2.1) while 908 children (49.4% of them boys and 50.6% girls; sex ratio 0.98) were assessed from 438 sampled households. The results shows critical nutrition levels with GAM of 19.9% (16.3 – 23.5); 16.7% (13.1 – 20.3) and 17.7% (14.1 – 21.3) and SAM of 2.6% (1.3 – 3.8); 3.1% (1.7 – 4.5) and 3.5% (1.9 – 5.1) respectively among the assessed pastoral, agropastoral and riverine populations. 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		Agropastoral		Riverine	
	No	% (CI)	No	% (CI)	No	% (CI)
Global Acute Malnutrition (<-2 Z score or oedema)	179	19.9 (16.3-23.5)	155	16.7 (13.1-20.3)	161	17.7 (14.1-21.3)
Severe Acute Malnutrition (<-3 Z score or oedema)	23	2.6 (1.3-3.8)	29	3.1 (1.7-4.5)	32	3.5 (1.9-5.1)
Oedema	0	0	0	0	0	0
GAM (WHM<80% /oedema)	125	13.9 (10.6–17.2)	94	10.1 (7.4-12.9)	103	11.3 (8.7-14.0)
SAM (WHM<70% /oedema)	7	0.8 (0.3 – 1.30)	12	1.3 (0.4 – 2.1)	5	0.6 (0.0 – 1.1)
Stunting (HAZ < -2)	169	18.8 (14.1 -23.5)	217	23.4 (16.4-30.4)	263	29.0 (22.8 -35.2)
Underweight (WAZ < -2)	271	30.1 (24.7–35.6)	283	30.5 (24.4–36.6)	333	36.7 (30.3–43.0)

Overall, the distribution of the weight-for-height scores in the Gedo assessments (mean=-1.07; median=-1.1; SD=1.1) were skewed (skewness=0.76) towards the left depicting a poorer nutrition situation according to international (WHO) standards (Fig 4.4.1). 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)	99	20.9	80	18.8	89	17.9	66	15.3	91	20.3	70	15.3
SAM (WHZ<-3 /oedema)	13	2.7	10	2.4	19	3.8	10	2.3	22	4.9	10	2.2
Oedema	0	0	0	0	0	0	0	0	0	0	0	0

About 21% of boys and 19% of girls were acutely malnourished in the surveyed population using weight for height <-2 Z score or presence of oedema in the pastoral livelihood. Similarly 18% boys and 15% girls; 20% boys and 15% girls were acutely malnourished in agropastoral and riverine livelihoods respectively (Table 4.11). The results show that higher proportions of boys were malnourished than girls in all the three livelihoods. However, statistically both sexes were equally likely to be malnourished ($p > 0.05$).

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	9 (5.3%)	39 (21.8%)	15 (7.2%)	42 (27.1%)	10 (5.6%)	35 (21.7%)
18-29	4 (1.9%)	46 (25.7%)	5 (2.5%)	31 (20.0%)	6 (2.9%)	38 (23.6%)
30-41	4 (1.9%)	33 (18.4%)	3 (1.5%)	27 (17.4%)	6 (2.9%)	31 (19.3%)
42-53	3 (1.6%)	28 (15.6%)	3 (1.5%)	35 (22.6%)	6 (3.2%)	34 (21.1%)
54-59	3 (2.6%)	33 (18.4%)	3 (2.6%)	20 (12.9%)	4 (3.1%)	23 (14.3%)
Total	23 (2.6%)	179 (19.9%)	29 (3.1%)	155 (16.7%)	32 (3.5%)	161 (17.7%)

The proportion of malnourished children was highest among either the 18-29 months age category (25.7% in pastoral and 23.6% in riverine livelihoods) or among the younger 6-17 months age bracket (followed by 18-29 age bracket (15.8%) and was lowest (10.9%). However, analysis of distribution of malnutrition between the breastfeeding age group 6-24 months and the 25-59 months category showed no statistical difference among them ($p > 0.05$) except among the agropastoral population where children in the breastfeeding age were 1.3 times more likely to be malnourished ($1.01 < RR = 1.34 < 1.83$; $p = 0.0499$) than their older counterparts. Equally there was no statistical difference ($p > 0.05$) in malnutrition levels among the 6-29 months and 30-59 months age bands.

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=880		N=825		N=819	
GAM (MUAC< 12.5 cm or oedema)	86	9.8 (7.2-12.4)	71	8.6 (5.7 – 11.5)	54	6.6 (4.4 – 8.8)
SAM (MUAC< 11.0 cm or oedema)	14	1.6 (0.5 - 2.7)	7	0.8 (0.2 - 1.5)	2	0.2 (0.0 - 0.6)
Pregnant Women MUAC	N=124		N=81		N=108	
Total malnourished (MUAC< 23.0 cm)	18	14.5 (4.9 – 24.1)	26	32.1 (19.0 -45.2)	9	8.3 (3.5 - 13.2)
Severely malnourished (MUAC≤ 20.7 cm)	3	2.4 (0.0 – 5.8)	9	11.1 (3.1 – 19.1)	7	6.5 (1.9 – 11.1)
Non pregnant women MUAC	N=283		N=402		N=335	
Total malnourished (MUAC≤ 18.5 cm)	0	0.0	2	0.5 (0.0 – 1.2)	1	0.3 (0.0 – 0.9)
Severely malnourished (MUAC< 16.0 cm)	0	0.0	0	0.0	1	0.3 (0.0 – 0.9)

Based on MUAC measurements, acute malnutrition rates (MUAC< 12.5 cm or oedema) of 9.8% (CI: 7.2 – 12.4); 8.6% (CI: 5.7 – 11.5) and 6.6% (CI: 4.4 – 8.8) in Pastoral; Agropastoral and Riverine livelihoods respectively indicating serious malnutrition situation (Table 4.13).

