

**SOOL PLATEAU OF  
SOOL & SANAG REGIONS**

**NUTRITION SURVEY  
June 2004**

**FSAU/MOHL/UNICEF/SRCS**



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## Abbreviations and acronyms

ARI	Acute Respiratory Infections
FAO	Food and Agriculture Organisation
FEG	Food Economy Group
FSAU	Food Security Assessment Unit
GAM	Global Acute Malnutrition
Ha	Hectares
H/A	Height for Age
IDP	Internally Displaced People
KM	Kilo Metres
MCH	Maternal and Child Health
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
UN	United Nations
UNICEF	United Nations Children's Fund
WFP	World Food Programme
W/H	Weight for Height
WHO	World Health Organisation

## Definitions

### **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.

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## EXECUTIVE SUMMARY

The Sool Plateau food economy zone (FEZ) stretches across Sool, Sanaag and Bari regions of Northern Somalia. The Sool Plateau of Sool and Sanaag regions host a population estimate of 69,550 (WHO population estimates, revised in June 2004 by survey team). Pastoralism is the main means of livelihood with shoats and camels being the dominant animal species. The plateau has experienced more than four years of drought that led to severe pasture depletion, cumulative degradation of rangeland with little potential for recovery and regeneration and water scarcity. All these culminated in significant livestock deaths including pack camels towards the end of the year 2003.

A nutrition survey and an inter-agency assessment were conducted in May/June 2003 and in October 2003 respectively. This led to commencement of various interventions in December 2003, during which nutritional screening of children was undertaken using weight for height, revealing high levels of malnutrition. Since December 2003 FSAU has undertaken three rounds of sentinel sites data collection in the Sool Plateau of Sool and Sanaag regions which has revealed a gradual improvement in the under fives nutritional status from around 19% to 15% of those screened. In contrast, the nutrition status for mothers was seen to deteriorate from 17% to 33%.

Between 29<sup>th</sup> May and 8<sup>th</sup> June 2004 a nutrition survey was conducted by FSAU, UNICEF, MOHL and SRCS to determine changes in nutritional status and establish the influencing factors since the last survey in May 2003. Using a two-stage (30x30) cluster sampling methodology, a total of 901 children aged 6-59 months and measuring 65-110 cm in height/ length were surveyed. The children came from 457 randomly selected households. A high proportion (about 32%) of the households was female headed while the rest were male headed. A total of 901 households were surveyed for mortality. Adults nutritional status, vitamin A deficiency and dietary diversity were also assessed. Qualitative data on care and feeding practices, food security and health related issues were collected through focus group discussions, key informant interviews or direct observations.

A high proportion (93.1%) of the children aged between 6 and 24 months were introduced to foods other than breast milk very early in life between 0-3 months. The results further indicate reduction on frequency of feeding of children. The proportion of children feeding few times per day between 1-2 times increased by more than half from about 17% in 2003 to 42%. At the same time the proportion of children feeding more than 4 times reduced, only about 7% of the children were feeding more than 4 times per day compared to 27% in 2003.

Child feeding practices were found to be sub-optimal among children aged 6-24 months. Among children of breast feeding age, the proportion still breastfeeding reduced from 61% in the previous survey to 31%. This can be attributed to the high demand of women's time, leaving children for long hours as they engage in casual employment and search for loans to buy food. Additionally, mothers were opting not to breastfeed their children due to lack of enough foods to feed themselves too as was noted in the focus group discussions.

The incidence of ARI, diarrhoea, malaria and measles in two weeks prior to the survey was 22.9%, 17.8%, 8% and 8% respectively. A high (70%) proportion of the children had received polio vaccine doses at least once or more times, 73% were immunised against measles while 57.8% had received vitamin A supplementation in the past six months prior to the survey.

Of the households that owned livestock three years prior to the survey, majority had lost significant proportions of livestock at the time of survey. About 19% had lost all their shoats while 68.1% had lost between 50% and 99% of their shoats. About 40% had lost all their camels while a half had lost between 50 and 99% of their camels. Both the survey and FSAU food security information indicate a shift in people's livelihood patterns recently. About a half of the surveyed households relied on self employment or petty trade as the main means of livelihood, about 37% on pastoral

while the rest depended on casual labour, relatives or external assistance. Qualitative information from focus group discussions, key informant interviews and food security information indicate that the household level coping mechanisms have been overstretched and people are resulting in extreme coping strategies for example significantly reducing the amount of food consumed and frequency of meals.

Unprotected wells and rain water from catchments or ponds were the main water sources for both drinking and cooking/personal hygiene. At the time of survey, 56.5% of the households had to cover more than five kilometres to access the nearest water point. Majority (75.3%) of the households used more than 15 litres of water in their households on a daily basis.

Survey results indicate a global acute malnutrition rate of 13.7 % (weight for height  $<-2$  Z score or oedema) compared to 12.5 % recorded in May 2003 survey. Severe acute malnutrition (weight for height  $<-2$  Z score or oedema) was 3.1% compared to 1.8 % in 2003 with oedema cases having increased from 5 to 12 cases. The malnutrition rates by sex were statistically significant with more girls (18.1%) being malnourished than boys ( $p<0.05$ ); a factor that will require further investigation. Malaria and dietary diversity had a statistically significant association ( $p<0.05$ ) with malnutrition.

The underfive mortality rate increased from 1.9 deaths/10000/day in 2003 to 2.89 deaths/10000/day. Crude mortality rate was 0.86 deaths/10000/day compared to 0.88 deaths/10000/day in 2003. A total of 11.2% of the mothers were malnourished (MUAC $<21$  cm).

The difference in the levels of global acute malnutrition in both surveys is not statistically significant although the rates remain higher than those seen in similar communities in the country. The increase in under five mortality rate to the alert level reveals a poor situation in the plateau. Malaria, dietary diversity, child sex, care practices and food insecurity contribute to the levels of malnutrition in the plateau. Overall, food insecurity had far reaching effects on the livelihood means of the dominantly pastoral population. Access to food in sufficient quantities or good quality was greatly compromised following significant losses of livestock or animals moving to distant locations. Care aspects have also been negatively affected as women have to spend long hours in search of casual employment or credit facilities.

The ongoing interventions from local communities, local and international NGOs have played a key role in preventing deterioration in the nutrition situation in the plateau. As was noted in the survey, following the interventions measles immunisation and vitamin A supplementation coverage had slightly improved. Inadequate Gu 2004 rains were received in the plateau while the next rains (Deyr 2004 rains) are expected in the next two to three months. However, even if good Deyr rains are received, it will take time for the population to recover. Following consultations with partners and sharing of the preliminary survey findings the enlisted recommendations were made:

- a. Continuation of targeted food distribution in the highly vulnerable areas of the plateau for next 2-3 months assuming proper 2004 Deyr rains.
- b. Continuation of supplementary feeding programme for pregnant/lactating mothers and children under five years in the plateau also in the next 2-3 months and treatment of the severely malnourished children assuming proper Deyr rains.
- c. Continued close monitoring the food security and nutrition situation in the area/intensification of surveillance activities.
- d. Intensify promotive and preventive health care interventions focusing on immunisation, hygiene, and control of water related diseases. Additionally, improve access to public health facilities.
- e. Promote nutrition education through the MCH/outposts focusing on breastfeeding, complementary feeding and frequency of feeding of infants and young children as well as feeding of sick children.
- f. Rehabilitate run-down boreholes, berkads and dams with an aim of ensuring water availability for both human and livestock in the long run.
- g. Promote alternative income generating activities through a credit programme to reduce over-reliance on livestock sources of livelihood.

