

# **BELET HAWA DISTRICT GEDO REGION, SOMALIA**

**NUTRITION SURVEY  
October 2002**

**FSAU/GHC/CARE**



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## Abbreviations and acronyms

ACF	Action Contra la Faim
ARI	Acute Respiratory Infections
CARE	
FAO	Food and Agriculture Organisation
FEG	Food Economy Group
FEWS-NET	Famine Early Warning Systems-Network
FSAU	Food Security Assessment Unit
GAM	Global Acute Malnutrition
GHC	Gedo Health Consortium
Ha	Hectares
H/A	Height for Age
IDP	Internally Displaced People
KM	Kilo Metres
MCH	Maternal and Child Health
MSF	Medicin san Frontiers
MT	Metric Tonnes
NCHS	National Centre for Health Statistics
NGOs	Non-Governmental Organisations
NIDs	National Immunisation Days
OR	Odds Ratio
SACB	Somalia Aid Coordination Body
SFP	Supplementary Feeding Programme
TFC	Therapeutic Feeding Centre
UN	United Nations
UNICEF	United Nations Children's Fund
WFP	World Food Programme
W/H	Weight for Height
WHO	World Health Organisation

### **Definitions**

#### ***Deyr Season:***

Short rains normally expected from October to December in southern Somalia. Deyr rains are less widespread and less reliable than the Gu rains. They are usually patchy and localised. Its harvest is normally expected between December and January and provides key food requirement to take households through the Jilaal season. The harvest is normally not significant when compared to the primary/main harvest of the year.

#### ***Gu Season***

The main rainy season in Somalia normally expected between April and June. About 70% of the annual crop and livestock production depend on the Gu rains. This is the heaviest and most reliable rainfall in Somalia. Its harvest is normally expected between July and August.

#### ***Jilaal Season***

This is the dry season of the year in Somalia normally between January and March. There is normally no crop production during this season and the river levels normally drop. Consequently, most livestock migrate in search of water and pasture during this period.

## **Acknowledgements**

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FSAU also expresses its sincere appreciation to the entire team for the high level of commitment and sincerity demonstrated during all stages of this survey.

## Executive Summary

Gedo is the most chronically food insecure region in Somalia, partially explained by recurrent drought in the past three years which led to widespread livestock deaths and/or out migration of animals in search of pasture and water in Lower Juba Region and other parts of Southern Somalia. Four consecutive crop failures among the agro-pastoral and riverine groups in the region have also occurred. The result was severe depletion of household assets. In addition, recurrent insecurity incidences prevailing in the region have hampered humanitarian interventions leading to further loss of assets. Consequently, the acute food insecurity and human suffering was manifested by the unacceptably high total acute malnutrition rate of 37% (using  $<-2$  Z-score/oedema cut-off) in the December 2001 Belet Hawa nutrition survey.

The preceding food security information and appalling malnutrition rates provoked significant humanitarian responses. Both food aid (general and selective feeding) and basic health care services in the district were supported by CARE and Gedo Health Consortium (GHC) amid serious insecurity. The 2002 GU season also witnessed a return of some livestock to the district. Thus, there was a general feeling that food security and nutritional status might have improved although the effect of recurrent insecurity and the diminished asset levels in households was not clear. Implementing organisations and the Humanitarian Response Group of the Somalia Aid Coordination Body (SACB) therefore, recommended a repeat survey in the district.

FSAU in collaboration with GHC, CARE and local authorities conducted a nutrition survey in Belet Hawa District aimed at determining the level of malnutrition among under five children. The survey further aimed at understanding the likely impact of the emergency food-aid intervention, analysing and interpreting the results using the available contextual information and providing guidance on decision making related to future interventions. Using a two-stage cluster sampling methodology, a total of 907 children aged 6-59 months were examined.

The prevalence of global/total acute malnutrition defined as  $W/H < -2$  z-scores or oedema was 21.5% (95% CI 18.9% - 24.5%) severe acute malnutrition defined as  $W/H < -3$  z-scores or oedema was 2.2% (95% CI 1.4% - 3.4%). The results suggest that malnutrition is more common among agro-pastoral children than those from other food economy zones. The survey results confirm a persistently poor nutritional status in the district though they represent significant improvement since the survey of December 2001.

About 88% of the children had received Vitamin A supplementation in the previous six months and 72% had been immunised against measles. About 11% of the children came from internally displaced households and returnee households with insecurity and food shortage being the main reasons for movement.

Substantial food aid (i.e. both the CARE general distribution and GHC/UNICEF selective feeding programme), relatively good 2002 Gu rains and accompanying in-migration of some livestock, more aggressive/improved health service provision (manifested by improved measles immunisation and vitamin supplementation), and relatively low incidences of common child illnesses played a key role in explaining the significant improvement in nutritional status since the December 2001 nutrition survey. In addition, the use of bush products increasingly providing a significant income source to most households in the district. The survey reveals that with a population of about 65,000 residents (WHO, 2002) in Belet Hawa, the relief food services distributed between December 2001 and October 2002 was capable of providing about 70% of the daily food requirements to all individuals assuming minimal losses and use of all the rations within the district.

Continued limited food availability and the almost constant insecurity; poor childcare/feeding practices and disease incidences, all contribute to the persistent poor nutritional status of the population in Belet Hawa District. The significant statistical association between the observed malnutrition and diseases like diarrhoea and malaria confirms that disease prevalence is still a major problem that calls for continued support to comprehensive health and nutrition intervention programmes.

About 27% of the children fed once or twice a day. The overwhelming majority of the children (99%) included in the survey were not exclusively breastfed in their first six months while nearly 98% received foods other than breast milk in their first three months of life. Mothers reported having to travel increasingly long distances in search of water (especially before the Gu 2002 rains). Some responses to limited food access like collecting bush products leads long separation from their young children further compromised childcare.

Both the survey and other FSAU food security information indicate significant shifts in people's livelihood patterns in recent years with many more households now categorised as 'urban' and fewer categorised as 'pastoralist'. Purchases and food aid were the main food sources while casual work and sale of bush products were the dominant income sources. Borrowing and food aid reliance ranked highly as coping strategies.

Further discussions with organisations in Gedo suggest that the enormous relief food supplies could mainly explain the improved nutritional status reported in the survey, as other food security indicators are still poor. Belet Hawa is one of the districts in northern Gedo that continued to receive relief food supplies amidst insecurity incidences.

The organisations involved in the survey presented a range of recommendations, which emphasised the need to focus on both immediate and longer-term food security interventions. The overriding issue in Belet Hawa remains that of insecurity. The immediate emergency response will continue to essentially involve adequate general ration and selective feeding concurrent with continued support to the health, livestock and water sectors. Income generating activities are also key to revive the Belet Hawa economy. The necessity of enabling a more conducive and secure environment for improved access by humanitarian organisations throughout Gedo Region is emphasised.

## SUMMARY OF FINDINGS

Indicator	Number	Percentage
Children under five years screened during the survey	907	100
Number of boys in the sample	477	52.6
Number of girls in the sample	430	47.4
Global acute malnutrition - Weight for Height <-2 Z-score or presence of oedema	195	21.5
Severe acute malnutrition - Weight For Height <-3 Z-score or presence of oedema	20	2.2
Global acute malnutrition - Weight For Height <80% of median or presence of oedema	136	15.0
Severe acute malnutrition - Weight For Height <70% of median or presence of oedema	8	0.9
Global acute malnutrition according to Weight For Height in Z-Score (<-2 Z-score) or presence of oedema in agro-pastoral villages	71	26.6
Global acute malnutrition according to Weight For Height in Z-Score (<-2 Z-score) or presence of oedema in Belet Hawa town including IDP village	77	21.0
Proportion of children with diarrhoea in two weeks prior to the survey.	234	25.9
Proportion of children with ARI in two weeks prior to the survey.	186	20.6
Proportion of children with malaria in two weeks prior to the survey	212	23.4
Proportion of children supplemented with Vitamin A in six months prior to the survey.	797	88.1
Proportion of children immunised against Measles	621	72.0
Proportion of children from displaced households	95	10.5



# 1 INTRODUCTION

Situated within Northern Gedo Region of Somalia, Belet Hawa District remains one of the most chronically food insecure areas of Somalia with baseline deficits in food availability exacerbated by very frequent crises. The population of Belet Hawa has experienced extreme hardship in recent years as a result of a series of disasters, both natural and manmade. Lack of access for humanitarian organisations has hampered surveillance and assessment activities as well as interventions. The last nutrition survey undertaken in Belet Hawa some ten months ago in December 2001 indicated extremely high levels of malnutrition, which led to increased humanitarian activities in the district. In the meantime, almost constant insecurity in the district has severely hampered the humanitarian interventions; delayed significant livestock return to the area; triggered population displacement and greatly contributed to the high degree of vulnerability of the population. However, significant quantities of food aid have reached the population and a number of other activities have been implemented.

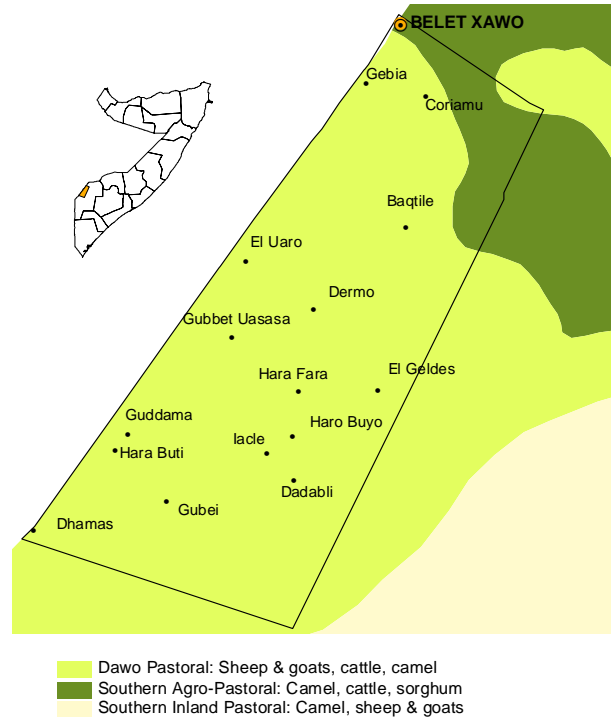
During the Gu 2002 season (April/May), the moderate rainfall improved water availability and rejuvenated pastures. This led to the return of some livestock into some of the accessible areas of the Belet Hawa District. This positive development resulted in an improvement in food security although its effect on the devastated population was small.

Limited access into the district, and north Gedo at large, has contributed to a gap in information flow. The demand for reliable and timely nutrition information on the area increased with the persistence of civil unrest in the district. The urban poor in Belet Hawa have been reported to be heavily depending on food aid (FSAU monthly report, September 2002).

## 1.1 Survey Justification

According to FSAU<sup>1</sup>, Belet Hawa is one of the most food insecure districts in Gedo Region due to its relative inaccessibility to water, recurrent droughts, serious insecurity leading to displacements and massive loss of property, and high disease prevalence due to inadequate care and health services. In December 2001, high malnutrition rates of 37%<sup>2</sup> were recorded. This was followed by significant food aid interventions although the targeted interventions aiming to support those already malnourished were frequently interrupted by insecurity. Displacement of thousands of the district's population during episodes of insecurity and their temporary stay in a controversial refugee camp was again followed by some slightly more optimistic trends with the return of some animals to the area following pasture recovery.