Among the assessed women; high malnutrition rates were recorded among the pregnant women (MUAC< 23.0 cm) ranging from 8.3% (CI: 3.5 – 13.2) in Riverine to 32.1% (19.0 – 45.2) in the agropastoral livelihood system. A high proportion of pregnant women were also severely (MUAC<20.7 cm) at risk of malnutrition as indicated in Table 4.13. Pregnancy raises physiological and nutritional demands of women making them vulnerable to malnutrition.

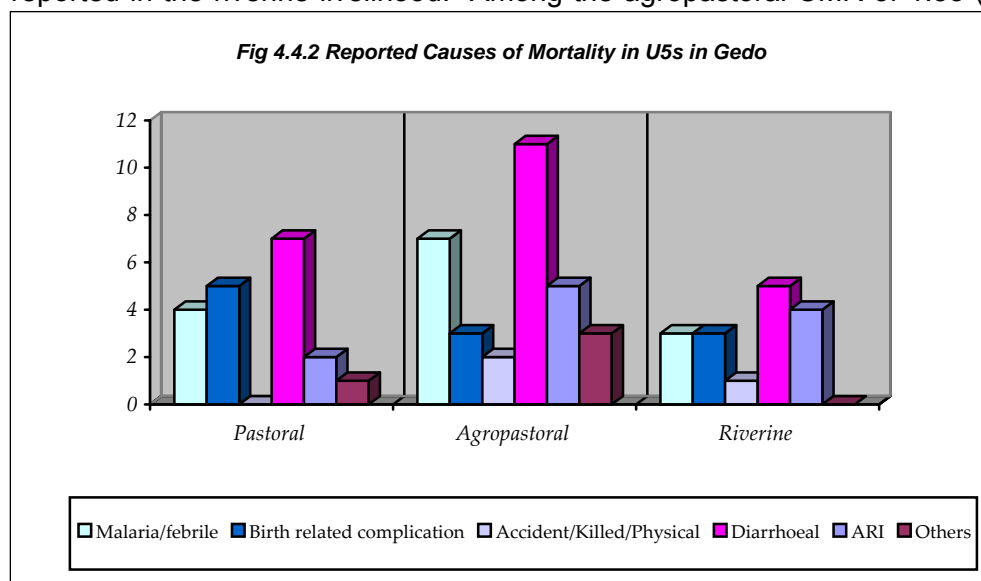
4.5 Mortality

A total of 13, 656 persons, 3, 867 of them under fives from 2706 households were assessed for mortality in the three livelihood-based assessments. Out of these, 155 deaths were reported, 66 of them children under five years of age.

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

	Pastoral		Agropastoral		Riverine	
	U5	Total	U5	Total	U5	Total
Total HHs surveyed		904		902		900
Total Population assessed in HHs	1444	4483	1318	4699	1105	4474
Number who joined the HHs	0	15	7	77	1	47
Number who left the HHs	2	50	7	121	2	96
Number of births		63		65		44
Number of deaths	19	46	31	65	16	44
Mortality rate	1.48 (0.22–3.18)	1.05 (0.51 – 1.6)	2.65 (1.11 – 4.18)	1.53 (0.75 – 2.3)	1.63 (0.68 – 2.57)	1.09 (0.5 – 1.67)

The crude and U5 mortality rates were 1.05 (0.51-1.60) and 1.48 (0.22-3.18) respectively among the pastorals. Similar CMR and U5MR rates of 1.09 (0.50 -1.67) and 1.63 (0.68 – 2.57) respectively were reported in the riverine livelihood. Among the agropastoral CMR of 1.53 (0.75 – 2.30) and U5MR of 2.65 (1.11-4.18) were reported (Table 4.14).



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

Respiratory infections; physical injuries (killings/accidents) and

others like cancer and TB were reported as the main causes of death among adults. It should be noted that the mortality recall period covered the months of March and April that experienced AWD outbreak with Case Fatality Rate of 1.55% in Gedo region, explaining the high diarrhoea related deaths.

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 briefer assessment,

and ensured that rural communities and IDPs living outside the main villages were included in the assessment.

Currently there is no water stress in the region, as most of the sources contain water. Most of the areas in Gedo had access to water sources, mainly from open wells and river. The berkads are either full or partially filled. In some cases however, water from the shallow wells become saline making it unfit for human and livestock consumption. Overall, the livestock situation is normal and an increased herd size is expected, as livestock calve and kid. The livestock body condition is improving with the effect of green pasture available at medium recovery. Camel milk production is expected to increase and the price has already dropped in pastoral settlements. 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 increased demand by families hosting IDPs from Mogadishu. In addition many households had sorghum purchased from the market, produced or distributed by CARE and WFP as food aid. CARE distributed food (sorghum; oil and lentils) in the northern districts of Gedo while WFP distributed food in Southern Gedo in March and April.

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 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 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

Results indicate continuing **critical** nutrition levels (GAM of 15-19.9) in all the three assessments with the highest point prevalence reported in the Pastoral livelihood with **GAM of 19.9%** (CI 17.4 – 22.7) followed by the Riverine livelihood with a GAM of **17.7%** (CI: 14.1-21.3). Agropastoral livelihood recorded the lowest malnutrition rate with a **GAM of 16.7%** (CI: 13.1 -20.3). However, as the confidence interval ranges overlap between all three studies there is no statistically significant difference between the three livelihood zones. Even though the results are not statistically different, integrated analysis shows some improvement from the previous assessment¹² when GAM of 23.8% (CI: 21.1-26.7%) was reported. The latest nutrition situation estimates (January 2007 map) indicated a critical nutrition situation in Gedo (Appendix 6) with worrying trends in the riverine populations, having lost most of their crops to flooding.

Possible explanation for the noted improvement could be the improved dietary diversity which was reportedly high with between 72 and 92% of the households consuming four or more food groups in the previous 24 hours. In addition improved milk consumption (84-92%) and recent supplies of cereals, pulses and oil in addition to own sorghum production could have contributed to improved dietary diversity and by extension to improved nutrition status. Even though the majority of the assessed households reportedly sourced their food through purchasing (>64%), a significant proportion obtained their staple cereals through food aid (29-35%) and own production (17-57%). Increased sourcing of staple food through own production especially of milk by pastoralists and cereals by agropastoral or riverine populations is an indicator of improving food security. For instance, 40-57% of the milk consumed was produced by the households and 58% of the consumed cereals in the agropastoral population were produced by the households.