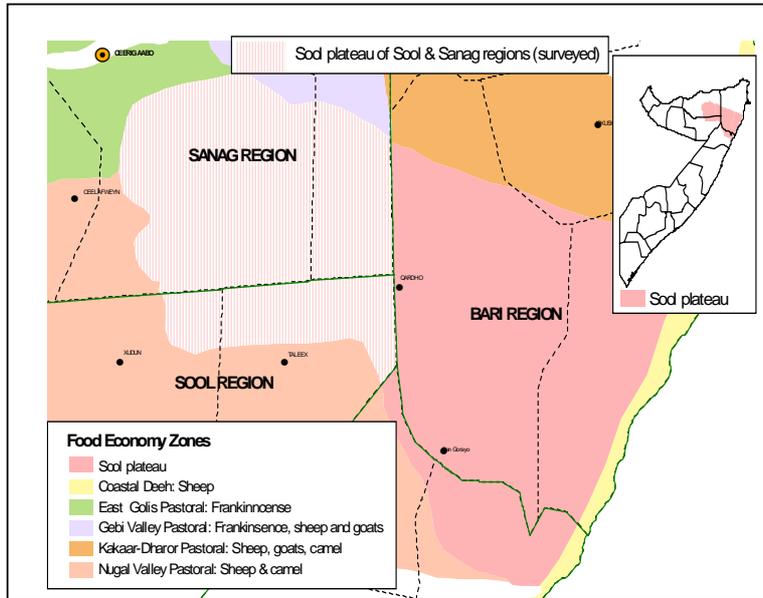
## SUMMARY OF FINDINGS

Table 1: Summary of survey findings

Indicator	2003		2004	
	No	%	No	%
Children under five years screened during the survey	895	99.4	901	100
Global acute malnutrition – W/ H <-2 Z score or presence of oedema	112	12.5 (CI 10.5-14.9)	123	13.7 (CI 11.5-16.1)
Severe acute malnutrition – W/ H <-3 Z score or presence of oedema	16	1.8 (CI 1.1-3.0)	28	3.1 (CI 2.1-4.5.)
Global acute malnutrition – W/ H <- 80% of median or presence of oedema	58	6.5	78	8.7
Severe acute malnutrition – W/ H <- 70% of median or presence of oedema	3	0.2	23	2.6
Oedema	5	0.5 (CI 0-0.9)	12	1.3 (0.7-2.3)
Proportion of children with diarrhoea in two weeks prior to survey	219	24.5	160	17.8
Proportion of children with ARI in two weeks prior to survey			206	22.9
Proportion of children with malaria in two weeks prior to survey	110	12.3	72	8.0
Proportion of children with measles in one month prior to survey	33	3.7	72	8.0
Proportion of children supplemented with Vitamin A in the last six months prior to the survey	427	26.0	521	57.8
Proportion of children immunised against measles (9-59 months)	217	26	857	73
Proportion of malnourished women (MUAC < 21 cm)			48	11.2
Under five mortality rate	1.9 deaths/10,000/day		2.89 deaths/10,000/day	
Crude mortality rate	0.88 deaths/10,000/day		0.86 deaths/10,000/day	

## 1 INTRODUCTION

The Sool Plateau food economy zone (FEZ) stretches across the Sool, Sanaag and Bari regions of Northern Somalia. The Sool Plateau of Sool and Sanaag regions forms the largest part of the plateau with a population estimate of 69,550 (WHO population estimates, revised in June 2004 by survey team). Pastoral livelihood is practiced with shoats and camels being the dominant animal species.



Shoats make up approximately 80% of the livestock population, camels around 15% and cattle are of minor importance at around 5% of the livestock. Cattle are owned only by the “middle” and “better-off” households.

The plateau has experienced more than four years of a chronic drought situation that led to severe pasture depletion, water scarcity, cumulative degradation of rangeland with little potential for recovery and regeneration. All these culminated in massive livestock deaths including pack camels towards the end of the year 2003. This negatively affected the migration options for poor and

middle pastoral groups. Overall, the pastoralists have lost large herds of livestock including pack camels. Nutrition and food security data from the area have persistently shown a poor situation in wellbeing of the population.

### 1.1 Survey Justification

A nutrition survey and an inter-agency assessment were conducted in May/June 2003<sup>1</sup> and in October 2003 respectively. This led to commencement of various interventions<sup>2</sup> in December 2003 within the Plateau. During these interventions, nutritional screening of children has been undertaken using weight for height, revealing high levels of malnutrition. Since December 2003 FSAU has undertaken three rounds of sentinel sites data collection in the Sool Plateau of Sool and Sanaag regions which has revealed a gradual improvement in the under fives nutritional status from around 19% to 15% of those screened. In contrast, the nutrition status for mothers was seen to deteriorate from 17% in December 2003 to 33% in April 2004. However, in view that these data (screening and sentinel sites data) are collected using different methodologies and in different locations, it is difficult to directly compare the various results. A clear understanding on the changes in nutritional status in Sool Plateau of Sanaag and Sool regions since the last nutrition survey lacks, hence the need for the current nutrition survey.

<sup>1</sup> Survey was undertaken by FSAU, UNICEF, SRCS and MOHL.

<sup>2</sup> Interventions consist of targeted food distribution, supplementary feeding of malnourished children, water trucking, mass treatment of livestock, free cash distribution, cash for work, treatment of common illnesses and immunization of children.

## **1.2 Survey Objectives**

1. To determine the levels of malnutrition in Sool Plateau of Sanaag and Sool regions through anthropometric measurements using weight for weight of children aged 6 - 59 months or 65 - 110 cm tall.
2. To describe factors influencing the nutrition status of children in Sool Plateau of Sanaag and Sool regions in relation to care practices, food security, health, water and sanitation situation.
3. To determine the coverage of measles vaccination and Vitamin A supplementation in Sool Plateau of Sanaag and Sool regions.
4. To determine the incidence of diarrhoea, measles and ARI two weeks prior to the survey.
5. To determine the extent of vitamin A deficiency in the survey area
6. To determine the levels of malnutrition among adult women using Mid Upper Arm Circumference.
7. To determine any changes in the nutritional status in Sool Plateau of Sanaag and Sool regions since the previous nutrition survey in May/June 2003.

## 2 BACKGROUND INFORMATION

### 2.1 General background

Sool plateau in an ecosystem mainly inhabited by pastoralists. The plateau covers three regions in northern Somalia: Sanaag, Sool and Bari Regions. The current nutrition survey was conducted in the same areas covered during the May/June 2003 nutrition survey i.e. in the part of Sool plateau covering Sanaag and Sool Regions. This is also the largest part of the plateau. The estimated population size of the survey area was about 69,550 (WHO population estimates, revised in June 2004 by survey team). The population of the plateau are mainly pastoralists most whom live the nomadic lifestyle and keeping camels, goats, sheep and cattle with insignificant agro-pastoral inhabitants. The surveyed part of the plateau has had recurrent political tensions being claimed by both the Somaliland and Puntland governments.

### 2.2 Food security overview

The Sool plateau is predominantly a pastoral community (accounting for 85-90% of the population) who keep camel, cattle, sheep and goats. The remaining 10-15% live in urban areas. The area used to be good grazing area and could sustain a high livestock population. Traditionally, the area was used only as a wet season grazing area, though with increased numbers of livestock over the last two decades, the area has been converted into an all year grazing area. This and the prevailing drought situation has resulted to severe degradation of rangeland.

Pastoralism is the main source of livelihood for the population of Sool plateau. The sales of livestock and livestock products (milk, ghee and skins) provide the main income sources, out of which households purchase food and non- food items. In a normal year, the sales of livestock and livestock products contribute 60-70% of the poor household's income in a year. The rest of the income comes from self employment activities such as collection and sale of bush products, employment and gifts. The plateau has had four successive years of poor rains since 2000 resulting in severe pasture depletion and water scarcity, high livestock deaths that has seriously affected people's livelihood. Consequently, people have resorted to distress means of living. Over the years, the economic situation of the plateau has exacerbated by huge expenditure burden incurred by costly water trucking schemes for both human and livestock consumption. The cumulative impact of all these negative indicators caused the pastoral livelihood to collapse. Destitution is on the rise within the plateau. The community is now highly dependant on both formal and informal support for survival. This includes clan or kin based donations in kind or cash, food distribution by religious groups and interventions from the humanitarian community.

The main water sources within the plateau include berkads, water catchments (balleys, open wells and ponds) mainly following a wet season and boreholes. Most of the boreholes yield hard water limiting its use especially for domestic purposes. Berkads are highly prone to microbial contamination owing to the mode of water harvesting as well as handling of the same during collection for consumption purposes. The table below summarises key events that have affected food security in the plateau.