The continued high numbers of malnourished children reported at the Belet Hawa health facility were



1 Food Security Assessment Unit, Somalia

2 Global Acute Malnutrition: W/H<-2 scores plus oedema

difficult to interpret in light of the population movement and the low level of access for senior health and nutrition personnel. As such, the situation presented numerous challenges in maintaining surveillance of the overall welfare of the population. The available nutrition data indicated that in April 2002, 40% of the 650 children screened at Belet Hawa MCH and 43% of 393 children screened in June 2002 were malnourished. Additionally, severely malnourished children in the Belet Hawa Therapeutic Feeding Centre ranged between 35 and 51 in the period May to August 2002.

The demand for a re-evaluation of the status of the population increased in recent months with recommendations for a repeat survey being made by individual humanitarian organisations as well as the Humanitarian Response Group of the Somalia Aid Coordination Body (SACB). In October 2002, a UN security assessment in Gedo reported that an opportunity existed to undertake a survey and FSAU in collaboration with CARE-Somalia, Gedo Health Consortium (GHC) and WHO jointly carried out this nutrition survey.

## 1.2 Survey Objectives

- To determine the levels of malnutrition in Belet Hawa District through anthropometric measurement using the Weight for Height of children between 6-59 months or 65-110 cm.
- To identify populations more vulnerable to food insecurity and malnutrition.
- To determine the coverage of measles vaccination and Vitamin A supplementation in Belet-Hawa District.
- To determine the incidence of diarrhoea, measles and ARI two weeks prior to the survey.
- To describe the possible causes of malnutrition in Belet Hawa District.
- To comment on the likely impact of the emergency food-aid intervention.
- To provide guidance on decision making related to future interventions.

## 2 BACKGROUND INFORMATION

### 2.1 General background

Belet Hawa is one of the most densely populated districts (17 persons/km<sup>2</sup>) in Gedo with an estimated population size of about 66,500 (October 2002 WHO NID figures). (see appendices for population density in other areas). The district is located along the border of Kenya to the West, Ethiopia to the Northwest, Dolow to the North East, Elwak to the South West, Luuq to the East and Garbaharey district to the South East. The population of the district can be broken down in the food economy groups as shown on Table 1.

**Table 1 Food economy groups in Belet Hawa District**

Food economy	Population	%
Pastoral (Dawa)	36,565	55%
Agro-pastoral (Southern)	6,648	10%
Dawa/Juba pump irrigated farmers	1330	2%
Urban	21,938	33%
Total estimated population	66,481	100%

### 2.2 Food security overview

Belet Hawa District and northern Gedo in general has experienced food security challenges that has led to peoples livelihoods greatly compromised. The food security situation has been jeopardized by both man-made and natural factors. In particular, the fluid security situation has hampered delivery of relief food; free movement of trucks carrying imported goods and interrupted peoples livelihoods including farming activities.

Year	Gu season Cereals production (MT)	% of post-war average
1999	370	80%
2000	340	72%
2001	120	25%
2002	30	6%

The total area harvested in Belet Hawa in 2002 Gu season was approximately 100 ha, almost all in the riverine maize-growing stretch alongside the Dawa River. The resultant production was negligible (6% of post-war average) and for poorer households, this not only represents lost food from their crops but more importantly, loss in income opportunities that would usually be available to them by

a more active growing and harvesting season. For the last four Gu seasons, sorghum production has been particularly poor, impacting negatively on the agro-pastoral groups' livelihoods. The poor cropping seasons over the last four years were augmented by drought conditions in 2001 that forced large numbers of livestock out of the area.

Outside of the significant urban population, the agro-pastoralists are believed to be the livelihood group most affected by the prevailing food insecurity. However, among all livelihood groups, households have suffered severe asset losses and the populations have shifted down through the wealth groups. This has happened in two ways: the criteria used to define each wealth group has moved downwards and the numbers of households in the lower wealth groups have increased, while that of the higher wealth groups have decreased.

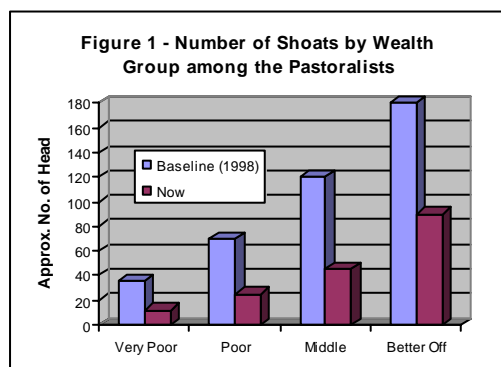


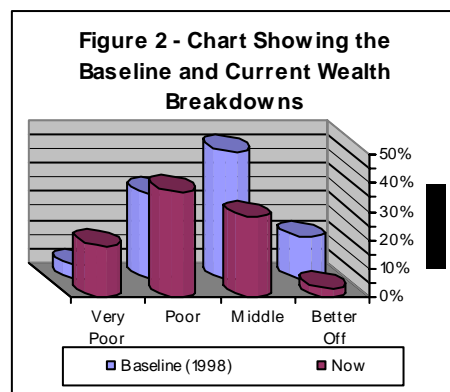
Figure 1 shows how pastoralists in northern Gedo from all wealth groups have lost shoats – similar pictures exist for other livestock. Fewer animals mean less milk and reduced livestock sales, the main productive element for this livelihood group. Not only are the numbers of animals possessed by households declining, the cattle and camel herds are still outside of the area, so their production remains inaccessible to the households in the district.

The biggest cause behind the drop off in assets is 'survival selling' – where households sell off poor quality animals for a low price, thus selling many more than they should to obtain the income they need. Other causes are

death from diseases (linked to poor animal condition) and the sale of the more productive animals (which the household needs to keep obtaining milk). Elders in the area reported that a similar picture exists for agro-pastoral households, although this Food Economy zone has not been investigated extensively enough to provide figures.

It is important to note that, by and large, animal and milk prices have been quite good, that is if the households under consideration are sellers and if their animals make the grades for which the prices are quoted. The reality is that the 'poor' and 'very poor' now have to purchase milk and none of their animals are in good enough condition to be classified 'export' or top 'local quality'.

The shift in wealth breakdown is shown in Figure 2—it is clear that now, the 'Poor' and 'Very Poor' households make up the majority of the population, whereas in the baseline year they were only about one-third.



Poorer households depend more on income earned through casual labour and collection/production activities than they do from production through their household assets. The drought and the loss of animals through sales or out-migration made life very difficult for this group by reducing the opportunities for agricultural and livestock labour. Labour supply and demand has pushed daily wage rates well below

3 Combined Sorghum and Maize

those found in neighbouring regions of Somalia --see the green line "Luuq" representing Northern Gedo in Figure 2. The recent insecurity, taking place during the growing season, has been particularly devastating for the 'very poor' pastoralists and agro-pastoralists as it has destroyed any possibility of work along the Juba River or in the main trading towns of Luuq, Belet Hawa and Dolow.

Large numbers of people in Gedo are expected to be vulnerable; if the 2002 Deyr rains fail once again, there will be a need for general free food distributions and for supplementary feeding for children. The former will require that a registration exercise be carried out again, while the latter should be as decentralised as is practically possible.

## 2.3 Historical Food Security and Nutrition Situation

Table 3: Summary of event affecting food security and nutrition in Belet Hawa district

<b>Factors influencing nutrition in Belet Hawa District</b>	
<b>Aug 2002</b>	Dependence of urban population on food aid documented (FSAU, Sept 2002).
<b>July 2002</b>	Return of the remaining displaced population to Belet Hawa from Mandera, Kenya
<b>April 2002</b>	Relatively good Gu rains leading to recovery of pasture and replenishment of water points
<b>March-June 2002</b>	Insecurity forced an estimated 15-20,000 Belet Hawa District residents seek refuge in Mandera, Kenya
<b>Feb 2002</b>	Arrival of some IDPs from Bardera District where there was fighting
<b>Dec 2001</b>	Diversification of the food basket/ration given by CARE (sorghum, lentils and oil) Commencement of therapeutic and supplementary feeding programmes by GHC/UNICEF Nutrition survey showing 37% Global Acute Malnutrition (W/H <-2 Z scores or oedema)
<b>November 2001</b>	Kenya-Somalia border reopening
<b>Sep-Oct 2001</b>	Failure of Deyr rains leading to continued drought in the district leading to severe water shortage and heightened food insecurity. Extremely high malnutrition figures from the CARE screening for the registration of beneficiaries for food aid. The number of eligible beneficiaries tripled following re-screening. Gu 2001 crop failure in the neighbouring Bay & Bakool regions (sorghum belt).
<b>Aug-Sep 2001</b>	Death of weak animals was reported
<b>July 2001</b>	Closure of the Kenya-Somalia border impacting negatively on trade.
<b>June 2001</b>	Return of IDPs from Mandera, Kenya to Belet Hawa, many having lost their belongings or exhausted their resources.
<b>May/June 2001</b>	Mass movement of livestock from Belet Hawa District and Gedo Region in general
<b>April 2001</b>	Cessation of SFP in Belet Hawa MCH
<b>March/April 2001</b>	Heavy inter-clan conflict in Belet Hawa leading to massive displacement of people from the area with subsequent disruption of the livelihoods. The poor were severely affected. Jilaal (dry) season continued with scarcity of water
<b>January 2001</b>	Movement of livestock towards Elwak and Luuq in search of water. Rising prices of milk leading to reduced consumption by the poorer households. People were mainly consuming sorghum. No rains received in the month, animals are generally weak due to poor pasture and inadequate water
<b>December 2000</b>	The MCH in Belet Hawa noted a high prevalence of malnutrition among children explained by food insecurity and incidences of ARI and diarrhoea. At least 30% of registered beneficiaries at MSF Spain –SFP in Mandera, Kenya originating from Belet-Hawa.
<b>2000</b>	CARE continuing with food distribution to vulnerable families, a project started in 1999.

<b>May 2000</b>	Belet Hawa District survey (UNICEF) (21.5% <=-2 z-score/oedema and 3.5% <=-3 z-score/oedema Shortage of water due to prolonged effect of the Jilaal season
<b>Feb-April 2000</b>	No rainfall received resulting in poor pasture and grazing conditions and deterioration in the quality of water. Increased sale of livestock recorded.
<b>1999</b>	Inadequate crop production for both Gu and Deyr rains owing to below normal rains in both the seasons.
<b>1997/98</b>	El nino flooding from October 1997 to February 1998 resulting in destruction of property including crops and near total collapse of economic infrastructure
<b>Early 1996</b>	Flooding of the Dawa river resulting in high incidences of malaria, and diarrhoeal outbreaks

## 2.4 Humanitarian operations in Belet Hawa District

### 2.4.1 Development Activities

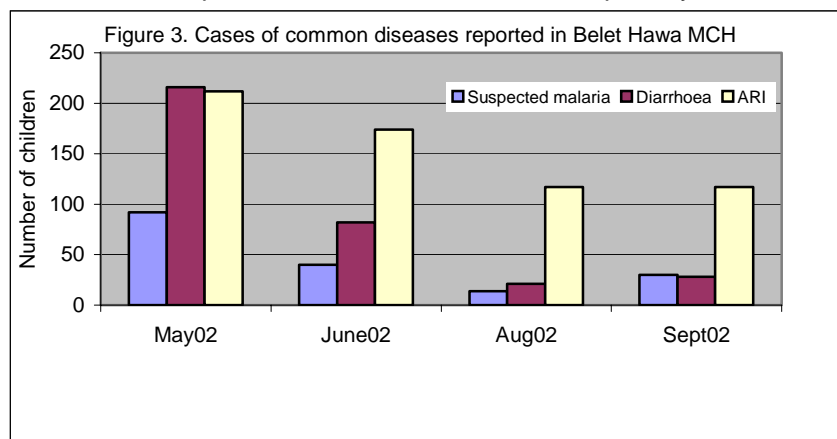
Although the district continues to experience crises that result in emergency interventions, Trocaire has continued to support longer term initiatives. In partnership with UNICEF, Trocaire sponsors education programmes in the district, which include construction and rehabilitation of schools, training of teachers and facilitation of the regular school operations. Besides that, Trocaire has also been involved in the support of income generating activities through the provision of micro credit to small-scale business persons and training. Following increasing pressure on the environment in the recent past, Trocaire has started a food security and environment conservation project.