Food security situation among the pastoral and agropastoral areas has been improving following good deyr 06/07 season 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. However, the situation in the riverine areas deteriorated due to severe flooding and three consecutive seasons of low crop production. There could be further deterioration given that the *Gu* '07 rains are likely to be below normal in terms of intensity, distribution and coverage.

The crude mortality rates for the three assessments were above the ¹³alert threshold (*1/10,000/day*) indicating a concerning situation again similar to the mortality situation from the previous assessment in March 2006. For the under five year mortality rate only the results for the Agropastoral population (U5MR = 2.65; CI: 1.11-4.18) indicated alert levels with the other two at acceptable levels. The consistently high morbidity rates, especially diarrhoea (>16%) are possible aggravating factors to the nutrition situation. High diarrhoea related mortality could be linked to an outbreak of acute watery diarrhoea reported during the assessment period with a total of 1793 AWD cases and 45 related deaths. Overall, the assessment revealed high level of morbidity in Gedo region where over 30% of the assessed children had some form of illness in the two weeks prior to the assessment. 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. A rapid diagnostic test for malaria conducted concurrently in the region reported a prevalence of **19.7%** confirmed among the Gedo population. Analysis continues to show strong significant association between malnutrition and morbidity rates. Children who had been ill within two weeks prior to the assessment were more likely to be malnourished ($p < 0.05$).

¹² FSAU Nutrition Update March 2006

¹³ WHO References

Health programme campaign for measles (>71% except in agropastoral – 30%), polio immunization (>80%) and Vitamin A supplementation (>70% except in agropastoral – 32%) may have mitigated the adverse effects of morbidity on nutrition situation in the region. The coverage is attributed to the ongoing health interventions and the regular UNICEF/WHO anti-polio campaigns.

Insecurity, unemployment, stressed livelihoods, poor child feeding and poor access to health services remain the main underlying causes of malnutrition in Gedo region. Gedo has experienced sporadic armed conflict for over 15 years with devastating effects of 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.

6.0 Recommendations

It should be emphasised that, in spite of this evidence of a slight recovery, the results continue to highlight that **the rates of acute malnutrition in Gedo have been and still remain at unacceptable levels for over 12 years**. 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 household food security to prevent further deterioration of the nutrition situation. This may be achieved by intensifying provision of food (especially non cereals like pulses and oils since cereals/sorghum is available in the market) and non-food items in short term and support to the recovery of livelihoods.
- 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 means need to be considered. Capacity building of the existing MCH and the community to manage malnourished children could be explored.
- There is need to focus on programmes that improve diet diversity and consumption of micronutrient rich foods.
- There is need to have intervention to cater for livestock given that food aid meant for human consumption is shared with livestock.
- Intervention programmes on water, sanitation and hygiene practices including health education.

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 of in Gedo region. Introduction of small-scale credit system for small business.
- 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 Gedo region.
- Establish mobile veterinary team to cater for livestock health especially in the pastoral livelihood group.

Appendix 1. Gedo Nutrition Assessment Household Questionnaire, April 2007

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

Q1-8 Characteristics of Household

Q1a. Household size¹⁴ ? _____ **Q1b.** Number of children < 5 years)? _____ **Q1c.** No. of Children aged 24-71 months (2 - <6 years)? _____

Q2a. Does household have mosquito net? _____ 1= Yes 0= No **Q2b.** If yes, ask to see the net : _____ 1= GFSOM label 2=Other type 3= Not seen

Q3 What is your present household residence status? 1= Resident¹⁵ 2=internally displaced person (IDP)¹⁶ 3=Returnees¹⁷4=Internal immigrant¹⁸ 5=Refugees _____
If answer to the above is 1, then move to Question 7.

Q4 Place of origin 1= within the same district 2= within the same region 3= other parts of Somalia 4= Ethiopia 5=other areas, specify _____

Q5 Duration of stay (in months) _____

Q6 Reason for movement: 1= Civil insecurity/ fighting 2=Seeking jobs 3= Food shortage 4= Food/pasture/water shortage 5= Seasonal/climatic

Q7 What is the main livelihood systems used by this household? 1= Pastoral 2=Agro-pastoral 3=Urban 4= Riverine (irrigated agriculture; fishing) 5= Destitute

Q8. 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/none 7= Others, specify _____

Q9-16 Feeding and immunization status of children aged 6 – 59 months (or 65 – 109.9 cm) in the household.

First Name	Q9 Age (months) <i>(if child is more than 24 months old, skip to Q15)</i>	Q10 (If 6-24 months) Are breastfeeding ¹⁹ you the child? <i>(if no, skip to Q12)</i> 1=Yes 0= No	Q11 (If 6-24 months) If breast feeding, how many times/day? 1=2 times or less 2=3-6 3=On demand	Q12 (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	Q13 (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.	Q14 (If 6-24 months) How many times do you feed the child in a day <i>(besides breast milk)</i> ? 1= Once 2= Twice 3= 3-4 times 4= 5 or more times	Q 15 Has child been provided with Vitamin A in the last 6 months? <i>(show sample)</i> 1=Yes 0= No	Q16 (If ≥9 months old) Has child been Vaccinated against measles in the last 6 months? 1=Yes 0= No	Q17 Has the child ever been given polio vaccine orally? 1=Yes 0= No
1									
2									
3									
4									

¹⁴ Number of persons who live together and eat from the same pot at the time of assessment

¹⁵ A person who dwells in a particular place permanently or for an extended period

¹⁶ A person or groups of persons who have been forced or obliged to flee o to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights, or natural or human-made disasters, and who have not crossed an internationally recognized State Border" source, guiding principles on internal displacement

¹⁷ Refugees who have returned to their country (Somalia) or community of origin, Somalia, either spontaneously or through organized repatriation [UNHCR definition]