*Table 2: Chronology of events affecting food security in the Sool plateau of Sool and Sanaag 2001 - 2004*

Period	Event
Dec,2001	Below normal Deyr rains. Large number of livestock migrated to Nugal valley, difficult to sell livestock due to poor body condition, poor prices in local and export markets.
Jan – March 2002	Worsening situation. Berkads and Balleys dry and water prices go up. Camels migrate to the Hawd area south of Sool region some of the

	family members remain with the small livestock. Terms of trade for pastoral households worsen. 20-30% mortality rate of shoats. Poor households
April – June 2002	Poor Gu rains sporadic and poor distribution with strong Hagay winds causing early drying up of pasture and water sources. High mortality and abortions.
Jul- Aug 2002	Majority of poor households becoming increasingly vulnerable to the high costs of commodities. Changes in consumption patterns, By August water prices go up putting more strain on the already weakened purchasing power. Milk production has fallen to 50% of the baseline. By August 25,000 people estimated to be food insecure.
Sept- Dec 2002	Sool plateau of eastern Sanaag received significant Deyr rains in the first week improving water and pasture availability, though livestock production is far below normal. Pasture improvement though parts of the plateau that cover Huddun and Taleh Districts continue to be of concern. By November Berkads replenished but pasture regeneration not adequate. Extensive out migration of camel herds and 20-30 % from the rain deficit areas to upper Nugal valley and the Hawd where the rains were good. By December the pastoralists were still experiencing the cumulative effects of several consecutive poor rainy seasons.
Jan- March 2003	Reduced camel calving rate due to the effect of drought. Milk prices higher than normal by 30% due to low milk production. Terms of trade favourable due to increased demand at both local and export market but livestock still in poor body condition. Widespread depletion of natural resources. Water points pressured by the high concentration of livestock. Abnormal migration of livestock mainly in Eastern Sanaag. A drum of water costing \$2 compared to \$1.50 during the same period in 2002. Main expenditure for families water and food. The poor pastoralists and the lower strata of the middle wealth group have limited access to daily food intakes. Cash and assets drawn down on the cost of the high water prices. Persistent drought of three years has decreased the number of animals in their herds and lessened the ability to cope with the long dry spell. Meanwhile the middle and the better off wealth groups were able to transport their livestock and households to where they could find water.
April – June 2003	Parts of Sool plateau received heavy rains in April. Some rains received in May but the cumulative number of rainy days was below normal. Poor and middle pastoralists who did not move out of the plateau were finding it increasingly difficult to obtain sufficient cash to buy food having lost up to 60% of their income. With virtually no income from milk sales which used to provide approximately 40% of household's income and the rest coming from livestock sales and now has reduced by 50%. By June 3,500 households facing 25-35 % of their energy requirements.
July- Sept 2003	Food security situation reached an alarming stage. The pastoralist lost their assets and many in the middle wealth group slipping to the poor or very poor wealth groups and a danger of others becoming destitute. High water prices continue, sale of breeding animals, normal coping strategies almost being exhausted. Reduction of number of meals from three to one per day. Poor and middle wealth groups sold their breeding and pack animals. Drastic cut in asset holdings among all wealth groups, 80 % of the camels and more than 50% of the shoats on the plateau have been sold, moved out or died. As a result of complete failure of Gu rains water trucking continued. Terms of Trade were still favourable but the number of animals in good marketable condition was minimal. Animals that had moved out of the plateau were in good body condition and those that remained behind were of below normal body condition.

Oct-2003	Multi-agency assessment revealed that cumulative losses (mortalities and distress sales) over the past years greatly reduced herds and altered herd composition. Camel losses were 60-70 % with even higher losses of pack animals of over 80% and shoats 40-50%. Drop in reproduction rates thus 60-70 % drop in income from livestock sales thus drastically reducing the purchasing power. Terms of trade poor, in a normal year one shoat is exchanged for a 50kg bag of rice but had now changed to 2 - 3 shoats per 50kg bag of rice.
Dec 2003	Some showers of rain received in the western border of Sool plateau towards the upper Nugal valley. Prior to these rains the pastoralists of Sool plateau of Sanaag had made the longest ever out migration to Sool plateau of Bari and coastal grazing area, while the others moved towards the Sool plateau of Sool region. The huge migration exceeded the rangeland carrying capacity and limited the possibility of pasture regeneration. Emergency interventions by the humanitarian community commenced in the plateau.
Jan –March 2004	The area still remains under emergency situation.
April – 2004	Some rains in Taleh and Sarmanyoo villages from third week of march. These attracted livestock from the Sool of Sanaag. Sool plateau remain in a state of humanitarian emergency.

## 2.3 Humanitarian operations in Sool plateau

### 2.3.1 Development Activities

International agencies operating in the region include CEFA and CINS that are involved in agriculture, fisheries, rehabilitation of social services etc. CARE international and COOPI are also based in Erigavo and are involved in emergency humanitarian interventions. Horn relief is involved in pastoral issues, ILO in rehabilitation of basic infrastructure and NPA in both water sources rehabilitation and health issues. SRCS is also providing health services. Local NGOs like Havoyoco undertake water point's rehabilitation. UNICEF, MOHL, WHO and WFP are also involved in humanitarian interventions in the plateau.

Following the May/June 2003 nutrition survey and Interagency assessment in October 2003, several humanitarian interventions have been implemented in the Sool Plateau since November 2003. Table 3 below provides a summary of these humanitarian responses and agencies involved.

*Table 3: Summary of humanitarian interventions in the Sool Plateau of Sool and Sanaag Regions including other parts of the regions.*

<b>Intervention</b>	<b>Agency</b>
Free food distribution	WFP, PENHA, Islamic religious groups, Diaspora community and Business communities in Hargeisa and Burao
Health related interventions	UNICEF, MOHL, WHO
Water and sanitation related interventions	NPA, UNICEF, COOPI and Horn Relief
Livestock interventions	COOPI, Candlelight
Cash related interventions	UN-OCHA, Horn Relief, NPA and CARE

### Free Food distribution

WFP has undertaken three rounds of free food distribution in Sool and Sanaag Regions targeting families of malnourished children identified through the screening process, as well as destitute families in settled communities in Eastern Sanaag. Each targeted family receives 50kg of maize,

5kg pulses and 2.3kg of oil during each round of distribution. About 1496 MT of food have been distributed with much of it going to locations within the plateau. In the first round undertaken in December 2003, 388 MT of food benefited 6846 households. In the second (February 2004) and third (April 2004) rounds, 475 MT and 632 MT were distributed respectively.

In April, 2004 PENHA, a local NGO undertook free food distribution in 29 locations in Sanaag region hence covering parts of the plateau. A total of 107.1 MT of food consisting of rice, sugar and vegetable oil were distributed. Islamic religious groups, Somalis in Diaspora Hargeisa and Burao business communities had also contributed foods for the population in the plateau. Between December 2003 and January 2004, Candlelight (a local NGO relocated about 180 families in Sool Plateau and Lower Nugal plus their livestock, to areas that had received some rains in addition to providing each of these families with some food consisting of rice, wheat flour, sugar and vegetable oil.

### **Health related interventions**

UNICEF in collaboration with MOHL and WHO have undertaken three rounds of health related interventions in the plateau which included provision of vitamin A and iron/folic acid supplementation to children and pregnant women respectively, provision of antenatal care services, provision of supplementary food to all malnourished children identified during the screening process, immunisation of under five children against the immunisable childhood diseases, treatment of common illnesses on an out patient basis and provision of health and nutrition education on child feeding and environmental hygiene.

During the first round, 62 villages in the Plateau were covered. A total of 6,890 under-five year old children were screened, 18.9% based on <80% median or oedema were malnourished. In the second round, 7035 were screened with 16.3% being malnourished while in the third round 7144 under fives were screened and 21% were malnourished. All malnourished children received supplementary food in addition to their households receiving food from WFP. At the time of survey, the fourth round of interventions was underway.