### 2.4.2 Health

Trocaire, with support from UNICEF supported the delivery of health services in Belet Hawa District from 1992 until April 2001. This included at various stages, an integrated primary health care, outreach, supplementary feeding and support to the hospital. The outreach health service ceased in April 2001 following insecurity that had led to constant interruptions of operations and funding constraints. With deterioration of the nutrition situation in the district, outreach health and nutrition support activities were re-established by the newly formed umbrella organisation, Gedo Health Consortium. Throughout the past ten months, health service delivery and selective feeding activities have frequently been disrupted by insecurity. Insecurity has also placed significant constraints on access for supervision, recruitment of appropriately qualified staff and maintenance of supplies. Support to the hospital and MCH have continued.

### 2.4.3 Morbidity surveillance

Diseases like suspected malaria, diarrhoea and respiratory infections, are quite common in the district as

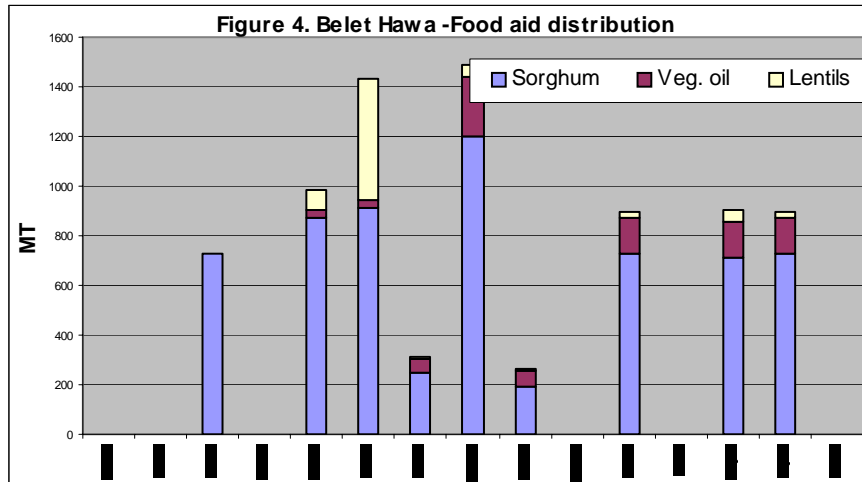


reflected in the graph below. Over 200 children with diarrhoea and an equal number with a diagnosis of acute respiratory disease were treated at Belet Hawa MCH in May 2002. Since May, the number of cases of diarrhoea and malaria appears to have decreased significantly. Around 40 cases of anaemia are reported each month. Recent insecurity has hindered access to the MCH in Belet Hawa town.

Due to the insecurity that has dominated the area for some months, interruptions of outreach services have been inevitable. This has led to limited access to health services by the population in some period. In January 2001, suboptimal childcare practices were reported in an FSAU mission report. Communicable disease such as tuberculosis are also reported to be common in Gedo Region.

### 2.4.4 General food aid

CARE Somalia has provided relief food, consisting of sorghum, in Belet Hawa District since 1999 through



four local NGOs. Until November 2001, CARE targeted the malnourished children, elderly, disabled and the internally displaced with sorghum distribution. From January 2002, CARE revised the food distribution targeting all households through the registration of all women of child-bearing age. The food basket was diversified to include sorghum, lentils and oil from December 2001. Between Dec 2001 and Sept 2002, CARE in Belet Hawa District

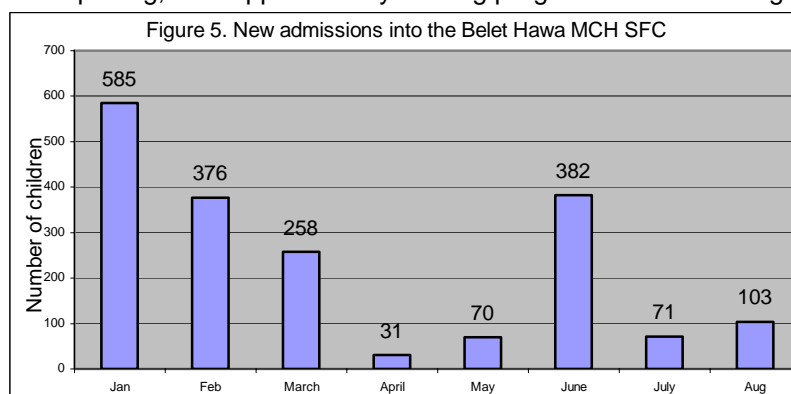
had distributed an estimated 7185MT as indicated in the graph. Using the Belet Hawa population estimates available, this quantity translates to roughly 11kgs per head each month capable of substantially contributing to the energy requirements<sup>4</sup> of individuals and households. Through supplementary feeding programme an estimated 165MT was distributed between December 2001 and October 2002 to the moderately malnourished children, pregnant and lactating mothers.

### 2.4.5 Selective Feeding

In December 2001 GHC established supplementary feeding and therapeutic feeding centres to cater for the moderately and severely malnourished children respectively. Also benefiting from the programme are pregnant and lactating mothers.

#### Supplementary Feeding Programme

After opening, the supplementary feeding programme admitted high numbers of moderately malnourished



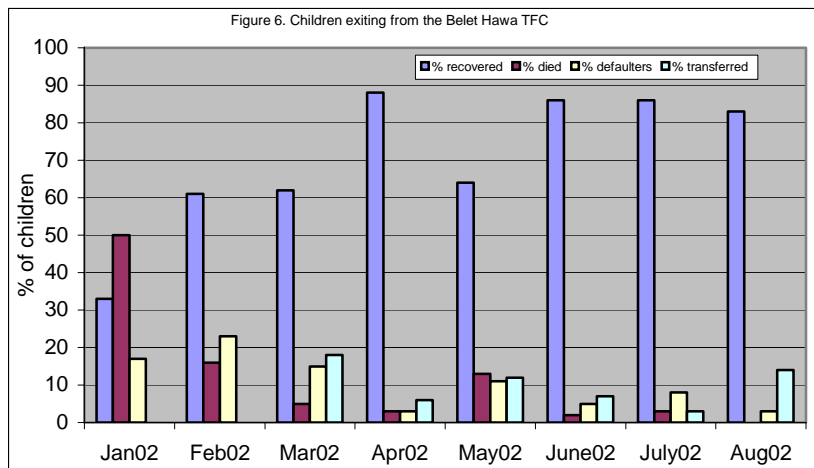
children and between January and August 2002 a total of 1876 children had passed through the programme (cumulative new admissions). In the months of April and May, admissions were temporarily hindered by insecurity with many of the town's population moving into Kenya as refugees. The insecurity greatly hampered outreach activities of the supplementary feeding programme. The children covered

<sup>4</sup> The ration monthly consisted of 8.4kg sorghum, 1.3kg oil, and 1.1kg of pulses capable of supplying a daily calorific intake of 995.7Kcal from sorghum, 384.5Kcal from oil and 126.0Kcal from pulses. This is a total of over 1500Kcal per person per day assuming equitable distribution of the ration to the Belet Hawa population.

by supplementary feeding programme represent a significant proportion of the malnourished children in the district. Based on the December 2001 nutrition survey the district had an estimated 3030 moderately malnourished thus implying a 62% SFP coverage<sup>5</sup>.

**Therapeutic Feeding Centre**

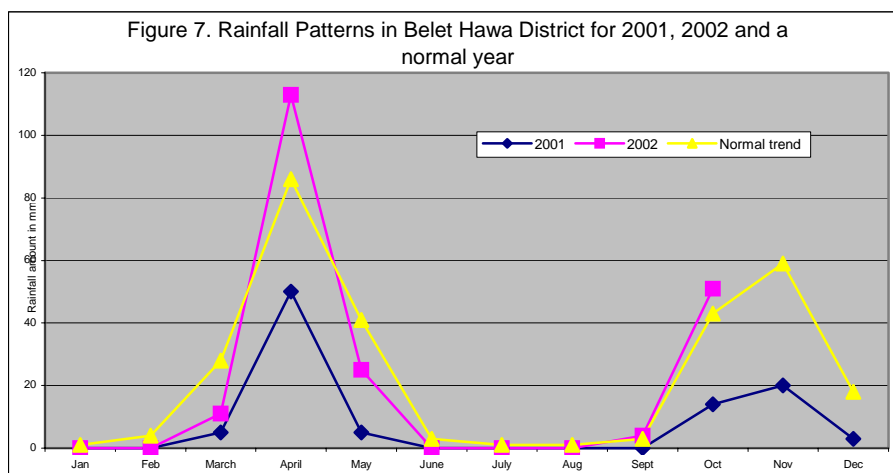
Gedo Health Consortium also operated a therapeutic feeding programme in which the number of admissions in a month (between January 2002 and August 2002) ranged between 30 and 120 children. Minimal re-admissions have been encountered. In terms of beneficiaries' response to treatment (see the graph), there were many deaths at the beginning of the programme (50% (n=6) of the total exits in January and 16% (n=5) in February).



The slight increase in deaths in May (13%, n=10) was attributed to absence of the implementing staff who had to flee due to insecurity. By August 2002 there was no death recorded in the TFC.

**2.5 Water and environmental sanitation**

An interagency assessment, carried out in January 2001, identified shallow wells as the main water source for Belet Hawa population. But due to persistent drought in the district most of these water points have dried up forcing household members to travel long distances in search of water. Livestock have equally suffered.



The river water also remained low and of poor quality. With the onset of the Gu 2002 rains (see the graph, courtesy of FEWS NET-Somalia), the water situation improved as the previously dry water points were replenished in April. According to FEWS NET, below normal rains were received between January 2001 and March 2002 and above normal during the Gu 2002 season.

Little or no rains were received between second dekad of May and early September 2002. At the time of the survey, Deyr rains had started. The price of water per 20 litre was about 2000 Ssh (0.1\$). Generally the sanitation in Belet Hawa is poor.

<sup>5</sup>In Dec 2001 survey a 61900 population size was used of which 28.8% of the 6-59 age category were moderately malnourished , thus target for SFP

## 2.6 Previous nutrition surveys in North Gedo

Over the past three years, nutrition surveys in Northern Gedo have persistently indicated poor nutritional status with Global Acute Malnutrition (W/H <-2 Z scores or oedema) not significantly less than 15% and most commonly around 20% as shown in the table below.

Exceptionally high malnutrition in December 2001 was accompanied by reports of high incidences of communicable diseases. About 67% of the children had experienced an episode of acute respiratory infection during the two weeks prior to the survey, 62% had diarrhoea while 46% had malaria. About 81% of the children had received Vitamin A supplementation in the previous six months and 43% had been immunised against measles. Over 21% of the children came from internally displaced households and returnee households with insecurity and food shortage being the main reasons for movement.

Limited food availability, poor childcare/feeding practices and high disease incidences were highly associated with the poor nutritional status of the population in Belet Hawa District.