¹⁸ A person who moves (more or less permanently) to a different administrative territory due to a wide range of reasons (e.g. job related, security)

¹⁹ Child having received breast milk either directly from the mothers or wet nurse breast within the last 12 hours

Q17-28 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>	Q18 Child Sex 1=Male 2=Female	Q19 Oedema 1=yes 0= No	Q20 Height (cm)	Q21 Weight (kg)	Q22 MUAC (cm)	Q23 Diarrhoea ²⁰ in last two weeks 1= Yes 0= No	Q24 Serious ARI ²¹ in the last two weeks 1=Yes 0= No	Q25 Febrile illness/ suspected Malaria ²² in the last two weeks 1=Yes 0= No	Q26 (If ≥9 month) Suspected Measles ²³ in last one month 1=Yes 0= No	Q27 Did child sleep under a mosquito net last night? 1=Yes 0= No	Q28 Where did you seek healthcare assistance when child was sick? (If yes in Q23 – 26) 1=No assistance sought 2=Own medication 3=Traditional healer 4=Private clinic/ Pharmacy 5= Public health facility
1											
2											
3											
4											

29: 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

Q30 Does any member of the household have difficulty seeing at night or in the evening when other people do not? 1= 24- 71 months 2= ≥ 6 years 3= None

Q31-34 Access to water (quality and quantity)

Q31 Main source of drinking water 1 = Tap/ piped water 2= Protected wells, boreholes 3 = Unprotected open /shallow wells, river or berkads 4=Others, specify _____

Q32 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

Q33 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

Q34 What is the method of water storage in the household? 1=Covered containers 2=Open containers 3=Constricted neck/end (Ashuun)

²⁰ Diarrhoea is defined for a child having three or more loose or watery stools per day

²¹ ARI asked as ooof wareen or wareento. The three signs asked for are cough, rapid breathing and fever

²² Suspected malaria/acute febrile illness: - the three signs to be looked for are periodic chills/shivering, fever, sweating and sometimes a coma

²³ 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

Q35-38 Sanitation and Hygiene (access and quality)

Q35 Type of toilet used by members of the household: 1=Flush toilets 2=Improved pit latrine (VIP) 3=Traditional pit latrine/ Open pit 4=Bush/open ground (*If Bush skip to Q37*)

Q36 Distance between toilet and water source 1=1- 30 metres 2=30 metres or more

Q37 What washing agents do you use in your household? 1=Soap 2=Shampoo 3=Ash 4=Plant extracts 5=None

Q38 How do you store prepared food? 1= Suspend in ropes/hooks 2=Put in pots beside the fire 3= Put in covered containers 4= Don't store 5= Other, specify _

Q 39 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/families 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. Meat, poultry, offal (e.g. goat/camel meat, beef; chicken or their products)?		
3. Eggs?		
4. Roots and tubers (e.g. potatoes, arrowroot)?		
5. Vegetables (e.g. green or leafy vegetables, tomatoes, carrots, onions)?		
6. Fruits (e.g. water melons, mangoes, grapes, bananas, lemon)?		
7. Pulses/legumes, nuts (e.g. beans, lentils, green grams, cowpeas)?		
8. Milk and milk products (e.g. goat/camel/ fermented milk, milk powder)?		
9. Oils/fats (e.g. cooking fat or oil, butter, ghee, margarine)?		
10. Sugar and honey?		
11. Fish and sea foods (e.g. fired/boiled/roasted fish, lobsters)?		
12. Miscellaneous (e.g. spices, chocolates, sweets, beverages, etc)?		
Q40 In general what is the <u>main</u> source of food in household? (*Use codes above) _____		
Q41 Total number of food groups consumed (filled by enumerator): _____		

Q42 - 43 Informal and formal Support or Assistance in last three months (circle all options that apply)

Q42 Which of these informal supports did you receive within the last three months if any?
 1=Zakat from better-off households 2=Remittances from Abroad 3=Remittances from within Somalia
 4=Gifts 5=Loans 6=None 7= Other (specify) _____

Q43 Which of this formal international or national aid support did you receive within the last three months if any?
 1= Free cash 2=Free food 3=Cash for work 4=Food for work 5=Supplementary food
 6=Water subsidy 7 Transportation of animals subsidy 8=Veterinary care 9=None 10= Other (specify) _____

Checked by supervisor (signed): _____

APPENDIX 3: TRADITIONAL CALENDAR

Month	Events	2002	2003	2004	2005	2006	2007
Jan.	Beginning of Jiilal		51 Siditaal	39 Siditaal	27 Siditaal Safari park retreat	15 Siditaal	3 Carafu
Feb.	Mid of Jiilaal		50 Arafo/Dul-Xaj	38 Arafo/Dul-Xaj	26 Arafo/Dulxaj	14 Arafo/Dulxaj Sheikh Indhocaadde-Baidoa attack	2 Seko
Mar.	End of Jiilaal		49 Sako	37 Sako	25 Sako	13 Sako/Safar Sheikh Ibrahim Bardera ceremony	1 Safar
Apr.	Beginning of Gu'		48 Safar	36 Safar	24 Safar	12 Safar/Mawliid	Safar/ Mawliid
May	Mid of Gu'	59 Mawlid	47 Mawlid	35 Mawlid	23 Mawlid	11 Mawlid/Jamadul-awal.	
Jun.	End of Gu'	58 Malmadoone/ Milihore	46 Malmadoone/ Milihore	34 Malmadoone/ Milihore	22 Malmadoone/ Milihore	10 Malmadoone/ Milihore/Jamadul-awal	
July	Beginning of Xagaa	57 Jamadul-Awal/	45 Jamadul-Awal/	33 Jamadul-Awal/	21 Jamadul-Awal/	9 Jamadul-Awal/	
Aug.	Mid of Xagaa	56 Jamadul-Akhir/	44 Jamadul-Akhir/	32 Jamadul-Akhir/	20 Jamadul-Akhir/	8 Jamadul-Akhir/	
Sep.	End of Xagaa	55 Rajab/Shacbaan	43 Rajab/Shacbaan	31 Rajab/Shacbaan	19 Rajab/Shacbaan	7 Rajab/Shacbaan	
Oct.	Beginning of Deyr	54 Shacbaan	42 Shacbaan	30 Shacbaan/ Ramadan	18 Shacbaan/ Ramadan Election of president Abdulahi Yusuf in Kenya.	6 Ramadan	
Nov.	Mid of Deyr	53 Soon (Ramadhan)	41 Soon (Ramadhan)	29 Soon (Ramadhan)	17 Soon (Ramadhan)	5 Soonfur	
Dec.	End of Deyr	52 Soon fur	40 Soonfur	28 Soonfur	16 Soonfur	4 Sidatal	