### **Water and sanitation related interventions**

Through its pastoralist livelihood emergency programme, COOPI is rehabilitating wells mainly in the western side of the plateau. The majority of the water facilities have been either non-functional or functioning at low capacity. An assessment carried out by COOPI showed that availability of water was the basis for establishment of the various settlements. Key problems related to water and sanitation identified were user practices that lead to water contamination and lack of infrastructure for watering the livestock. Within the plateau COOPI has plans to access water to about 5000 households by rehabilitating existing water sources. The project is also creating awareness on the link between water contamination and water related diseases.

Between November 2003 and March 2004, Horn Relief in partnership with UNICEF rehabilitated thirty three wells in Eastern Sanaag targeting 15,000 direct beneficiaries. In January 2004 both agencies also distributed 600 jerry cans and 7 bladder tanks to 600 highly vulnerable pastoralists in Xingalool; Baragaha Qol; Shimbiralle and Ballibusle in Sanaag Region. Additionally, for 13 days in November 2003, Horn Relief with funding from CARE implemented the '*Subsidizing of Fuel for Water Trucking in Eastern Sanaag*' project through which 14 litres of water per day was distributed to several vulnerable pastoral households and their livestock. Subsequently, from March to May 2004, Horn Relief in partnership with VSF Suisse subsidized fuel for water truckers in 10 water collection points in villages in Eastern Sanaag Region. NPA was also involved in rehabilitation of water facilities (shallow wells and boreholes) and water trucking. PENHA contributed to water provision through water trucking in Habarshiro and Balibusle.

**Livestock related interventions**

Since March 2004, COOPI has been implementing a Pastoralists Livelihood Emergency Assistance programme that aims at reducing diseases or parasites among the livestock that have survived the drought. The interventions include deworming, tick control and mass treatment of livestock. The interventions are implemented in areas with high concentration of livestock. At the time of the survey these activities had been implemented in Awbogays and Garadag in Sanaag and similar work had just started in Lasanood (Kalabadh, Yagoori and Sukiria). The programme targets to treat 350,000 livestock and at the time of the survey a total of 80,000 had been treated for 2,000 families. Notable though, is that of the locations covered at the time of survey, only Awbogays is within the Sool Plateau of Sool and Sanaag Regions.

**Cash related interventions**

Between December 2003 and February 2004, Horn Relief with funding from NOVIB and in partnership with NPA and UN-OCHA, carried out the free cash distribution. A total of US \$50 cash grants were distributed to 13,830 vulnerable households in the Gebi Valley and Sool Plateau of Sool and Sanaag regions covering Badhan, Dhahar, Erigavo, Taleex and Hudun Districts. CARE has also undertaken cash for work activities.

**2.3.2 Health**

The Ministry of Health and Labour, Somaliland with support from UNICEF has continued to support healthcare provision in the area. Currently there are two operational MCHs (Ceel Afwein and Dhahar) and 11 health posts. There are however plans by ministry of health and labour and UNICEF to upgrade Xingalool health post to an MCH. Awrbogays and Darawayne have also been recommended to be upgraded. The MCHs are managed by auxiliary nurses who have been trained on the job while the health posts are managed by community health workers who operate a basic kit for treatment of minor ailments. Traditional birth attendants provide antenatal and post natal care. Although not located within the plateau, Erigavo MCH supported by SRCS also benefits populations from the plateau.

The Minimum Essential health Service Package offered in MCH/OPDs includes antenatal care and postnatal services, under five clinics, OPD clinics, immunization services and preventive and promotive services. The health posts offer treatment of small ailments.

**2.3.3 Morbidity**

Malaria, diarrhoea, respiratory tract infections and anaemia are among the common diseases reported in the livelihood zone.

**2.4 Water and environmental sanitation**

There is extensive contamination of surface supplies and dug wells. Most have no proper fencing and covers hence are liable to extensive contamination. This is due to unhygienic drawing of water, lack of treatment processes for drinking water and poor understanding of the health risks associated with contaminated water. Additionally, most households have no latrines with open defecation being the only means of disposal for human waste.

## 2.5 Previous nutrition information in Sool Plateau – 2002 to date

Nutrition data in the Sool Plateau indicates a poor nutritional status. With reference to sentinel sites surveillance data, the nutritional status of children has improved while that of mothers seems to have deteriorated from 17% malnourished in November/December 2003 to 33% in April 2004. Table 4 presents a summary of the nutrition information among underfives. For more details on the areas covered by each of the presented data, see appendix 6.

*Table 4: Summary of the nutrition information among underfives in the Sool plateau of Sool and Sanaag Regions*

Date	Data type	Agency	< -2z- score or oedema	<-3z- score or oedema	<80% of median or oedema	<70% of median or oedema	MUAC <12 .5 cm or oedema.	<11cm or oedema .
July 2002	Rapid assessment	FSAU			6.3	0.4		
May/June 2003	Nutrition survey	FSAU/UNICEF/MOHL/ SRCS	12.5%	1.8%				
July 2003	Health facilities	MOHL			15%			
October 2003	Interagency assessment	UNICEF/FSAU/WFP/O CHA/Horn Relief/NPA					6%	
November 2003	Rapid assessment	FSAU/MOHL/Horn Relief	13.7%	3.5%				
November/D ecember 2003	1 <sup>st</sup> round of sentinel sites surveillance	FSAU	18.9%	3.8%				
December 2003	1 <sup>st</sup> Round of interventions screening	UNICEF/WHO/MOHL			18.9%			
December 2003	Rapid assessment	UNICEF/FSAU/WHO					27%	5.8%
January 2004	2 <sup>nd</sup> round of sentinel sites surveillance	FSAU	21%	5.7%				
February 2004	2 <sup>nd</sup> round interventions screening	UNICEF/WHO/MOHL			23.8%	2.1%		
March 2004	3 <sup>rd</sup> round interventions screening	UNICEF/WHO/MOHL			21%	1.1%		
April 2004	3 <sup>rd</sup> round of sentinel sites surveillance	FSAU	15%	1.9%				

## **3 METHODOLOGY**

### **3.1 Survey Design**

The study was both descriptive and analytical in nature. Cross-sectional data was collected through a standard household questionnaire for nutrition (see appendix 2) Retrospective mortality data for the past 90 days prior to the survey was also collected among the study households (see appendix 4). Qualitative data was collected by survey supervisors and coordinators through focus group discussions and key informant interviews to provide further understanding of the underlying causes of malnutrition.

### **3.2 The sampling procedure**

Using a two-stage cluster sampling methodology, 30 clusters were randomly selected based on population proportional basis from Sool plateau of Sool and Sanaag Regions. Initially a sampling frame was constructed from which a representative sample could be drawn. A list of all villages within the Plateau, with their respective populations was used to construct cumulative population figures for the plateau. At the time of the survey, pastoralists were in the process of migrating into areas where rains had been received within the plateau or outskirts of the Plateau. With help of the survey team who comprised people from within the plateau or had recently travelled in the area, all these locations were included in the sampling frame hence giving these pastoralists an equal chance of being sampled for the survey. The population estimate figures were initially received from WHO and further verified for authenticity by the survey team. An estimated population of 69,550 was used from which a cluster interval of 2,318 was calculated. Using currency numbers on a bunch of Somali notes a random number, 2308 was chosen within the cluster interval to determine the first cluster. The subsequent clusters were determined systematically by adding the cluster interval (2,318) to the first randomly selected number (see appendix 1). Due to insecurity in one of the randomly selected cluster/village, replacement was done with the nearest accessible village inhabited by population with similar basic characteristics with the selected village. From the 30 randomly selected clusters, a total of 913 children between the heights/length of 65 and 110cm and 6-59 months old were randomly surveyed. However, insufficient information on some children and extreme measurements led to the dropping off of 12 children at analysis. Thus only 901 were included in the analysis of child data.

In each of the clusters, mortality questionnaires were exercised to 30 households. Same sampling frame was used in cluster selection hence the same clusters selected for the nutrition data were also used for the mortality data. In total, mortality data was collected from 905 households irrespective of whether with an under-five or not (see section 3.2.1 for details of household selection).

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

The study population consisted of people living in the Sool Plateau 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 relative or neighbour's house, the child could be called and assessed.