Table 4: Summary of nutrition survey results conducted in Gedo Region

Date	Agency	Population or areas surveyed	< 80 % or oedema	<70 % or oedema	<-2 Z-Score or oedema.	<-3Z-Score or oedema.
07/96	Trocaire/Amref Memisa	Bulla Hawa	37.0%	10.0%	-	-
12/99	UNICEF	Bardera town	-	-	23%	5.5%*
04/00	ACF	Luuq town	8.8%	0.9%	14.9%	1.9%*
04/00	ACF	Luuq displaced	14.9%	1.8%	20%	4.2%*
5/00	UNICEF	Belet Hawa	-	-	21.5%	3.5%*
9/00	UNICEF	Burdhubo	-	-	17%	3%*
12/01	FSAU/UNICEF/CARE/GHC	Belet Hawa	32.5% (CI: 29.5% - 35.6%)	5.3% (CI: 4.0% - 7.0%)	37.1% (CI: 34% - 40.3%)	8.3% (CI: 6.5% - 10.1%)



## **3 METHODOLOGY**

### **3.1 Survey Design**

This study was both descriptive and analytical in nature. Using a standard questionnaire (see appendix) quantitative data were collected. Additional qualitative data were collected through focus group sessions and key informant interviews. Data collection took place between 18<sup>th</sup> and 22<sup>nd</sup> October 2002.

### **3.2 The sampling procedure**

Using a two-stage cluster sampling methodology, 30 clusters were randomly selected from Belet Hawa District. Initially a sampling frame was constructed from which a representative sample could be drawn. A list of villages, and sections in the case of Belet Hawa town, with their respective populations was used to construct cumulative population figures for the district. The population figures were initially received from the WHO population estimates. CARE, GHC and FSAU field teams verified these figures for authenticity. An estimated population of 66,481 (WHO, Sept 2002) was used from which a cluster interval of 2,216 was calculated. Using random number tables a random number of 1,281 was chosen within the cluster interval to determine the first cluster. The subsequent clusters were determined systematically by adding the cluster interval (2,216) to the first randomly selected number (see appendix). Due to inaccessibility (presence of mines), one of the randomly selected cluster/village (Shabeel Duulaa) could not be surveyed and was replaced by the nearest accessible village, Carre Asse that has similar basic characteristics with the selected village. From the 30 randomly selected clusters, a total of 917 children between the heights/length of 65 and 110cm and 6-59 months old were screened during the survey.

#### **3.2.1 Study population and sampling criteria**

The study population consisted of people living in the district and comprised all the children aged 6-59 months or measuring 65-110 cm for height/length. On the visit to each cluster, the centre was identified and a pen was spun to determine the direction to follow in the selection of the households with children aged 6 to 59 months. The total number of the households from the centre to the end was established and given numbers to enable random selection of the first household with a child of the required age or height. From the first household with a child aged 6-59 months, the same direction was followed to get the next household. On reaching the edge of the cluster the right-hand direction (clockwise direction) was followed until details of 30 children were collected from that cluster. If a cluster was exhausted of children before the required 30 children had been reached, a neighbouring area was randomly selected. All eligible children in the household were measured and if a child or primary caregiver was absent, an appointment was booked for a later visit in the course of survey. If a child was in a therapeutic feeding centre or hospital, endeavour was made to take the measurement at the clinic or at the hospital.

### **3.3 Data collection**

#### **3.3.1 Anthropometric measurements**

The anthropometric data were collected using the procedure stipulated by the WHO (1995) for taking anthropometric measurements. Adherence to this procedure was ensured. The protocol used was as follows:

*Weight.* Salter Scale with calibrations of 100g-unit was used. This was adjusted before weighing every child by setting it to zero. The female children would be lightly dressed before having the weight taken while clothes for the male children were removed. Two readings were taken for each child and the

average recorded on the questionnaire.

*Height.* For height, a vertical or horizontal measuring board reading a maximum of 175cm and capable of measuring to 0.1cm was used to take the height or length of a child. The child would stand on the measuring board barefooted; have hands hanging loosely with feet parallel to the body, and heels, buttocks, shoulders and back of the head touching the board. The head would be held comfortably erect with the lower border of the orbit of the eye being in the same horizontal plane as the external canal of the ear. The headpiece of the measuring board was then pushed gently, crushing the hair and making contact with the top of the head. Height/length was then read to the nearest 0.1cm. Two readings were recorded and the computed average used in the analysis.

*Length.* For children aged 6 to 24 months or between 65cm to 84.5cm length instead of height was taken. The child was made to lie flat on the length board. The sliding piece was placed at the edge of the bare feet as the head (with crushing of the hair) touched the other end of the measuring device. Then two readings were taken and the average computed.

### **3.3.2 Child age determination**

Difficulties were encountered in determining the exact ages of children. Useful documents like growth monitoring/clinic attendance cards, or any other viable formal card were used when available. Calendars of events (see in the appendix) were also used as proxies to accurate age determination. Though not entirely accurate, ages were still regarded as important indicators though not used for anthropometric analysis and were approximate/average pointers. The nutrition indicator employed was *weight for height* as interest was in the wasting status (acute malnutrition).

### **3.3.3 Oedema**

Defined as bilateral oedema on the lower limbs detected by gently pressing the feet to check if a depression is left after at least three seconds of pressing.

It is notable that all severely malnourished children identified during the data collection process were referred to Belet Hawa Therapeutic Feeding Centre.

### **3.3.4 Morbidity**

***Diarrhoea:*** Diarrhoea was defined for a child having three or more loose or watery stools per day.

***Measles:*** A child with more than three signs of the following was considered having measles: fever, and skin rash, runny nose or red eyes, and/or mouth infection, or chest infection

***Acute Respiratory Infection (ARI):*** Asked as *oof wareen or wareento*. The signs asked included cough, rapid breathing and fever.

***Suspected malaria/acute febrile illness:*** The signs to be looked for are periodic chills, fever, sweating and sometimes a coma.

### 3.3.5 Mortality

The mortality data was collected retrospectively. Each household surveyed was asked the composition of their members in two parts: (i) those members less than 5 years and (ii) the total number of household members. The household was then asked how many if any of the household members had died in the last one year. *A household with no under-five child at the time of the survey, even if one had died, was not included in the survey*<sup>6</sup>

However, the data generated was not used for analysis due to methodological limitation. The raw data is available at FSAU.

## 3.4 Description of survey activities

**Table 5: Chronology of activities for the Belet Hawa nutrition survey**

Major Activity	Dates. 2002
Preparation of tools, methodology & review of secondary data (Nairobi)	October 8 - 11
Training of enumerators and pre-testing (Mandera, Kenya and Somalia)	October 14 - 17
Cluster Identification	October 17
Collection of data	October 18 - 23
Entry of data and preliminary analysis	October 24 - 30
Presentation of preliminary results	October 31
Circulation of report	November 12

Six teams consisting of two enumerators and one supervisor conducted the survey with each team handling one cluster in a day. An elder from a particular village/cluster assisted the teams in identification of the cluster and its centre. Supervisors were seconded from the participating NGOs; namely; Gedo Health Consortium, WHO, CARE and FSAU. Overall support, supervision and co-ordination was done by two FSAU nutritionists. Gedo Health Consortium assisted in the identification of the qualified enumerators who were selected on the basis of their experience with previous nutrition surveys and multi-indicator cluster surveys (UNICEF). In addition CARE and GHC gave logistical support.

## 3.5 Quality control procedures

A comprehensive training of enumerators and supervisors was conducted covering interview techniques, sampling procedure, inclusion and exclusion criteria, sources of errors taking of measurements, standardising the questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema, handling of equipment, interview techniques and the general courtesy during the survey.

Rigorous standardisation of measurement and pre-testing of the questionnaire and equipment was carried out in one of the villages (not selected for data collection). Standardisation involved taking repeated measurement of 10 children by all the teams and comparing with some reference. Pre-testing also involved familiarising survey teams with village/cluster entry; administering the questionnaire, sampling procedure, correct taking of measurements and documentation. After the field exercise, views were exchanged to address the difficulties identified, appropriateness of the questions reviewed and necessary changes were made.

Quality of data was also ensured through (i) close monitoring of fieldwork by FSAU nutritionists, (ii) crosschecking of filled questionnaires on daily basis and (iii) daily review undertaken with the

<sup>6</sup> In surveys designed for the collection of data on mortality, all households should be included, as a household with no children could indicate that a child or children had died prior to the survey. Mortality data generated using the methodology described here is therefore likely to be an underestimation of the actual rate.

enumerators 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 after entry in the field that made it easy to detect any outliers/ mistakes and to replace or repeat households depending on magnitude of error and (vi) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights.

## **3.6 Data analysis**

### **3.6.1 Entry, cleaning, processing and analysis**

Data was entered and analysed using EPIINFO computer based package. Running and tabulating all variable frequencies was carried out as part of data cleaning. The EPINUT programme was used to convert the measurements (weight and height) into nutritional indicators and comparison made with the National Centre for Health Statistics (NCHS) references as designed by WHO (1983).

### **3.6.2 General characteristics of study population**

Frequencies and cross-tabulations were used to give percentages, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics.

### **3.6.3 Creation of nutritional status indices**

The anthropometric measurement of weight and height were used to compute the W/H nutritional status indicators of the studied children. Weight For Height (W/H) expressed the weight of the child as a percentage of the expected weight for the standard child of that height as given by NCHS. WFH measures acute malnutrition or wasting. Using EPINUT Z-scores were generated and the anthropometric indicator, WFH, was used to classify children into categories of nutritional status as follows:

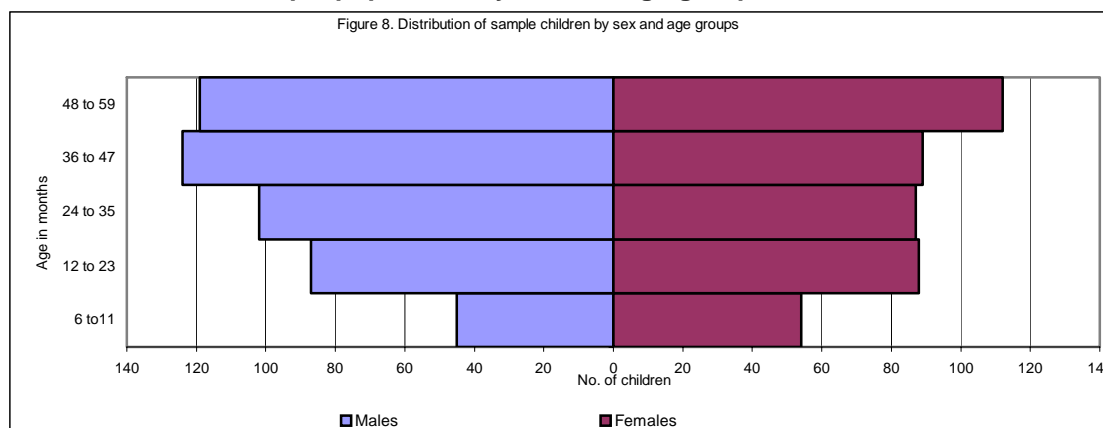
- < -3 Z-Scores or oedema = Severe acute malnutrition
- 3 Z-Scores  $\leq$  WFH < -2 Z-Scores = Moderate acute malnutrition
- < -2 Z-score or oedema = Global/total acute malnutrition
- $\geq$  -2Z-Scores = Normal

## 4 SURVEY RESULTS

### 4.1 Characteristics of the study population

A total of 917 children were surveyed. However, at data analysis level, 10 cases had some erratic values or were missing some key questions for analysis, thus the analysis were conducted on 907 children. The children came from 517 households randomly selected from Belet Hawa District. About 52.6% (n=477) of the children were males while 47.4% (n=430) were females. The difference in proportions was not statistically significant. Most of the children came from male-headed households (81.5%) and the remaining 18.5% came from female-headed households. The mean household size for the Belet Hawa District was 7 (SD=2.3).