Appendix 4: Clusters Sampling for Gedo 2007 assessment

Pastoral Livelihood

District	Village	Population	Cum Pop	Cluster No.		
Luuq	Dogob	430	430			
	Mundolow	400	830	1		
	Bohol Garas	700	1530			
	Qooney	700	2230	2		
	Shaatilow	350	2580			
	Yurkud	2000	4580	3	675	1
Elwak	Town - Hawlwadaag	3040	7620	4; 5	2191	2
	Town - October	1560	9180	6	3707	3
	Shamarole	900	10080	7	5223	4
	Dhamasa	1000	11080		6739	5
	Aws Qurun	1500	12580	8	8255	6
	Busar	1000	13580	9	9771	7
	Sheebow	600	14180		11287	8
	Nus Dariq	500	14680	10	12803	9
	Cel Banda	400	15080		14319	10
	Warseesrage	600	15680		15835	11
	Dar- es- salam	300	15980	11	17351	12
	Giriley	500	16480		18867	13
	Dibayu	900	17380	12	20383	14
	Boru Bardeso	400	17780		21899	15
	Chan bile	500	18280		23415	16
	Buryalaan	300	18580		24931	17
	Likooley	400	18980	13	26447	18
	Dasso	300	19280		27963	19
	Indhoel	900	20180		29479	20
	Muudalle	400	20580	14	30995	21
Dolo	Town	2750	23330	15	32511	22
	Gubataa	300	23630	16	34027	23
	Gedweyne	750	24380		35543	24
	Handhar	450	24830		37059	25
Garbahare	Faanweyn	480	25310	17	38575	26
	Dhubbaa	420	25730		40091	27
	Town A	3000	28730	18; 19	41607	28
	Town B	3000	31730	20; 21	43123	29
	Dabley	600	32330		44639	30
	Bura	700	33030	22		
	Ceel Guduud	1500	34530	23		
	Ceel Cadde	2000	36530	24		
Bellet Hawa	Gaawido	1500	38030	25		
	Oda	1400	39430	26		
	Malmalley 1	2250	41680	27; 28		
	Laanabeer	425	42105			
	Jiracle	750	42855			
	Lo' lays	475	43330	29		
	Burijaabo	500	43830			

	Carra Case	200	44030	
	Khadija Xaaji	250	44280	
	Gaddoon dhowe	200	44480	
	Baqtile	150	44630	
Bardera	Faafaxadhun	840	45470	30
45470				

Random No. = **675**Cluster Interval = **1516***Agropastoral Livelihood*

District	Village	Population	Cum Pop	Cluster No.
Luuq	Garbolow	500	500	31
	Ceel Boon	1000	1500	32
Garbahare	Raysqode	200	1700	
	Maykarebay	380	2080	
	Doofarrey	200	2280	
	Tulo - Barwaqo	1000	3280	33
	Maracade	300	3580	
	Fadhweyn	350	3930	
	Tulo - Gordo	360	4290	34
	Godey	400	4690	
	Libaaxlow	500	5190	
Bardera	Sharaawe	180	5370	35
	Tubaako	460	5830	
	Kuduk	360	6190	
	Bulosowjo	460	6650	36
	Korey A	180	6830	
	Garun	200	7030	
	Muddul Jaalle	376	7406	
	Korubood	120	7526	
	Guuray	140	7666	
	Uusley	150	7816	
	Malmalka	200	8016	37
	Tooray	280	8296	
	Qasaaleey	200	8496	
	Qotiileey	300	8796	
	Mataano	800	9596	38
	Wehelow	340	9936	
	Bullagaduud	438	10374	
	Malmalkuus	200	10574	39
	Bulogudud	200	10774	
	Bakal	450	11224	
	Buulodhucuq	546	11770	40
	Bulo borrey	260	12030	
	Burguduud	300	12330	
	Warhareri	120	12450	
	Kotey	320	12770	
	Laamalooshe	432	13202	41

153 31
1440 32
2727 33
4014 34
5301 35
6588 36
7875 37
9162 38

	Bullocaddey	500	13702		10449	39
	Barsare	180	13882		11736	40
	Burcambaar	260	14142		13023	41
	Buulagaduud 3	321	14463	42	14310	42
	Warguduud	300	14763		15597	43
	Baargarab	345	15108		16884	44
	Takat	240	15348		18171	45
	Buulobaar	321	15669	43	19458	46
	Baradhufle	231	15900		20745	47
	Buulohareeri	329	16229		22032	48
	Reydab	432	16661		23319	49
	Bulo-abaq	456	17117	44	24606	50
	Biilalle	200	17317		25893	51
	Dhuyaal	150	17467		27180	52
	Shabbadda	760	18227	45	28467	53
	Galooley	150	18377		29754	54
	Buulofuur	60	18437		31041	55
	Ceelgaras	260	18697		32328	56
	Miidhi	240	18937		33615	57
	Baliqansax	432	19369		34902	58
	Sabeyseyle	200	19569	46	36189	59
	Oofkacaan	160	19729		37476	60
	Bulomareer	190	19919			
	Wargaras	140	20059			
	Lebibuul	398	20457			
	Qarsaaley	360	20817	47		
	Jiidow	160	20977			
	Hareeri	400	21377			
	Buulojadid	240	21617			
	Buuloguduud	220	21837			
	Humbaawe	206	22043	48		
	Shongoloow	2520	24563	49		
	Laheley	346	24909	50		
	Bibeellow	240	25149			
	libato	1600	26749	51		
	Degtuweer	198	26947			
	Aqabta	329	27276	52		
	Koromey	560	27836			
	Macallin dheere	650	28486	53		
	Gargalis	250	28736			
	Warsamaale	100	28836			
	Kamarray	80	28916			
	Bakal Wabeeri	250	29166			
	Bakal Busley	160	29326			
	Buula Qansax	320	29646			
	Buulo oodan	231	29877	54		
	Buuloshiid	432	30309			
	Daleeldheerey	387	30696			
	Ceel Cillaan	500	31196	55		