With reference to mortality, the data was collected retrospectively with the first questionnaire being exercised on the first randomly selected household irrespective of presence of an under-five child or not. Same direction (which has been randomly picked by spinning a pen) as indicated above was followed but unlike the survey for children where only households with children were visited for interview, the mortality questionnaire was exercised in every household in the identified direction. The survey team turned to the right side on reaching the cluster edge, until 30 households were surveyed from the cluster.

### **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.

### 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

A proxy indication of mortality was taken retrospectively to provide some idea on the health situation of the population. The mortality assessment was done concurrently with nutrition survey in which a 30 by 30 cluster sampling methodology was used. The survey methodology used for the nutrition survey was adopted with the exception that households were selected as the second sampling unit. The selection of clusters and households were the same as for nutrition survey. At least 30 households were randomly selected in each cluster and the mortality questionnaire administered to a responsible member of that household. **All households within the selected cluster were eligible for inclusion** in the mortality survey, whether there was under-five or not. Households were systematically surveyed until the 30<sup>th</sup> household. Each household surveyed was asked the composition of their members in two parts; - those members less than 5 years and the total number of household members. The household was then asked how many if any of the household members had died in the last three months. The mortality questionnaire is appended in the report. A total of 905 households with and with no under-five child at the time of the survey were included in the survey.

The overall mortality was calculated by taking the total number of deaths multiplied by a factor (10,000). This was divided by the population of the surveyed households using the formulae below:

$$MR = n / \{[(n+N) + N] / 2\}$$

Where n = total number of persons reported dead in the households surveyed

N = total number of people living in those households at the time of survey

The mortality was calculated retrospectively for the past **3 months**, the recall period. Mortality rates per 10,000 persons per day were obtained by dividing the figure above by 93 days that was used as the recall period. Calculation of under-five mortality rates was done using the same formulae but with a denominator of under-five children in the surveyed households.

In case a member had died, the household was asked to explain the signs and symptoms of the person before he/she died.

Mortality rates can be interpreted according to the following reference

- For under-five years old children
  - Under-five mortality rates  $\geq 2$  deaths/10,000/day indicate a situation of alert
  - Under five mortality rate  $\geq 4$  deaths/10,000 children/day indicate an emergency
- For the total population
  - Mortality rates  $\geq 1$  deaths/10,000 persons/day indicate an alert situation
  - Mortality rates  $\geq 2$  deaths/10,000 persons/day indicate an emergency.

### **3.3.6 Dietary Diversity**

Dietary diversity was determined by taking a simple count of various food groups consumed in a given household over the past twenty four hours. Additionally, the frequency that given members of the household (less than five or over five year olds) consumed certain food groups was also determined. The food groups considered were Cereals/staples; Beans and other pulses; Dairy and dairy products (milk); Fats/oil/Ghee; Sugars in tea and others; Meat and meat products; Eggs; Fish and sea food; Roots and tubers; Fruits; Vegetables and Beverages, spices & other products

### **3.3.7 Adult Nutritional Status**

Adult nutritional status was determined among mothers in households surveyed by use Mid Upper Arm Circumference (MUAC). The overall nutritional status was defined as: mothers with MUAC less than 21 cm as being malnourished while those with a MUAC equal or greater than 21 cm were of normal nutritional status

### **3.3.8 Vitamin A Deficiency**

Vitamin A deficiency (VAD) can be assessed via clinical assessments namely night blindness, bitots spots, corneal xerosis and corneal ulceration; biochemical or dietary assessments. During the survey, VAD was assessed if any members of a household suffered from night blindness.

### **3.3.9 Consumption Coping Strategies**

Consumption coping strategy was determined and calculated as per The Coping Strategies Index Field methods manual by CARE and WFP. Respondents were asked to identify how many times a given coping strategy had been in the past 30 days prior to survey.

### 3.4 Description of survey activities

*Table 5: Chronology of activities for the Sool plateau nutrition survey*

<b>Major Activity</b>	<b>Dates. 2004</b>
Preparation of tools, methodology & review of secondary data (Nairobi)	17 <sup>th</sup> – 25 <sup>th</sup> May
Training of enumerators and pre-testing (Erigavo, Sanaag)	29 <sup>th</sup> – 31 <sup>st</sup> May
Cluster Identification	2 <sup>nd</sup> June
Collection of data	3 <sup>rd</sup> – 8 <sup>th</sup> June
Entry of data	9 <sup>th</sup> – 11 <sup>th</sup> June
Preliminary analysis	7 <sup>th</sup> – 9 <sup>th</sup> July
Presentation of preliminary results	21 <sup>st</sup> July
Report writing	12 <sup>th</sup> – 31 <sup>st</sup> July
Circulation of report	31 <sup>st</sup> July

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 partners namely; MOHL, SRCS, and FSAU. Overall support, supervision and co-ordination was done by two FSAU nutritionists, one UNICEF nutrition officer and 1 MOHL national PHC coordinator. MOHL staff and FSAU nutrition monitor in the region assisted in the identification of the qualified enumerators who were selected on the basis of their experience with previous nutrition surveys and UNICEF multi-indicator cluster surveys.

### 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, verification of deaths within households, 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 a village in the outskirts of Hargeisa town (training of survey team was undertaken in Hargeisa). Standardisation involved taking repeated measurement of 10 children from an MCH 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 team led by two nutritionists, UNICEF nutrition officer and national MOHL PHC coordinator, (ii) crosschecking of filled questionnaires on daily basis and (iii) daily review undertaken with the 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). Analysis of certain variables e.g. total food groups consumed and the total losses in livestock ownership was undertaken in Microsoft Excel.

### **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 weight 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 Household characteristics of study population

The nutrition survey covered a total of 457 households with a mean household size of 7.38 SD= 2.88 persons. Male headed households comprised 67.6% while the rest are female-headed households (32.4%). The mean number of the under fives per household was 1.9 per household.

Table 6: Household characteristics

	N	(%)
Sex – Household head (n=457):		
Male	309	67.6
Female	148	32.4
<i>Household size:</i>	7.38 SD = 2.88	
<i>Household residence status (n=457)</i>		
Those in their usual residential areas	327	71.6
Internally displaced persons/Internal migrants	112	24.5
Returnees	18	3.9
<i>Place of origin (n=130):</i>		
Within the Sool plateau livelihood zone	67	51.5
Other parts of Sool and Sanaag regions not in the Plateau	61	47
Ethiopia	2	1.5
<i>Date of arrival (n=130)</i>		
<=3 months	56	43.1
4 – 20 months	74	56.9
<i>Reason for movement (n=130):</i>		
Pasture/food/water shortage combined	64	49.2
Pasture shortage only	36	27.7
Loss of all livestock	8	6.2
Others (insecurity in areas of origin, divorce and job search)	22	16.9

Majority (71.6%) of the surveyed households were residents, 24.5% internally displaced persons (from within and outside the plateau) and about 4% were returnees. Of the non residents, 51.5% had originated from within the livelihood zone, 47% from others parts of Sool and Sanaag regions not within the Sool plateau livelihood zone and only 1.5% came from Ethiopia. Overall more than half (56.9%) of the non residents had arrived into the Plateau 4 or more months prior to the survey. The main reason for movement was a combination of pasture, water and/or food shortage (reported by 49.2% of the households). Pasture shortage alone influenced the movement of 27.7% households while loss of all livestock caused the movement of 6.2% of the households. About 17% of the households moved due to insecurity in areas of origin, divorce or in search of

employment opportunities.

### 4.2 Livelihood, Assets Ownership and Coping Strategies

Most of the households relied on self employment or petty trade as a means of livelihood (50%), 36.7% pastoral, 8.7% casual labour, 3.9% depend on relatives for assistance while the rest lacked a definite means of livelihood or relied on external assistance for example food aid. Within the Sool Plateau livelihood zone pastoralism would normally be the main means of livelihood but with the chronic drought situation, the pastoralists have lost most of

their livestock while the remaining livestock have poor body condition hence fetching poor market prices.