#### Distribution of the sample population by sex and age groups



About 10.5% (n=95) of the children came from households which were either internally displaced or returnees with the remaining 89.5% (n=812) coming from permanent residents. Insecurity was the main reason for the movement of the IDPs and returnees to their new residence/ location as indicated in the table below. It is noted that population movements were more common in 2001 than in the present survey, an indication that people are starting to settle down.

**Table 6: Reason for movement to current residential village**

Reason	Proportion	Number (N=93)
Insecurity	84.9	79
Food shortage	15.1	14

## 4.2 Food sources, income sources and coping strategies

**Table 7: Current socio-economic status of the study population**

Most of the surveyed children came from households relying on purchasing (52.5%) and food aid (29.5%) as the main food sources. About 11.7% of the children were from households whose main source of food is livestock. Other sources include wild foods collection including hunting, begging, and receiving food as gifts. Food security information confirms a significant shift in the peoples' livelihood patterns throughout Belet Hawa District.

Casual work, sale of bush products (collection of firewood, building poles, and charcoal) and sale of livestock are the main sources of income in Belet Hawa with 52.6%, 22.7% and 12.1% of the children coming from household relying on those sources respectively.

## 4.3 Water and sanitation

As indicated in Table 7 open well, berkads and stream/river were the main water sources for the Belet Hawa residents. About 43% of the children came from households relying on open wells for water.

Presence of toilet is uncommon with only 27.1% of the children coming from households accessing toilet. All these children came from households in Belet Hawa town. None was from the rural villages of Belet Hawa.

		No.	%
<b>Main food source</b>	Purchasing	477	52.5
	CARE-food aid	268	29.5
	Animal products from own herd	106	11.7
	Crop production	18	2.0
	Wild foods collection	17	1.9
	Begging	16	1.8
	Remittance/gift	5	0.6
<b>Main income</b>	Casual work	477	52.6
	Sale of bush products	206	22.7
	Sale of livestock & their products	110	12.1
	Small business	57	6.3
	Others (salaried employment, sale of crops, remittances, sale of food aid)	57	6.3
<b>Coping strategies-</b>	Borrowing	344	37.9
	Food aid	129	14.3
	Bush product collection	96	10.7
	Wild food collection	76	8.4
	Sale of livestock	75	8.3
	Purchases	64	7.1
	Others (remittances, family splitting, begging, casual work)	123	13.6
<b>Water source-</b>	Open/unprotected wells	386	42.6
	Berkads	302	33.3
	Stream/river	207	22.8
	Catchments/pond/borehole	12	1.3
<b>Toilet</b>	With access to toilet	246	27.1
<b>First source of assistance during illness</b>	Public health facilities	610	67.4
	Traditional healers	193	21.3
	Private clinic	91	10.1
	Prayers	11	1.2

#### 4.4 Health services

The carers of 67% of children consider public health facilities as the first option when the children are sick. The carers of a further 31% choose traditional healers and private clinics. The public health facilities include the MCH and the health posts supported by the Gedo Health Consortium and UNICEF. Private clinics were only accessed by the urban residents and population in the neighbouring villages.

#### 4.5: Nutritional status

The results of the anthropometric analysis were obtained by using weight-for-height expressed as z-scores and percentage of the median of the reference population.

**Table 8: Malnutrition prevalence using W/H Z-score categories**

Z SCORES						
Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
<b>Total malnutrition</b> (W/H<-2 z score)	23.6 (95%CI: 18.4-29.6)	114	19 (95% CI: 13.9-25.1)	80	<b>21.4</b> <b>(95%CI: 17.7-25.6)</b>	194
<b>Severe malnutrition</b> (W/H<-3 z score)	2.9 (95% CI: 1.5-5.4)	14	1.2 (95% CI: 0.4-3.3)	5	<b>2.1</b> <b>(95% CI: 1.2-3.6)</b>	19
Oedema	0.1	1	0	0	<b>0.1</b>	1
Std prevalence <sup>7</sup>	52.8%		47.2%		50.1%	

**Table 9: Malnutrition prevalence using W/H percentage of median categories**

PERCENTAGE OF THE MEDIAN						
Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
Total malnutrition W/H<80% of the median)	16.5 (CI. 12.3-20.2)	80	13 (CI. 9-18.3)	55	14.9 (CI. 11.9-18.5)	135
Severe malnutrition (W/H<70% of the median)	0.8 0.2-2.4	4	0.7 (CI. 0.2-2.4)	3	0.8 (CI. 0.3-1.7)	7
Oedema	0.1	1	0	0	0.1	1

The data showed that slightly more males were malnourished than females in both categories of malnutrition. As shown in Table 8 above, 21.5% of the surveyed children were considered malnourished with a weight for height of less than -2 z-score (21.4%) plus oedema (0.1%). The prevalence of severe malnutrition (*included in the total malnutrition*) was 2.2% (2.1% with weight for height z-score value of less than -3 plus oedema 0.1%). The malnutrition rates were 14.9% and 0.8% for total and severe acute malnutrition, respectively, using percentage of the median references.

<sup>7</sup> Proportion of children from the surveyed population falling outside the reference population's normal curve

**Table 10: Summary of Global Acute malnutrition and Severe Acute Malnutrition in Belet Hawa District**

Malnutrition Rates	Proportion	No.
Global Acute Malnutrition (<-2 Z score or oedema)	21.5% (CI: 18.9-24.5%)	195
Severe Acute Malnutrition (<-3 Z score or oedema)	2.2% (CI: 1.4-3.4)	20

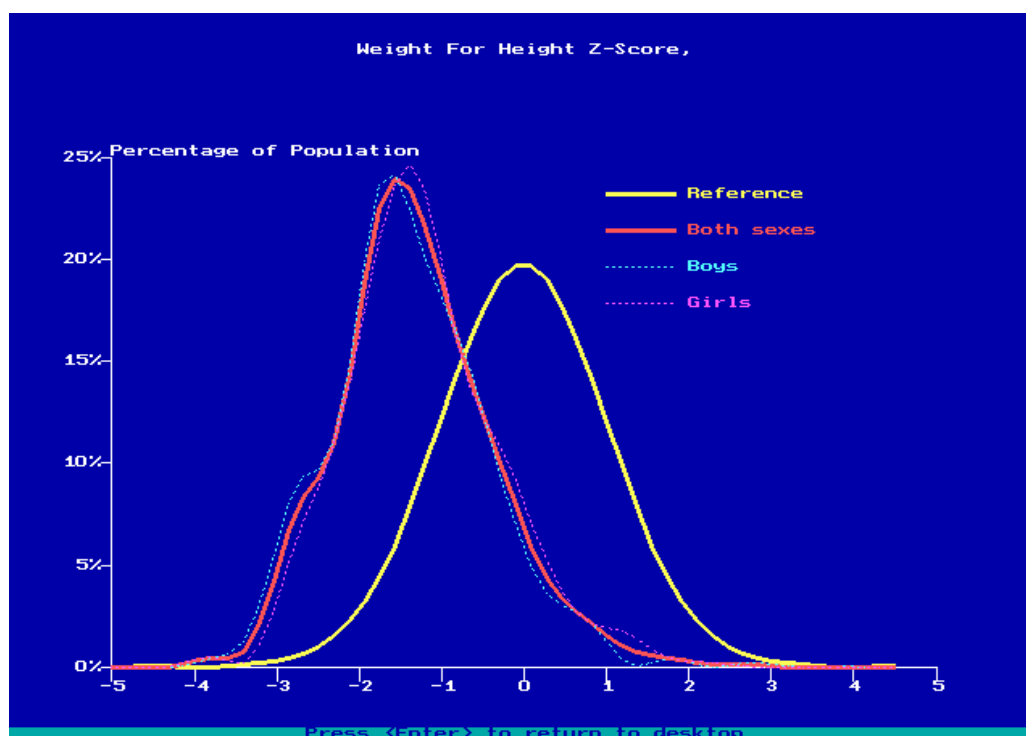
**Table 11: Distribution of nutritional status (using weight for height z-score) by sex**

	Severe	Moderate	Total malnutrition	Normal
Males	13 (2.7%)	97 (20.4%)	110 (23.1%)	367 (76.9%)
Females	7 (1.6%)	78 (18.2)	85 (19.8%)	345 (80.2%)
Total	20 (2.2%)	175 (19.3%)	195 (21.5%)	712 (78.5%)

Although the results indicate that slightly more males were malnourished than females, this difference was not statistically significant (meaning that the slight

difference could be caused by chance alone.)

**Figure 9. Prevalence of wasting in Belet Hawa District**

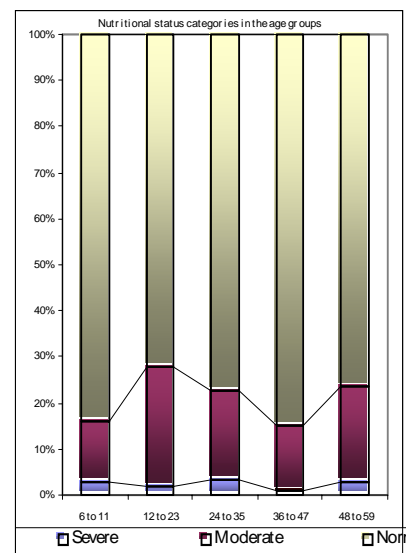


The distribution of weight for height index expressed in z-scores is shown to the left of the reference population. This indicates that nutritional status of the entire Belet Hawa population is significantly worse than the reference population. The mean (*average*) weight for height index is -1.36 and the median (representing the mid point value – 50% of the population above this point and 50% below) is -1.31. The standardised prevalence of malnutrition is 50.1% with the distribution to the left. (The proportion of children whose z-score status does not overlap the reference population). This indicates that more than half of the population falls outside the reference values indicating the degree to which the nutritional status of the population has negatively shifted.



**Table 12: Nutrition status using weight for height z-scores according to age groups**

Age groups	Severe	Moderate	Total malnourished	Normal
6-11 months	3 (3%)	13 (13.1%)	15 (16.1%)	83 (83.8%)
12-23 months	3 (1.7%)	46 (26.3%)	49 (28%)	126 (72%)
24-35 months	6 (3.2%)	37 (19.6%)	43 (22.8%)	146 (77.2%)
36-47 months	2 (0.9%)	30 (14.1%)	32 (15.0%)	181 (85.0%)
48-59 months	6 (2.6%)	49 (21.2%)	55 (23.8%)	176 (76.2%)
<b>Total</b>	20 (2.2%)	175 (19.3%)	195 (21.5%)	712 (78.5%)



Children between ages 12 and 23 months indicated significantly higher levels of malnutrition (28%) than other age groups (p-value <0.04).