	Xagar Gandoob	450	31646	
	Waraabaale	250	31896	
	Bilis Yare	650	32546	56
	Buulogawaan	321	32867	
	Hilo Shiid	670	33537	
	Kormaraay	480	34017	57
	Biciibley	800	34817	
	Ballidoogle	231	35048	58
	Xanyaaleey	300	35348	
	Damballey	200	35548	
	Dhaydheere	200	35748	
	Abaayle	120	35868	
	Labiileey	150	36018	
	Taagaabo	400	36418	59
	Bagdhad	200	36618	
	Afgooye	550	37168	
	Hilo Ari	120	37288	
	Hagar Bula	200	37488	60
	Bulo Damo	80	37568	
	Bulo goof	60	37628	
	Bulo Leisan	80	37708	
	Bulagaras 2	300	38008	
	Muri	40	38048	
	Dooni	150	38198	
	Buulo Asharaf	200	38398	
	Buulo Addey 1	200	38598	
38598				

Random No. = **153**
Cluster Interval = **1287**

Riverine Livelihood

District	Village	Population	Cum Pop	Cluster No.
Luuq	Town - Hillac	2000	2000	61
	Town - Waaberi	1500	3500	62; 63
	Town - Sheikh Maxad	2000	5500	64
	Town - Buula Musley	1500	7000	65
	Town - Garoonka	500	7500	66
	Town - Jasiira	300	7800	
	Town - Bulla Qodaxley	1500	9300	67
	Town - Cakararo	1600	10900	68
	Town - Aqabuul	1500	12400	69
	Boyla	400	12800	70
	Taagane	400	13200	
	Luuqgodey	800	14000	71
	Horseed	350	14350	
	Haanoy	650	15000	72

	Dhay dhere	200	15200			
	Maganey	500	15700			
	Ban Mudule	1000	16700	73		
	Caracase	400	17100			
	Mareyle	700	17800	74		
	Balawasiley	400	18200			
	Abow	700	18900	75		
	Halbow	678	19578			
	Madaway	550	20128			
	Shiidley	500	20628	76	860	61
	Abdikheyr	570	21198		2145	62
	Wariiryalle	1000	22198	77	3430	63
	Hawdey	500	22698		4715	64
	Burjo	500	23198	78	6000	65
Dolo	Surguduud	500	23698		7285	66
	Unsi	500	24198	79	8570	67
	Unsi diqa	150	24348		9855	68
	Kurtun	300	24648		11140	69
	Bantaal	500	25148		12425	70
	Dhuusay	600	25748	80	13710	71
	Xamare	500	26248		14995	72
	Deegreebe	600	26848	81	16280	73
	Wagadeey 1	300	27148		17565	74
	Wagadeey 2	400	27548		18850	75
	Koorey	500	28048	82	20135	76
Garbahare	Hilo Mareer	300	28348		21420	77
	Surriyo	1000	29348	83	22705	78
	Huufay	380	29728		23990	79
	Malkaa hidda	420	30148		25275	80
	Golweyn	200	30348		26560	81
Bardera	Hilfato	120	30468	84	27845	82
	Barta Fanyo	300	30768		29130	83
	Kukuto	160	30928		30415	84
	Gaaguure	900	31828	85	31700	85
	Barow Diinle	580	32408		32985	86
	Caanoole	500	32908		34270	87
	Hilo Ari	160	33068	86	35555	88
	Bulo Alow	140	33208		36840	89
	Bulo Godut	260	33468		38125	90
	Dhoobley	580	34048			
	Carmo	600	34648	87		
	Bakal Washaq	400	35048			
	Buuloweyne	1200	36248	88		
	Hilo Carmo	190	36438			
	Af Yar	100	36538			
	Mugdile	100	36638			
	Marda	510	37148	89		
	Sarinleey	1000	38148	90		
	Shimbiroole	400	38548			

38548

Random No. = 860
Cluster Interval = 1285

Gedo Overall

District	Cluster No.	Village	Population	Livelihood Group
Dolow	1	Mundolow /Gedweyne (T4)	400	Pastoral
9	2	Qooney/ Surgaduud (T4)	700	Pastoral
	3	Yurkud / Hamare (T4)	2000	Pastoral
	15	Town (T4)	2750	Pastoral
	16	Gubataa (T4)	300	Pastoral
	79	Unsi (T4)	500	Riverine
	80	Dhuusay (T4)	600	Riverine
	81	Deegreebe (T4)	600	Riverine
	82	Koorey (T4)	500	Riverine
Elwak	4; 5	Town - Hawlwadaag (T3)	3040	Pastoral
11	6	Town - October (T3)	1560	Pastoral
	7	Shamarole (T3)	900	Pastoral
	8	Aws Qurun (T3)	1500	Pastoral
	9	Busar (T3)	1000	Pastoral
	10	Nus Dariq (T5)	500	Pastoral
	11	Dar- es- salam (T3)	300	Pastoral
	12	Dibayu (T3)	900	Pastoral
	13	Likooley (T5)	400	Pastoral
	14	Muudalle (T3)	400	Pastoral
	Garbahare	17	Faanweyn (T6)	480
11	18; 19	Town A (T6)	3000	Pastoral
	20; 21	Town B (T6)	3000	Pastoral
	22	Bura (T6)	700	Pastoral
	23	Ceel Guduud (T6)	1500	Pastoral
	24	Ceel Cadde (T6)	2000	Pastoral
	33	Tulo - Barwaqo (T5)	1000	Agropastoral
	34	Tulo - Gordo (T5)	360	Agropastoral
	83	Surriyo (T6)	1000	Riverine
Bellet Hawa	25	Gaawido (T5)	1500	Pastoral
5	26	Oda (T5)	1400	Pastoral
	27; 28	Malmalley 1 (T5)	2250	Pastoral
	29	Lo' lays (T5)	475	Pastoral
Luuq	31	Garbolow (T2)	500	Agropastoral
20	32	Ceel Boon (T2)	1000	Agropastoral
	61	Town - Hillac (T1)	2000	Riverine
	62; 63	Town - Waaberi (T10)	1500	Riverine
	64	Town - Sheikh Maxad (T1)	2000	Riverine
	65	Town - Buula Musley (T1)	1500	Riverine
	66	Town - Garoonka (T1)	500	Riverine
	67	Town - Bulla Qodaxley (T1)	1500	Riverine
	68	Town - Cakararo (T1)	1600	Riverine
	69	Town - Aqabuul (T1)	1500	Riverine