*Table 7: Distribution of households by means of livelihood, Assets Ownership and consumption coping strategies*

<b>Livelihood means (N=457)</b>	<b>N</b>	<b>%</b>
Self employment/Petty trade	229	50.1
Pastoral	168	36.7
Casual labour	40	8.7
Depend on relatives	14	3.9
No specific livelihood or rely on external assistance .e.g. Food aid	7	1.5
<b>Assets Ownership</b>		
<i>Change in shoats owned in past 3 years (N = 276)</i>		
Gained shoats	9	3.2
Lost <50%	27	9.8
Lost between 50% to 99%	188	68.1
Lost all shoats (100%)	52	18.8
<i>Change in camels owned in past 3 years (N = 206)</i>		
Gained camels	5	2.4
Lost <50%	15	7.3
Lost between 50% to 99%	104	50.5
Lost all camels (100%)	82	39.8
<b>Consumption coping strategies (N=457)</b>		
- Switch from high quality to low quality less expensive foods	231	50.5
- Borrow food or rely on help from relatives	274	60
- Purchase food on credit	264	57.8
- Gather wild food or hunt	54	11.8
- Sell livestock at give-away price to buy staples?	194	42.5
- Send household members to eat elsewhere?	146	32
- Limit portion size at mealtimes	293	64.1
- Restrict consumption of adults in order for small children to eat	267	58.4
- Ration the money you had and buy prepared food	180	39.4
- Reduce number of meals eaten in a day	293	64.1
- Skip entire days without eating	194	42.5
- Deplete assets to get food, i.e. sell livestock, land, jewellery, etc)	69	15.1

Of the 276 households that owned shoats in the past three years to the survey, about 68% had lost between 50% and 99% of the shoats while about 19% had lost all the shoats. Only 3.2% had their shoats increase over the same period. Similarly, of the 206 households that owned camels three months prior to the survey, about a half had lost between 50% and 99% of the camels while about 40% had lost all their camels at the time of survey. Only 2.4% of the households had their camels increase over the same period.

All surveyed households

reported to have employed at least one or more of the consumption coping strategies. Borrowing of food from relatives, reliance on credit and switching from high quality to low quality foods are some of the coping strategies employed by more than half the households in Sool plateau of Sool and Sanaag Regions.

### **4.3 Water access, sanitation and hygiene**

As shown on table 8 below, at the time of survey, majority of the households were relying on water from unprotected well/spring (about 59%), while about 32% were depending on rain water from catchments for their drinking or cooking and personal hygiene. Collectively, about 8% and 9% were obtaining water from boreholes, berkads, and public taps for drinking and cooking /personal hygiene respectively.

Table 8: Water access, sanitation and health seeking behaviour

<b>Water access</b>	<i>N</i>	<i>(%)</i>
<i>Main source of drinking water (n=457):</i>		
Boreholes	29	6.3
Berkads	6	1.3
Rain water from catchments or ponds	148	32.4
Unprotected well/spring	272	59.5
Public tap	2	0.4
<i>Main source of cooking water and personal hygiene (n=457):</i>		
Boreholes	10	2.2
Berkads	147	32.2
Rain water from catchments or ponds	268	58.6
Unprotected well/spring	2	0.4
Public tap		
<i>Distance to the nearest water point: (n=457)</i>		
0 – 500 metres	49	10.7
501 – 1000 metres	73	16
1001 – 5000 metres	77	16.8
>5000 metres	258	56.5
<i>Amount of water used in the household per day</i>		
<i>More than 15 litres</i>	344	75.3
<i>11-15 litres</i>	58	12.7
<i>6-10 litres</i>	36	7.9
<i>less than 6 litres</i>	19	4.2
<b>Sanitation and hygiene</b>		
<i>Sanitation facility (n=457):</i>		
Improved/ventilated pit latrine	15	3.3
Traditional pit latrine	44	9.6
Bush/open grounds	398	87.1
<i>Wash hands after defecation (n=457)</i>		
Always		
Often	234	51.2
Sometimes	113	24.7
Hardly rarely	45	9.8
	65	14.3
<i>Wash hands before eating or food preparation: (n=457)</i>		
Always	234	51.2
Often	113	24.7
Sometimes	45	9.8
Hardly rarely	65	14.3

About 57% of the households were travelling over five kilometres in search of water. Most of the households in the survey area use more than 15 litres of water daily.

Latrine use in the survey area is quite low. Collectively about 12.9% of the population reported using improved pit latrines or traditional pit latrines. Majority (87%) disposed faecal waste on the open ground/ in the bush. Personal and food hygiene was also low, almost half 48.7% were not always washing their hands before eating or during food preparation.

#### 4.4 Health seeking behaviour

Table 9: Health seeking behaviour

	N	%
<i>Seek healthcare assistance when a member is sick (n=457):</i>		
Yes	352	77
No	105	23
<i>Reason (n=105)</i>		
No health facility in near distance	69	65.7
No money	36	34.3
<i>Where (n=352):</i>		
Traditional healer	105	29.8
Private clinic/pharmacy	227	64.5
Public health facility	20	5.7

Majority (77%) of the households were seeking healthcare assistance when sick. They were consulting mainly private/pharmacy with almost a third consulting traditional healer and a very low proportion (5.7%)

consulting public health facility. Of those not seeking health care when member of household was sick, about 66% and 34% reported that it was due to lack of health facility and money respectively.

#### 4.5 Formal and informal support

Table 10: Formal and informal support

	N	%
<i>Informal support (N = 457)</i>		
Loans	68	14.9
Gifts	21	4.6
Remittances from abroad	19	4.2
Zakat from better off households	11	2.4
Remittances from within Somali	2	0.4
<i>Formal support (N = 457)</i>		
Free food	172	37.6
Free cash	62	13.6
Supplementary food	47	10.3
Water subsidy	40	8.8
Cash for work	18	3.9
Food for work	14	3.1
Transportation of animals subsidy	3	0.7
Veterinary care	2	0.4

Social support networks within Somalia are a major source of support in Somalia. At the time of survey about a quarter (24.1%) of the households had received some form of social support, three months prior to the survey. Loans were the main form of informal support received.

Overall, a half (50.5%) of the households had received some form of formal support with free food distribution being the main support, reported by 37.6% of the households.

#### 4.6 Characteristics of study children

Table 11: Distribution of children according to age and sex

	Boys		Girls		Total	
	N	%	n	%	N	%
6-11 months	41	47.7	45	52.3	86	9.5
12-23 months	77	47.8	84	52.2	161	17.9
24-35 months	99	50.5	97	49.5	196	21.8
36-47 months	109	49.1	113	50.9	222	24.6
48-59 months	112	47.5	124	52.5	236	26.2
Total	438	48.6	463	51.4	901	100

A total of 901 children were surveyed of whom 48.6% were boys and 51.4 % were girls. The ratio of boys to girls was 0.94:1. The 901 children came from the 457 households surveyed in the Sool plateau of Sool and Sanaag Regions.

#### 4.7 Nutritional status of survey children using anthropometry

Table 12: Summary of Global Acute malnutrition and Severe Acute Malnutrition

Malnutrition Rates	Proportion	No.
<b>Global Acute Malnutrition (&lt;-2 Z score or oedema)</b>	13.7% (CI 11.5 – 16.1)	123
<b>Severe Acute Malnutrition (&lt;-3 Z score or oedema)</b>	3.1% (CI 2.1 – 4.5)	28

As shown on Table 7 the global acute malnutrition using W/H Z score (<-2 z-scores or oedema) was 13.7% while severe acute malnutrition (<-3 z-score or oedema) was 3.1%. Oedema cases alone accounted for 1.3%.