**Table 13: Nutrition status using weight for height z-score by food economy group**

	Malnourished <-2 Z score or oedema	Normal >=-2 Z score	Total children	Observed mean	Standard deviation
Agro pastoral	71 (26.6%)	196 (73.4%)	267 (29.4%)	-1.501	0.88
Pastoral	38 (17.8%)	176 (82.2%)	214 (23.6%)	-1.223	1.141
Urban	77 (21%)	289 (79%)	366 (40.4%)	-1.23	0.991
Riverine	9 (15%)	51 (85%)	60 (6.6%)	-1.06	1.034
<b>Total</b>	195 (21.5%)	712 (78.5%)	907 (100%)	-1.36	0.94

The results indicate that there appears to be no difference in malnutrition between children in the various food economy groups. However, the findings also indicate that there is a high level of malnutrition among children from agro-pastoral households than from any other food economy group. The mean weight for height z-score measurement was negative for all the food economy groups indicating a shift to the worse for all livelihoods. Still, children from the agro-pastoral households had an extreme negative mean than any other group.

#### 4.6.1 Health, feeding practices and immunisation coverage

Table14 : Disease prevalence, immunisation and childcare in Belet Hawa District

Characteristics	Proportion	Number
<b><i>Disease prevalence &amp; immunisation (N=905)</i></b>		
Children with acute respiratory infection two weeks prior to the survey	20.6	186
Children with diarrhoea two weeks prior to the survey	25.9	234
Children with malaria/febrile illness two weeks prior to the survey	23.4	212
Children with measles two weeks prior to the survey	10.8	98 <sup>8</sup>
<b><i>Child feeding</i></b>		
<b><i>Frequency of feeding in a day(N=905)</i></b>		
• Once	1.8	16
• Twice	25.3	229
• 3-4 times	62.7	568
• Five and above	10.2	92
<b><i>Age of stopping breastfeeding (N=718)</i></b>		
• Less than 6 months	7.8	56
• 6-11 months	8.9	64
• 12-18 months	19.6	141
• Above 18 months	63.7	457
<b><i>Age introduced foods other than breast milk</i></b>		
• Less than 3 months	97.7	884
• Less than 6 months (inclusive of less than 3 months)	99.0	896
• Above 7 months	1.0	9

- About 21% of the children surveyed had acute respiratory infection two weeks prior to the survey, 26% had diarrhoea and 23% had malaria.
- Incidences of suspected measles two weeks prior to the survey were high at around 11%. The survey coordinators and GHC supervisor verified about ten of these children to have suffered from suspected measles in the two weeks prior to the survey.
- Results of measles immunisation collected through card verification and recall indicate that about 72% of the children eligible for vaccination (9 months and above) had been immunised within the six months prior to the survey. However, it is notable that immunisation of children from the pastoral households was dramatically lower at less than 40% coverage. Coverage within the town was the highest at about 80%.
- Vitamin A supplementation was about 88%. The coverage was lower for children from pastoral households (82%) than children from other livelihood groups (for example the coverage in the riverine villages was about 97%.)
- About 27.1% of the children are fed once/twice in a day with around 90% of the children receiving food four times or less in a day. Only 10% of the children are fed five times or more in a day.

8- Out of the 98 measles cases identified, only 9 were confirmed by the FSAU nutritionists, who co-ordinated the survey

- At the time of the survey, 20.7% of the children surveyed were breastfeeding.
- About 36.4% of the surveyed children stopped breastfeeding before or at 18 months of their life while about 16.7% of the children stopped breastfeeding at the age of less than one year.
- Exclusive breastfeeding was uncommon with 98% of the children being introduced to foods or fluids other than breast milk during the first three months of life.

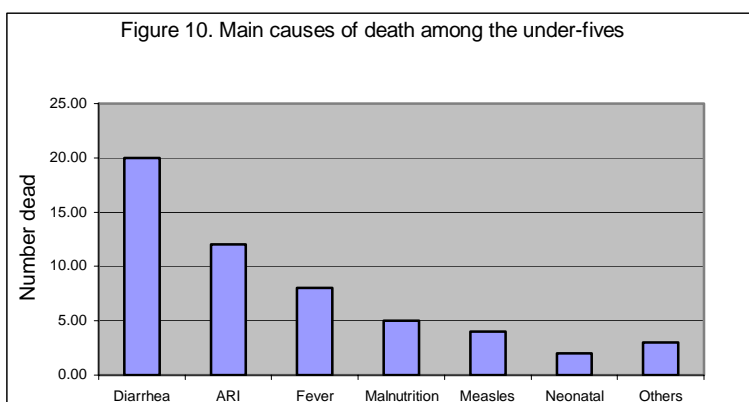
#### 4.6.2 Relationship between malnutrition and other factors

- There was statistically significant association between nutrition status and the frequency of feeding ( $p=0.023$ ). Children who fed less than four times in a day show higher chances of being malnourished than children fed five or more times (these children were two times more likely to be malnourished than those fed more frequently). It appears that households from the agro-pastoral fed their children less frequent than other households. Only 5% of children from agro-pastoral households were fed five times or more a day while other food economy groups had more than 10% of their children feeding five or more times a day.
- There was a significant association between malnutrition and diarrhoea with children who had incidence of diarrhoea in the two weeks prior to the survey being about 1.8 times more likely to be malnourished than children who had no incidence of diarrhoea (OR: 1.75, CI: 1.22-2.51, Mantel-Haenszel  $p=0.0011$ ).
- Children who had suffered from malaria/febrile illness in the two weeks prior to the survey were 1.4 times more likely to have been malnourished than their counterparts. This was significant at OR=1.43, CI: 0.98-2.07,  $p$ -value=0.048).
- Incidences of measles two weeks prior to the survey appeared to be significantly higher in the pastoral families than any other food economy group.
- There was no significant relationship between malnutrition and acute respiratory infection, measles, age at stopping breastfeeding, age of introduction of weaning foods, Vitamin A supplementation, measles vaccination, residential status, access to toilet facilities and source of drinking water.

### 4.7 Mortality Data

#### Main cause of death among under-fives

Diarrhoea was the leading cause of the death among the under fives followed by ARI. The respondents also mentioned malnutrition as a significant cause of death. It is notable that some children presented more than one complication, however, the dominant one was the one reported.



## 4.8 Qualitative information

Qualitative information, acquired through focus group discussion with mothers of children under five and other key informants in Belet Hawa, indicates that care of children and women has been strongly influenced by insecurity and drought in Belet Hawa District, as well as by the more chronic structural problems that have significantly and negatively affected the livelihoods of most households.

The residents report that reduced income from livestock and crop production has led to a search for alternative sources of income. Many of the poor and middle-income groups have turned to collection of bush products with an increased involvement of women. In many households, women have become the main breadwinners, and are engaged in such activities as the collection of firewood for sale, with the better off using donkeys and the poorer women carrying heavy loads on their backs. Meanwhile men are involved in casual labour and taking care of any assets available, mainly livestock. This gruelling activity also involves spending increasing lengthy periods of time away from home and from young children. With many women also responsible for fetching water for domestic use, increasing amounts of time have been spent away from the home during the recent droughts. Combining these additional tasks with the normal household tasks of cooking and cleaning, many women described being constantly exhausted and having little opportunity to consider their own health or welfare. Many therefore report that many infants and young children are spending increasing amounts of time in the care of siblings or neighbours. Breastfeeding on demand and other basic childcare practices are negatively affected.

Focus group discussions also confirmed previous reports<sup>9</sup> that during pregnancy, many women reduced the frequency of consumption of protein rich food (milk and meat) as a means of controlling foetal growth. Women understand that having a larger baby is likely to result in a more difficult delivery, which in the absence of adequate obstetric services could be catastrophic for mother or baby, or both.

While mothers in rural areas described the distance to health services (the MCH and hospital in Belet Hawa town) as being a major issue in seeking care, the current supplementary feeding, that targets the lactating and pregnant women through the Belet Hawa MCH has acted as an incentive for women to attend and to benefit from antenatal and postnatal care.

Introduction of other foods other than breast milk, mainly sugar solution, within the first two days of life for the child and discarding of colostrum is a common practice in the Somali culture. Breastfeeding is stopped immediately when a mother becomes pregnant again. The principle weaning foods for infants consist of porridge (made from sorghum flour), tea and milk. Belet Hawa residents also report that in the past one year, milk has been very scarce due to the movement of livestock from the district and the poor condition of the remaining animals. The better off households, mainly in the urban areas, have switched to using powdered milk. The use of fruit and vegetables is not common.

Most of the adults report consuming one or two meals in a day. Preferences are given to children for food consumption with most families reporting making sacrifices to feed their children three or more times a day. In recent years, food access in terms of quantity and variety has reduced in most households.

Food preparation and hygiene standards at food preparation level are inadequate. Simple ideas like covering of food are reportedly overlooked by most households. Hygiene standards are low with most households not accessing toilets. Most times the water availability is low and poor in quality.

It was reported that the children are given food first then the other household members follow later.

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<sup>9</sup> Food Utilisation in Somalia. FSAU. 2002

## 5 DISCUSSION

This section examines some of the issues that contribute to the consistently high levels of acute malnutrition in Belet Hawa and also aims to explain factors that are likely to have caused the significant improvement in nutritional status since the previous survey in December 2001. Belet Hawa District was surveyed on this occasion not because it was more vulnerable than other districts in Northern Gedo but because it provided marginally better security for the brief period required to undertake the data collection. Overland access was possible from Kenya, which was used as a base for non-Somali team members. It was also necessary to evaluate the likely impact of the combination of positive factors, (substantial humanitarian interventions, including food aid and the return of some animals) and negative factors (insecurity, depleted asset levels, insufficient rains in some areas). The relatively high population density in relation to other districts of Gedo and other parts of Somalia also makes Belet Hawa a prime area of focus.

### 5.1 Food sources, income and coping mechanisms

The precarious food security situation in Belet Hawa and other parts of northern Gedo has been well analysed and acknowledged in recent years. FSAU describes substantial deficits in food production in the region in the past three years. Rainfall charts and satellite images have shown reduced pasture and browse for all livestock – previously the main source of livelihood in the district. Poor rainfall resulted in serious depletion of water sources and increased prices. Consequently, most livestock moved out of the district towards the south mainly towards Middle and Lower Juba Regions. Access to cereals was greatly reduced as crop production even along the Dawa River was either non-existent or far below normal and availability had occasionally decreased as a result of the frequent insecurity incidences that hindered transportation of cereals from neighbouring districts. For a district that had a long history of dependence on food aid, the distribution of sorghum alone up to December 2001 did not allow poorer households to meet their basic nutritional requirements. In December 2001 therefore the food security situation was considered critical and this was confirmed by a nutrition survey which showed a malnutrition rate of 37% W/H <-2 z-scores.

#### Humanitarian interventions

From December 2001, CARE expanded food aid interventions, introducing pulses and oil to the food basket and aiming for distribution to all households through the adult female household members. Theoretically, 73% of household kilocalories needs were met by this ration taking in the period December 2001 to November 2002. This calculation is based on an average household size of six, a daily energy requirement of 2,100 Kcal per person, no significant losses occurring, all the food remained in the district and no food fed to livestock. In reality, it is therefore more likely that the average Kcal intake was much lower as food was certainly fed to livestock at times and the survey results showed an average household size of seven.

In January 2002, Gedo Health Consortium recommenced supplementary and therapeutic feeding. The supplementary feeding programme distributed Fortified Blended Food and oil to malnourished children, pregnant and lactating mothers in Belet Hawa town as well as some villages. Health care and immunisation was also offered during screenings and distributions. The therapeutic feeding centre in Belet Hawa treated severely malnourished children.

#### Food security since December 2001

The Gu 2002 rainfall between April and June was described as relatively good and many dry water points were replenished. Some but not all livestock returned to the district with riverine areas currently hosting substantial numbers. Milk availability and access has improved but is still low. Recovery of pastures currently taking place creates prospects for calving and kidding of the available herd.