	70	Boyla (T1)	400	Riverine
	71	Luuqgodey (T1)	800	Riverine
	72	Haanoy (T2)	650	Riverine
	73	Ban Mudule (T2)	1000	Riverine
	74	Mareyle (T2)	700	Riverine
	75	Abow (T2)	700	Riverine
	76	Shiidley (T2)	500	Riverine
	77	Wariiryalle (T2)	1000	Riverine
	78	Burjo (T2)	500	Riverine
Bardera	30	Faafaxadhun (T10)	840	Pastoral
34	35	Sharaawe (T8)	180	Agropastoral
	36	Bulosowjo (T9)	460	Agropastoral
	37	Malmalka (T10)	200	Agropastoral
	38	Mataano (T7)	800	Agropastoral
	39	Malmalkuus (T8)	200	Agropastoral
	40	Buulodhucuq (T7)	546	Agropastoral
	41	Laamalooshe (T7)	432	Agropastoral
	42	Buulagaduud 3 (T10)	321	Agropastoral
	43	Buulobaar (T7)	321	Agropastoral
	44	Bulo-abaq (T7)	456	Agropastoral
	45	Shabbadda (T9)	760	Agropastoral
	46	Sabeyseyle (T9)	200	Agropastoral
	47	Qarsaaley (T9)	360	Agropastoral
	48	Humbaawe (T9)	206	Agropastoral
	49	Shongolooow (T9)	2520	Agropastoral
	50	Laheley (T10)	346	Agropastoral
	51	libato (T9)	1600	Agropastoral
	52	Aqabta (T10)	329	Agropastoral
	53	Macallin dheere (T9)	650	Agropastoral
	54	Buulo oodan (T8)	231	Agropastoral
	55	Ceel Cillaan (T9)	500	Agropastoral
	56	Bilis Yare (T8)	650	Agropastoral
	57	Kormaraay (T8)	480	Agropastoral
	58	Ballidoogle (T8)	231	Agropastoral
	59	Taagaabo (T7)	400	Agropastoral
	60	Hagar Bula (T7)	200	Agropastoral
	84	Hilfato (T7)	120	Riverine
	85	Gaaguure (T7)	900	Riverine
	86	Hilo Ari (T8)	160	Riverine
	87	Carmo (T8)	600	Riverine
	88	Buuloweyne (T8)	1200	Riverine
	89	Marda (T10)	510	Riverine
	90	Sarinleey (T10)	1000	Riverine

Appendix 4b. Gedo 2007 Assessment Team

Team No.	Team members	Cluster No.	Village	Livelihood Group
	Luuq			
1	1. Abdullahi Warsame (S)	61	Town - Hillac	Riverine
		64	Town - Sheikh Maxad	Riverine
	2. Sahra Mohamed Kassim	65	Town - Buula Musley	Riverine
		66	Town - Garoonka	Riverine
	3. Sahra Abdullahi Hashe	67	Town – Bulla Qodaxley	Riverine
		68	Town - Cakararo	Riverine
	4. Ibrahim Samaan (N)	69	Town - Aqabuul	Riverine
		70	Boyla	Riverine
		71	Luuqgodey	Riverine
	Luuq			
2	1. Mohamed Abdillahi (S)	31	Garbolow	Agropastoral
		32	Ceel Boon	Agropastoral
	2. Hodan Hussein Adan	72	Haanoy	Riverine
		73	Ban Mudule	Riverine
	3. Sahra Ali Ahmed	74	Mareyle	Riverine
		75	Abow	Riverine
	4. Mustafa Aden Yarow (N)	76	Shiidley	Riverine
		77	Wariiryalle	Riverine
		78	Burjo	Riverine
	Elwak			
3	1. Abdinasir Mohamed (S)	4; 5	Town - Hawlwadaag (T3)	Pastoral
		6	Town - October (T3)	Pastoral
	2. Bishar Ibrahim Ali	7	Shamarole (T3)	Pastoral
		8	Aws Qurun (T3)	Pastoral
	3. Bashir Sheikh	9	Busar (T3)	Pastoral
		11	Dar- es- salam (T3)	Pastoral
	4. Maxamed Omar Arab (N)	12	Dibayu (T3)	Pastoral
14		Muudalle (T3)	Pastoral	
	Dolow			
4	1. Mohamed Dagani Arab (S)	1	Mundolow /Gedweyne (T4)	Pastoral
		2	Qooney/ Surgaduud (T4)	Pastoral
		3	Yurkud / Hamare (T4)	Pastoral
	2. Abdulkadir Abdullahi Abdi	15	Town (T4)	Pastoral
		16	Gubataa (T4)	Pastoral
	3. Nuur Hassan Aden	79	Unsi (T4)	Riverine
		80	Dhuusay (T4)	Riverine
	4. Khadijah Sheikh (N)	81	Deegreebe (T4)	Riverine
82		Koorey (T4)	Riverine	
	Bellet Hawa			
5	1. Issack Aden Hassan (S)	25	Gaawido (T5)	Pastoral
		26	Oda (T5)	Pastoral
	2. Ahmed Abdi Areys	27; 28	Malmalley 1 (T5)	Pastoral
		29	Lo' lays (T5)	Pastoral
		10	Nus Dariq (Elwak)	Pastoral