Table 13: Distribution of children by nutritional status (weight/ height z-score or oedema) and child sex

Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
Global acute malnutrition (W/H<-2 z score/oedema)	8.9% (CI 6.4 – 11.9)	39	18.1% (CI 14.7 – 22)	84	13.7% (CI 11.5 – 16.1)	123
Severe acute malnutrition (W/H <-3 z score/oedema)	2.7% (CI 1.4 – 4.7)	12	3.5% (CI 2.0 – 5.6)	16	3.1% (CI 2.1 – 4.5)	28
Oedema	1.6 (CI: 0.6-3.3)	7	1.1 (CI: 0.3-2.5)	5	1.3 (CI: 0.7- 2.3)	12

The global acute malnutrition among children aged 6 - 59 months in Sool Plateau was 13.7 (CI: 11.5% - 16.1%) using weight for height <-2 Z score or presence of oedema. There was a statistically significant difference in malnutrition between boys and girls, with girls being more malnourished than boys (P value = 0.00012)

Table 14: Nutrition status using W/H z-scores or oedema according to age groups

Age groups	Severe (<-3z or oedema)	Moderate (>=-3z/<-2z)	Total malnourished (<-2z or oedema)	Normal (>-2 z and no oedema)
6-11 months	3 (10.7%)	8 (8.4%)	11(8.9%)	75 (9.6%)
12-23 months	10 (35.7%)	20 (21.1%)	30 (24.4%)	131 (16.8%)
24-35 months	5 (17.9%)	17(17.9%)	22(17.9%)	174(22.4%)
36-47 months	4 (14.3%)	25 (26.3%)	29 (23.6%)	193 (24.8%)
48-59 months	6 (21.4%)	25 (26.3%)	31(25.2%)	205( 26.3)
Total	28 (3.1%)	95(10.5%)	123 (13.7%)	778(86.3%)

There was no statistically significant difference in the nutritional status between age groups. (P-value>0.365)

Table 15: Malnutrition prevalence using W/H percentage of median categories

Nutrition status categories	Males		Females		Total	
	Proportion	No.	Proportion	No.	Proportion	No.
Global acute malnutrition (W/H<80% or oedema)	5.02 (CI:3.2-7.5)	22	12.1 (CI: 9.3- 15.4)	56	8.6 (CI: 6.9- 10.7)	78
Severe acute malnutrition (W/H<70% or oedema)	2.5 (CI: 1.3-4.4)	11	2.5 (CI: 1.3- 4.5)	12	2.5 (CI: 1.6-3.8)	23
Oedema	1.6 (CI: 0.6-3.3)	7	1.1 (CI: 0.3-2.5)	5	1.3 (CI: 0.7- 2.3)	12

The global acute malnutrition among children aged 6 - 59 months using weight for height <80% of median or presence of oedema was 8.6% (CI: 6.9% - 10.7%) while the severe acute malnutrition <70% of median or presence of oedema was 2.5% (CI: 1.6% – 3.8%).

#### 4.8 Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

Table 16: Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

	Number	%
<i>Incidence of major child illnesses (n=901)</i>		
ARI	206	22.9
Diarrhoea within two weeks prior to survey	160	17.8
Malaria within two weeks prior to survey	72	8.0
Measles within one month prior to the survey	72	8.0
<i>Measles immunisation</i>		
Children receiving measles vaccination (9 - 11 months) (N=42)	25	60
Children receiving measles vaccination (12- 23 months) (N=161)	116	72
Children receiving measles vaccination (9 - 59 months) (N=857)	627	73
Verification for those vaccinated by card	287	46
<i>Children who have ever received Polio dose (N= 901)</i>		
One to two times	267	29.6
Three times	364	40.4
None	270	30
<i>Vitamin A supplementation (n= 901)</i>		
Children receiving Vitamin A supplementation in past 6 months	521	57.8

As indicated in table 16, the incidences of ARI (23%) and diarrhoea (18%) within two weeks prior to the survey were high while malaria was relatively low (8%) within the same period. The incidence of measles among the under-five population one month prior to the survey was about 8%. Measles vaccination coverage for eligible children was fairly good (73%) based on mothers recall and 46% by card verification. This is in view of the few health facilities existing. About 70% of the children had

received between 1 - 2 doses of polio while 30% had received three doses. More than half (57.8%) of the surveyed children had received Vitamin A supplementation in the last six months. About 6% the households reported problem of night blindness. Of those who had night blindness about a quarter (26%) of them were children under five while 74% were people over five years.

## 4.8 Feeding practices

Table 17: Children feeding practices

	N	(%)
<i>Are you breastfeeding child (age 6-24 months) (n=321):</i>		
Yes	100	31.2
No	221	68.8
<i>Age when child stopped breastfeeding (n=221):</i>		
0 - 5 months	59	27
6 - 11 months	69	31
12 months or more	93	42
<i>Weaning age (age 6-24 months) (n=321):</i>		
0 - 3 months	299	93.1
4 - 6 months	16	5.0
7 months or more	6	1.9
<i>Feeding frequency (n=901):</i>		
Once	98	10.9
2 times	278	30.9
3 times	465	51.6
4 or more times	60	6.7

At the time of the survey, more than about a third 31.2% of the children aged between 6-24 months were breastfeeding. Of those who had been stopped from breastfeeding, about 27% had stopped breastfeeding before six months, 31% before the first year and 42% after the first year. A high proportion (93%) of the children aged 6-24 were introduced to foods other than breast milk early in

life between the time of birth and the third month of life, 5% between 4 and 6 months, while only about 2% were introduced to complementary feeding at seven months and above. Collectively a high proportion (42%) of the children were fed between 1-2 times per day, about 52% three times and only about 7% were fed more than four times a day.

## 4.10 Dietary diversity among children

Table 18: Distribution of dietary diversity among children

No of food groups (n=901)	N	%
<= 2 food groups	179	19.9
3 food groups	361	40.1
> 4 food groups	361	40.1

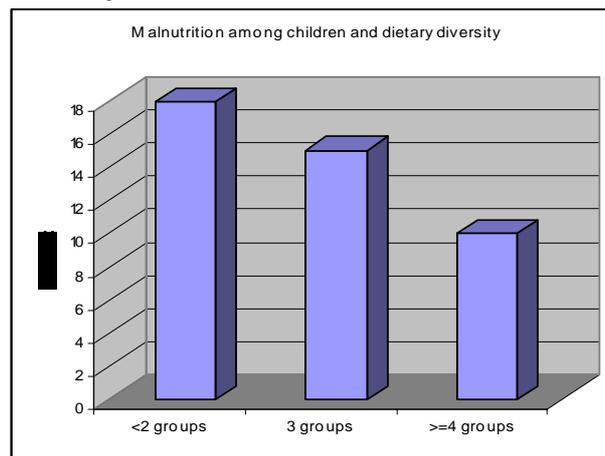
As shown on the table, most (59.9%) of the children had consumed three or less food groups<sup>3</sup> within 24 hours prior to the survey. About 40%

had consumed 4 or more food groups within the same period. The range of food groups consumed was 1 – 8. Foods rich in micro-nutrients and proteins were rarely consumed. Cereals, sugars and fats were the commonly consumed food groups and were all eaten by above 73% of the children. All other food groups were eaten by less than 5% of the children with the exception of meats, pulses and dairy eaten by about 17% to 22% of the children.

<sup>3</sup> The food groups categorisation is based on the FAO categorisation referred on pg 20

Table 19: Children nutritional status versus dietary diversity

No of food groups	Severe acute malnutrition	Moderate acute malnutrition	Normal Nutrition Status
<= 2 food groups	10( 5.6)	22( 12.3)	147( 82.1)
3 food groups	14(3.9)	41(11.4)	306(84.8)
>=4 food groups	4(1.1)	32( 8.9)	325(90.0)
Total	28( 3.1)	95(10.5)	778(86.3)



As shown on the figure, about 18% of the children who consumed two or less food groups were malnourished compared to 10% among children who had consumed four or more food groups. Dietary diversity was found to have a statistical significant association with dietary diversity ( $p= 0.02$ ).

#### 4.11 Adult Women Malnutrition

Malnutrition rates among adults were investigated using mid upper arm circumference (MUAC) measurements of women of child bearing age (15 – 49 years). Of the 429 women assessed, 11.2% (MUAC <21 cm) malnourished.

#### 4.12 Vitamin A deficiency

Table 20: Vitamin A deficiency

	N	%
<i>Night blindness n= (457)</i>		
Yes	27	5.9
No	430	94.1
<i>Persons vitamin A deficient</i>		
Below 5yrs	7	25.9
Above 5 yrs	20	74.1

Vitamin A deficiency (VAD) as assessed by way of night blindness was prevalent in 5.9% of the population. Of the vitamin A deficient cases, about 30% were underfives while the rest were above five years of age. Consumption of vitamin A rich foods (milk, fish, vegetables, meats) was minimal as observed in dietary

diversity assessment, predisposing children to vitamin A deficiency.