There has also been increased exchange of commodities between Mandera, Kenya and Belet Hawa as well as other regions of southern Somalia with Belet Hawa during the relatively short peaceful times in the current year. This has been manifested in decreased prices of essential food items and the availability of food commodities in the Belet Hawa market.

### **Changes in livelihood patterns**

It is significant to note that household livelihood patterns have changed significantly in Belet Hawa since the establishment of baseline data in 1998. For example, due to the massive loss of the livestock, through death, sale at low prices and population's reduced access to their livestock as the livestock moved away in the previous protracted droughts, many of the poorer household's previously practicing pure pastoralism have shifted towards agro-pastoralism. An equally significant proportion of the previously pastoral or agro-pastoral households now increasingly rely on urban related livelihood sources. The short and longer term effects of these observations require further understanding and analysis. It is hoped that this will be undertaken in the coming months.

### **Coping mechanisms and effects of insecurity**

The continuing insecurity in Belet Hawa District has not only disrupted the delivery of humanitarian assistance but has also greatly hampered the maximum exploitation of coping mechanisms that are used in other dominantly pastoral areas.

Many households report being unable to move freely from one area to another so although population movement is still common, it appears to be used as an extreme measure to preserve lives (the findings indicate insecurity or food shortage as the main reason for movement of the displaced people in the survey) rather than as an option for maintaining livelihoods.

The shift in proportions in households in the various wealth groups is important. A reduction in the proportion 'better-off' and 'middle' wealth groups creates an overall weaker social support system for lending and exchange of gifts – basically, a higher proportion of poorer households now seeks assistance from fewer better-off households. Employment opportunities are also likely to be reduced. However, borrowing though limited, remains the major coping strategy for households in the district.

Another traditionally important coping mechanism, increasing the sale of livestock and other animal products is currently considered less important in terms of household income contribution.

A significant proportion of households surveyed also report either bush products or wild food collection as alternative ways of coping. Also demonstrating increased stress in this population is the fact that activities such as the collection of bush products have graduated from a coping strategy to a main source of income with casual employment and collection of bush products now the main income source for over 75% of the population. The recurrent droughts and the massive exploitation of forests for bush products, however have disastrous effects on an already stressed and degraded environment.

The destruction of private property and frequent attacks also leads to unwillingness to invest in simple infrastructure such as maintenance and support of health services and water resources.

Management of water sources in Belet Hawa continues to be problematic for both humans and animals. However, for a population currently preoccupied with survival and security, long term strategies to ensure adequate and safe water for both humans and livestock are not a priority.

## 5.2 Health issues influencing nutritional status of Belet Hawa population

### Morbidity

Belet Hawa District has one hospital, one MCH and several health posts, some of which are used as supplementary feeding points. The reported disease prevalence during the two weeks prior to the survey of 21% ARI, 26% diarrhoea and 23% suspected malaria were lower than the rates reported in the Dec 2001 nutrition survey. The incidence of measles at 11% was higher than last years reported incidence. Diarrhoea, acute respiratory infection, suspected malaria and anaemia are also some of the common diseases frequently reported at the MCH and the hospital in Belet Hawa District although a steady decline was noted in the number of cases reported during the May to September 2002 period.

According to the survey results, there was statistically significant relationship between malnutrition and malaria and diarrhoea, independently. Children with diarrhoea were 1.8 times more likely to be malnourished than children without diarrhoea and children with malaria were 1.4 times more likely to be malnourished than those without malaria. Diarrhoea, ARI and malnutrition were also given as the principle causes of death among children under five years in Belet Hawa District (GHC MCH figures). In addition, significant deaths were reported in TFC in January and February 2002.

### Sanitation

The majority of the households surveyed did not have access to means of sanitary disposal of faeces – this is a particularly problematic issue for the urban and peri-urban households. The overall access to safe water has been reduced due to scarcity, increased cost and poor maintenance of some water points. The use of water from the unprotected wells and river Dawa predisposes the population to increased risk of communicable diseases and malnutrition. Sanitation therefore is still a major underlying cause of malnutrition in the district.

Measles immunisation coverage has risen in the past ten months from 43% (December, 2001 survey) to 72% among 9-59 months age category. The rise in the measles coverage is attributed to the ongoing systematic treatment (where the vaccine is part of the package) in the supplementary feeding programme (SFP). Also high is the Vitamin A supplementation coverage (88%) a result attributed to both SFP and the WHO Polio/ Vitamin A supplement administration. This has an overall effect of enhancing the population immunity.

## 5.3 Childcare and its effect on nutritional status

Compromised childcare in Belet Hawa District is likely to be a significant factor in analysing the continued high malnutrition recorded in this survey. The period of drought, food insecurity and shifts in livelihoods is reported to have resulted in a reduction of time spent by mother from poorer households with her young children. This is particularly important for the breastfeeding of children under six months who are unlikely to be breast-fed on demand are more likely to receive foods other than breast-milk. Women have become increasingly involved in coping strategies such as bush product collection and have spent greater amounts of time travelling long distances to fetch water. Food intake and utilisation are usually enhanced by correct cooking techniques, feeding time and frequency, psycho-social state of the child, hygiene standards, combination of foods given (variety) among other factors. In view of the reported frequent delegation of childcare to young siblings, some of these factors are threatened with a resulting likelihood of increased malnutrition among these children in poorer families.

A significant proportion of children surveyed are fed twice or less in a day (27%), an indication of grossly inadequate feeding and these children were more likely to be malnourished than the more frequently fed ones. The current results however indicate that more children were being fed more frequently than during the previous survey in December 2001. The results further indicate that, almost all children surveyed (99%) were introduced to foods other than breast milk while less than six months of age. In developing countries, this factor is closely associated with increased malnutrition, increased incidence of

communicable diseases and death.

Under utilisation of vegetables, which are good sources of essential micronutrients also limits accessing essential nutrients for growth. Further giving tea to children is a common practice among residents in Belet Hawa and the tannin, contained in tea is a known inhibitor to micronutrient absorption thus reducing the bio-availability of nutrients like iron.

Women in Belet Hawa, avoid many nutritious foods during pregnancy frequently with the understanding that a larger child will be more difficult to deliver. In the absence of good quality obstetric services, this fear is well founded. Despite the evidence that underweight infants will have a reduced chance of normal development and a higher risk of death, it will probably be difficult to convince women to alter their diet until they have some confidence in the obstetric health services. Children born of severely anaemic mothers have low iron stores in their body at birth<sup>10</sup> and there is strong relationship between protein energy malnutrition and the micronutrient deficiencies (iron, Vitamin A).

## 5.4 Nutritional status

The survey results indicate a persistently high malnutrition in the district although it represents a dramatic improvement in the nutritional status of the population since the previous year's survey. The prevalence of total/global acute malnutrition<sup>11</sup> was 21.5% while severe acute malnutrition<sup>12</sup> was 2.2% compared to the December 2001 results of 37% and 8% respectively for total and severe acute malnutrition.

As depicted in the Figure 9 section 4.5, it is evident that the nutritional status of almost all children in this community shifted to the negative. The study population's variance is more or less the same as that of the reference population but with a shift to the left of the reference population with very few children above the reference median. The figure also shows that most children concentrated around the cut-off (W/H-2 z-score). The high-standardised prevalence reported also shows that at least half of the children have their nutritional status falling outside the reference data. This means that the majority of the district's population does not have normal nutritional status.

Both the percentage of the median and z-score categorisation of children confirm a serious/critical situation in the district (according to WHO guide on rapid nutritional assessment in emergencies, 1995), confirming the analysis of the food insecurity that has persisted in the last three years.

As in a number of previous studies, the data showed some overrepresentation of the older age group (48-59 months) with 230 children measured, still within the height criteria for inclusion in the survey. With accurate determination of age a common problem in situations where documentation is rare and literacy level is low, lack of statistically significant difference in the levels of malnutrition among the age groups (with exception of the 12 to 23 months old children), the over-representation of the older age group did not necessarily affect the survey results. The higher number in the older age category would however suggest that a number of children who qualified within the height criteria were in fact over the age of five years and most likely stunted in growth. This was confirmed by the high rate of stunted reported by the survey at over 36% (H/A <-2 z-scores), a confirmation of the chronic malnutrition in the region.

The high malnutrition amongst children aged 12 to 23 months, also seen in other surveys, can partly be explained by the fact that this is the age when most children are either introduced to weaning foods or to full family foods or stop breastfeeding. The weaning foods described are not only inadequate in quality but also in quantity. Cessation of breastfeeding also denies the child many nutrients.

There was no significant difference in nutritional status between the sexes, confirming findings of other studies in Somalia, which indicates that both boys and girls are treated equally when it comes to food

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10 Institute of medicine: 1998: Prevention of micronutrient deficiency: tools for policy makers and public health workers : National Academy Press, Washington. D.C. p.g 45

11 W/H <-2 z-scores and/or oedema

12 W/H<-3 Z scores and/or oedema



intake at household level (FSAU food utilisation study 2002).

Although the survey design does not permit statistical comparisons, it appears that the prevalence of malnutrition was higher in agro-pastoral households than others. This can partly be explained by the fact that food aid and health services are more readily accessible to urban and the riverine population than any other group, possibly due to their low mobility. Most of these agro-pastoral families had also lost most of their assets (both livestock and crop) during the protracted drought while as they stayed in the district unlike their pastoral counterparts. Most roads leading to agro-pastoral villages were also mined thus making accessibility especially for the GHC services restricted.

Results also indicate that agro-pastoral households tended to feed their children less frequently than children from other food economy groups. The fact that frequency of feeding was highly associated with nutritional status with children fed less frequently being more likely to be malnourished than those feeding frequently further explain the observed higher malnutrition among the agro-pastoral families. Findings also indicate that some families fed their children more frequently only at the expense of the adults' intake.

## **6 Conclusion and Recommendations**

The synergistic effect of the erratic food security, poor childcare and diseases tends to counter the mitigation efforts of humanitarian agencies. Therefore concerted humanitarian activities are still essential in the district.

Through consultations with the Belet Hawa community, partner International NGOs and Humanitarian Response Group of the Somali Aid Coordination Board (SACB) the need to focus on immediate and long term food security was underscored. However, the overriding issue still remains that of insecurity and the following are some key recommendations.