	3. Omar Sheikh Hussein	13	Likooley (Elwak)	Pastoral
		33	Tulo - Barwaqo (G/hare)	Agropastoral
	4. Marian Ahmed Ibrahim (N)	34	Tulo - Gordo (G/hare)	Agropastoral
Coordinators:	1. Tom J. Oguta 2. Peter King'ori 3. Mohamed Borle	All		

APPENDIX 5: REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date: _____

Name of the child: _____ Sex of child: _____

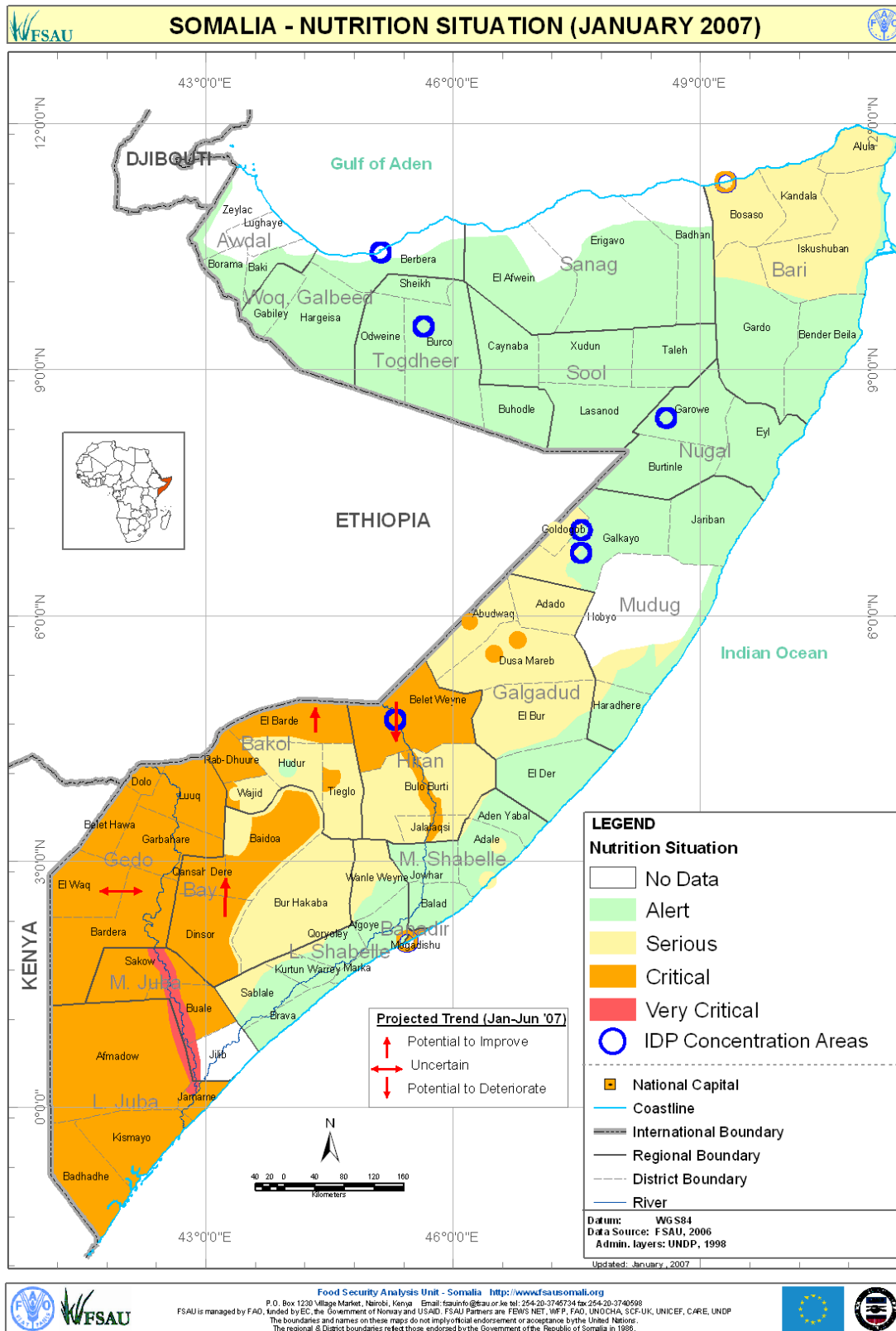
Age of child: _____ Name of caretaker: _____

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

Child referred to: _____

Child referred by: _____

Appendix 6.



Food Security Analysis Unit - Somalia <http://www.fsau-somali.org>
 P.O. Box 1230 Village Market, Nairobi, Kenya Email: fsauinfo@fsau.or.ke tel: 254-20-3746734 fax: 254-20-3746598
 FSAU is managed by FAO, the Government of Norway and USAID. FSAU Partners are FEWS NET, WFP, FAO, UNOCHA, SCF-UK, UNICEF, CARE, UNDP
 The boundaries and names on these maps do not imply official endorsement or acceptance by the United Nations.
 The regional & District boundaries reflect those endorsed by the Government of the Republic of Somalia in 1998.



Appendix 7. Assessments Quality checks

		Pastoral	Agropastoral	Riverine	Reference
Digit preference	Weight	No	No	No	No
	Height	No	0 and 5	0 and 5	No
SD of WHZ		1.1	1.1	1.1	-0.85 to 1.1
Skewness of WHZ		0.68	0.69	0.90	-1 to 1
Kutosis of WHZ		1.13	1.56	3.76 problem	-1 to 1
No of WHZ flags (%)		0.2	0.0	0.1	-
Representativeness of sample	Age group	No bias	No bias	No bias	No bias
	Sex ratio	1.1	1.1	1.0	0.8 to 1.2

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