- Promote and support initiatives aimed at improving security in the district and in the region
- Continuation of relief food distribution as an important livelihood for the population in Belet Hawa
- Establish programmes aimed at improving water availability and accessibility
- Establish income generating programmes with potential to revive population's asset holding
- Support longer term interventions to improve food security
- Continuation of primary health care services, including immunisation
- Establish programmes aimed at improving and conserving the environment
- Intensify disease and nutrition surveillance in the district

## 7 APPENDICES

Population density for the districts in Gedo Region

District	Population estimates (WHO NID Oct 2002)	Estimated physical area (KM <sup>2</sup> )	Population density
Belet Hawa	66,481	3900	17
Luuq	76,779	8300	9
Dolow	39,050	1600	24
Garbaharey	76,120	8300	9
Elwak	52,150	7900	6
Bardera	76,770	15400	5
Bari Region (for comparison)	302,000	68,600	4

**TRADITIONAL CALENDAR FOR NUTRITION SURVEY IN BELET HAWA DISTRICT: Oct 2002**

Month	Events	1997	1998	1999	2000	2001	2002
Jan.	Beginning of Jiilal		57 -Soonfur -End of Elnino rains	45 Soonfur	33 Soonfur	21 Soonfur	9 Soonfur
Feb.	Mid of Jiilaal		56 Siditaal	44 Siditaal	32 -Siditaal -Reopening of Kenya/Somalia border	20 Siditaal	8 Siditaal
Mar.	End of Jiilaal		55 Arafo/Dul-Xaj	43 Arafo/Dul-Xaj	31 Arafo/Dul-Xaj	19 Arafo/Dul-Xaj -"Friday Fight"- Interclan fighting	7 Arafo/Dul-Xaj Interclan fighting
Apr.	Beginning of Gu'		54 Sako	42 -Sako -Killing of SNF leader-Dr. Ali Nuur	30 Sako	18 Sako	6 Sako
May	Mid of Gu'		53 -Safar -Ceel Addey Reconciliation meeting	41 Safar	29 Safar	17 Safar	5 Safar
Jun.	End of Gu'		52 Mawliid	40 Mawliid	28 Mawliid	16 Mawliid -Return of refugees from Mandera	4 -Mawliid -Intensified fight leading to fleeing
Jul.	Beginning of Xagaa		51 Malmadoone	39 Malmadoone	27 Malmadoone	15 Malmadoone	3 Malmadoone Refugee relocation & repatriation
Aug.	Mid of Xagaa		50 Jamadul-Awal	38 -Jamadul-Awal -Closure of Kenya/Somalia border	26 -Jamadul-Awal -Election of Abdi Kassim-TNG President	14 Jamadul-Awal	2 Jamdul-Awal
Sep.	End of Xagaa		49 Jamadul-Akhir	37 Jamadul-Akhir	25 Jamadul-Akhir	13 Jamadul-Akhir	1 Jamadul-Akhir
Oct.	Beginning of Deyr		48 Rajab	36 Rajab	24 Rajab	12 Rajab	
Nov.	Mid of Deyr	59 -Shacbaan -Start of Elnino rains	47 Shacbaan	35 Shacbaan	23 Shacbaan	11 Shacbaan	
Dec.	End of Deyr	58 Ramadan	46 Ramadan	34 Ramadan	22 Ramadan	10 Ramadan	

Jiilaal
GU'
Xagaa
Deyr

**Sampling frame used in Belet Hawa Nutrition Survey; Oct 2002**

Permanent Settlements	Temporary Settlement	Main Village	Pop estimate	Cum. popn	Cluster
BELET XAAWO	Section 1,10		2400	2400	1
BELET XAAWO	Section 3		2000	4400	2
BELET XAAWO	Section 6		2500	6900	3
BELET XAAWO	Section 9		2300	9200	4
BELET XAAWO	Section 2,5		2750	11950	5
BELET XAAWO	Section 4		2500	14450	6
BELET XAAWO	Section 11		2250	16700	7
BELET XAAWO	Section 7,14		2500	19200	8,9
BELET XAAWO	Section 8,14		2000	21200	
BELET XAAWO	Section 12		2000	23200	10
IDP		No	3000	26200	11,12
Banananey		No	300	26500	
Beled Amin		Yes	1500	28000	13
	Xanaley	No	200	28200	
Kamooraddoon		No	100	28300	
	Fullay	No	225	28525	
Bannaaney Biddo		No	400	28925	
warguduud		No	225	29150	
Warcaddey		No	200	29350	
	Ciidweyne	No	250	29600	
Bacaadweyn		No	200	29800	
	Qurac Jaban	No	125	29925	
	Qurac Bilaash	No	50	29975	
	Taaliko	No	75	30050	
Malkaaray		Yes	1750	31800	14
	Carabo	No	75	31875	
Gaawiido		Yes	1500	33375	15
	Allangoo	No	25	33400	
	Lebi Dhexweyn	No	100	33500	
	Karro Weyne	No	60	33560	
	Ubbo	Yes	175	33735	
Oda		No	1400	35135	16
	Kamaguure	No	100	35235	
	Dhurwaayaale	No	50	35285	
	Geeldidis	No	75	35360	
	Dudumo dheer	No	70	35430	
	Qansax ballaaran	No	200	35630	
	Hudley	No	40	35670	
	Wiyil	No	180	35850	
	Wecello	No	100	35950	
	Sariiro	No	75	36025	
	Dhusugle	No	90	36115	
	Quracdheera	No	150	36265	
	Qarbaboosh	No	120	36385	
Booco		No	600	36985	17

	Qooxle	No	50	37035	
	Cumarow	No	180	37215	
	Xaashi waal	No	300	37515	
	Jiicaqaaro	No	75	37590	
	Sheikh Barre	No	90	37680	
	zDambalaa	No	50	37730	
	Xaramka	No	400	38130	
	Tuuloqallooc	No	475	38605	
	Nuunuule	No	350	38955	18
	Kulanka	No	500	39455	
Malmalley		No	2250	41705	19
	Quracley	No	300	42005	
Laanabeer		Yes	425	42430	
	Jacjacley	No	80	42510	
	Wariiryaale	No	200	42710	
Jiracle		No	750	43460	20
Oodan		No	450	43910	
	Kashuumbo	No	100	44010	
Qansaxley		No	326	44336	
	Xaytaagan	No	75	44411	
DhuxunDhurwaa		No	100	44511	
	Dudumocad	No	100	44611	
Kamoorogoof		No	90	44701	
	Iraad	No	85	44786	
	Burcaano	No	100	44886	
	Bancillaan	No	60	44946	
Kanshiirrey		Yes	600	45546	
	Qoobfaras	No	50	45596	
	Bushkuleeto	No	340	45936	21
	zBurmooye	No	150	46086	
	Sallax cadaawe	No	60	46146	
Shirko		No	380	46526	
	Daqarrey/Farwaaley	No	370	46896	
	Gumar cad	No	50	46946	
	burjo Yaabis	No	150	47096	
	quraca guumayska	No	270	47360	
	Ceelqaraar	No	125	47491	
Lo'lays		No	400	47891	22
	Firoweyne	No	100	47991	
	Dagdheer	No	110	48101	
	Qaranri	No	300	48401	
	Dameerre	No	85	48486	
	Shabeel Duulaa	No	90	48576	
	Xaashaanle	No	175	48751	
Gubadhiyaa		No	750	49501	
	Booray	No	150	49651	
	Xaluushin	No	100	49751	
	Qodaxley	No	320	50071	23

	Burjaabo	No	140	50211	
	Magbilaash	No	160	50371	
	KQ/dhere	No	425	50796	
	Burcaday	No	90	50886	
	Dhiinle	No	50	50936	
	Kamoorwarabeye	No	180	51116	
	Xawaala tiirre	No	200	51316	
inaccessible	garasle	No	60	51376	
„	Ceeldhanaan	No	500	51876	
„	Siigaalow	No	150	52026	
„	caanocaani	No	175	52201	
„	Shabeel Duulaa	No	75	52276	??24
„	Harrey Hoolaa	No	125	52401	
„	Humbale	No	175	52576	
„	K/xagarta	No	75	52651	
„	Kaley	No	50	52701	
„	Cilanka(farraqa)	No	100	52801	
„	Haadfuulka	No	125	52926	
Carra Case		Yes	420	53346	24??
	Jannogaabo	No	175	53521	
	Weelxaraar	No	100	53621	
	Buul gorey	No	125	53746	
	Uleye	No	75	53821	
	Tulaa	No	50	53871	
	Dhammijjaale	No	100	53971	
inaccessible	Sarta	No	75	54046	
„	Lebi raarka	No	150	54196	
„	Kelligaras	No	75	54271	
„	Qurac gaajo	No	100	54371	
„	Gumar cad	No	65	54436	
Khadiija Xaaji		Yes	330	54766	25
	Wadijaabo	No	60	44826	
	Qurac dheere	No	300	55126	
	Toosida keynaan	No	100	55226	
	Meygaag	No	175	55401	
	Burayda	No	60	55461	
inaccessible (mined)	Mataa arbaa	No	175	55636	
	Libaaxyo	No	120	55756	
	Dhuxunka	No	125	55881	
	Dhabbo Murale	No	150	56031	
	Bilcille	No	150	56181	
	Cali Hooraa	No	210	56391	
	Qooxle	No	115	56506	
	Cagwalaf	No	290	56796	26
	Ciiraley	No	250	57046	
	Jabaa	No	125	57171	
	Boorre	No	85	57256	
	Goso weyne	No	200	57456	

	Huloobbo	No	175	57631	
	Labuu	No	100	57731	
	Ceeldheen	No	200	57931	
	Iskudhoon	No	190	58121	
	Aqallo aar	No	190	58311	
	Farah Jeelow	No	280	58591	
	Ibraahin Mursal	No	85	58676	
	carraweelo	No	85	58761	
	gubadle	No	200	58961	27
	Lebi Buulle	No	135	59096	
Hareeri hoosle		No	140	59236	
	Bacaadle	No	100	59336	
	Burkuus	No	55	59391	
	Gerigal	No	55	59446	
	Lebidhukaan	No	380	59826	
	Garabshabeel	No	125	59951	
	Bujobisle	No	80	60031	
	Haarta cad	No	100	60131	
	Burcambaar	No	195	60325	
	Harooda	No	360	60686	
	Hareerida cabdi Ducaale	No	260	60946	
	Garbagoof	No	180	61126	28
	Buniyo	No	265	61391	
	Gumar cad		270	61661	
Gaddoon dhowe		Yes	850	62511	
	Takhraar		160	62671	
	Bacaadka tooblow		100	62771	
	Qabri Sheikh Yaqu b	No	90	62861	
	Gumar cad	No	140	63001	
	Gebinuurre		185	63186	
	Qanjafulley	No	180	63366	29
	Dabac		150	63516	
	Sangali	No	40	63556	
Irridda		No	90	63646	
	Sabeeno gowrac	No	90	63736	
Baqtile		No	150	63886	
	Dhusandhusay		65	63951	
	Ceel macaan	No	280	64231	
	Cali iley		165	64396	
	Geel laqe	No	90	64486	
	Daawadiidaa	No	145	64631	
	Qalqalley	No	250	64881	
	Dabra Jiid	No	380	65261	
	Gawaanle	No	160	65421	
	Dhufaysyada	No	110	65531	
	Raamo gendi	No	185	65716	30
	Xaydibi	No	120	65836	
	Dagta Jiica	No	140	65976	

	Maddoo Cali	No	115	66091	
	Qool	No	155	66246	
	Mirofur	No	160	66406	
	Burtoosi	No	75	66481	
<b>56</b>	<b>164</b>	<b>9</b>	<b>66481</b>		

Cluster interval = 2216

Random number =1281

#### Stunting rates in Belet Hawa District (N=912)

	<b>Males</b>	<b>Females</b>	<b>Total</b>
<2 Z-scores	186 (38.2%) (CI: 29.5-47.7)	147 (34.6%) (CI: 25.6- 44.7)	333 (36.5%) 30.2-43.3
<-3 Z score	78 (16%) (CI: 9.9 -24.5)	57 (13.4%) (CI: 7.6-22.3)	135 (14.8%) (CI:10.4-20.6)
<80% of median	117 (24%) (CI: 16.9-32.9)	97 (22.8%) (CI: 15.4-32.3)	214 (23.5%) (CI: 18.2-29.7)
<70% of median	7 (1.4%) (CI: 0.6-3.4)	1 (0.2) (CI: 0-1.9)	8 (0.9) (CI: 0.4-20)



## **8 REFERENCES**

FSAU and partners: Belet Hawa Nutrition survey Report. December, 2001

FSAU, Sept 2002: Food Utilisation in Somalia

Institute of medicine: 1998: Prevention of micronutrient deficiency. Tools for policy makers and public health workers. National Academy Press, Washington, D.C. Pg. 45

WHO: 1995: Guide on rapid nutritional assessment in emergencies