#### 4.13 Mortality rates

A total of 901 households were surveyed for mortality indicator with a recall period of 90 days prior to the survey being used. The results were as presented below:

Mortality rates;

For children aged 0-59 months (under-five mortality rate)

Under five population in surveyed households =1,458

Number of under five deaths =38

Under five mortality rate =2.89 deaths per 10,000 children per day

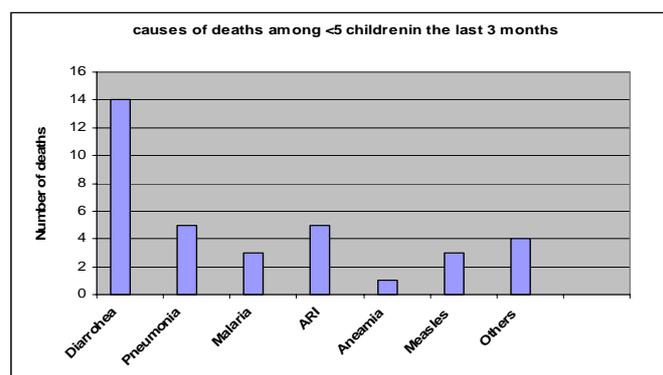
For the total population (Crude mortality rate)

Total population in surveyed households =5950

Total number of deaths in the households = 46

CMR =0.86 deaths per 10,000 persons per day

Figure 3: Causes of underfive mortality



As shown on the graph diarrhoeal diseases was the main cause of under-five mortality. Other causes of child death included pneumonia, ARI, malaria deaths at birth.

Injuries from gunshots, car accidents, ARI, diarrhoea and drowning were among the causes of death among persons above five years of age.

Table 21: Comparison of survey results

	2003 Survey		2004 Survey	
	No	%	N	%
Total children surveyed	895	100	901	100
Global Acute Malnutrition (<-2 Z scores/oedema)	112	12.5 (CI: 10.5 - 14.9)	123	13.7 (CI: 11.5 - 16.1)
Severe Acute Malnutrition (<-3 Z scores/oedema)	16	1.8 (CI: 1.1 - 3.0)	28	3.1 (CI: 2.1 - 4.5)
Oedema	5	0.55 (CI: 0.2 - 1.4)	12	1.3% (CI 0.7 - 2.3)
Underfive mortality rate	1.9 deaths/10000/day		2.89 deaths/10000/day	
Crude mortality rate	0.88 deaths/10000/day		0.85 deaths/10000/day	
ARI within two weeks prior to survey			206	22.9
Diarrhoea within two weeks prior to survey	219	24.5	160	17.8
Malaria within two weeks prior to survey	110	12.3	72	8.0
Measles one month prior to survey	33	3.7	72	8.0
Measles immunisation coverage (9-59 months)	217	26	627	73
Children receiving vitamin A supplementation six months prior to survey	427	47.7	521	57.8
Feeding Frequency of children excluding breastfeeding				
• Once	12	1.3	98	10.9
• 2 times	138	15.5	278	30.9
• 3 times	495	55.7	565	51.6
• 4 or more times	244	27.4	60	6.7
Breastfeeding of children aged 6 – 24 months (n=321)				
• Breastfeeding	172	61	100	31.2
• Not breastfeeding	110	39	221	68.8

The difference in the levels of global acute malnutrition in both surveys is not statistically significant although the rates remain higher than those seen in similar communities in the country. With the exception of measles, overall morbidity had decreased while vitamin A supplementation had increased. Under five mortality rate had increased to the alert level.

#### 4.14 Relationship between malnutrition and other factors

The risk factors that had a significant association with malnutrition was child sex, malaria and dietary diversity.

Table 22: Risk factors and relation to total malnutrition

Exposure variable	N	(%)	Crude RR	95% CI	p-value
<i>Household head sex</i>					
Male	86	13.4	0.95	0.66	0.85
Female	37	14.2		1.36	
<i>Sanitary facility:</i>					
Pit latrine/flush toilet	12	10	0.7	0.4 – 1.24	0.26
Bush/open ground	111	14.2			
<b>Child sex:</b>					
<b>Male</b>	39	8.9	2.04	1.43	<b>0.000</b>
<b>Female</b>	84	18.1		2.91	
<i>Age group:</i>					
6-23	41	16.6	1.32	0.94	0.14
24-59	82	12.5		1.87	
<i>Diarrhoea:</i>					
Yes	30	18.8	1.49	1.03	0.05
No	93	12.6		2.17	
<b>Malaria:</b>					
<b>Yes</b>	16	22.2		1.08	
<b>No</b>	107	12.9	1.72	2.75	<b>0.04</b>
<i>Measles:</i>					
Yes	14	19.4	1.48	0.9	0.18
No	109	13.1		2.44	
<i>Vitamin A:</i>					
Yes	69	13.2		0.67	
No	54	14.2	0.93	1.30	0.74
<i>ARI</i>					
Yes	34	16.5	1.29	0.9	0.21
No	89	12.8		1.85	
<i>Breastfeeding</i>					
Yes	17	17	1.21	0.7 – 2.08	0.6
No	106	14			
<b>Dietary diversity</b>					
<b>&lt; = 3 food groups</b>	87	16.1	1.62	1.12	
<b>&gt;= 4 food groups</b>	36	10.0		2.33	<b>0.011</b>

Children with malaria were more likely to be malnourished compared to those not suffering from malaria in the last two weeks prior to the survey. Girls were two times more likely to be malnourished than boys. Additionally, children who ate three or less food groups were 1.6 times more likely to be malnourished than their counterparts who ate four or more food groups.

Further analysis revealed no statistical significant association between malnutrition and household head sex, sanitary facility, child's age group, diarrhoea, measles, vitamin A supplementation, ARI and breastfeeding.

#### 4.15 Qualitative information

Qualitative information was collected from focus group discussions and key informants. A total of six focus group discussions were held, four with mothers and two with men. The discussions were centred around feeding and care practices, health care, food security, water and sanitation issues.

##### Care and feeding practices

Like most other parts of Somalia, breast feeding and complementary feeding was found to be sub-optimal. Majority of the mothers give water and sugar (*Fax*) within a few hours after delivery and start breastfeeding within 24 - 48 hours. Reasons given for not starting breastfeeding immediately was that the mother has no milk, that the baby lacks strength to suckle, the mother has abdominal pains and breastfeeding increases bleeding. In addition to the *Fax* and breast feeding, the infants are introduced to goats or cows milk within the first month while other semi solid foods such as porridge are introduced between 2 and 3 months.

The most common food fed to young children is light porridge made from sorghum or maize flour with sugar and milk added. Rice with milk, sugar and ghee, oil, spaghetti and Anjera (Somali pancake) are among other foods fed to the children. Usually children are fed four or more times a day in normal times but this had changed recently. At the time of the survey, it was revealed that there was further reduction in the number of meals among the children from the usual 3-4 to 1-2 per day in several households, while the adults were mainly having one meal per day. It was noted that children were always given priority in feeding during normal and crisis times. It was also noted that due to the reduced numbers of livestock majority had no access to milk, which usually is a key food for children. Hence children from poor families were being fed mainly on sorghum or maize porridge and occasionally rice or Anjera.

Qualitative data further revealed that when children were sick certain foods are withheld, for example if a child has diarrhoea, milk is withheld. The drought had also affected the care aspects of children in the sense that mothers spent a lot of time outside the home looking for loan, casual work or even borrowing food. Women also reported to have reduced breastfeeding their children since they also lacked enough food to feed themselves.

##### Food security

The Gu rains set in late were inadequate and unevenly distributed, only localised in some areas e.g. Balibusle, Baraagtaq, Elbur, Fadhigaab, Awarbogays, Gowsowyne and Sinaaro. Much more promising although still scattered rains were received during the month of May 2004 in most parts of the plateau, resulting in accumulation of water in the various water sources. Consequently, this attracted the return of most livestock from the Nugal Valley among other areas. It was observed that the impact of the drought, migration, and deteriorating purchasing power was more on poor pastoralists than on the middle and the wealthy groups since the latter can afford to migrate or truck their animals to other locations.

It was further indicated that the household level coping mechanisms have been overstretched. Some poor households have resulted to extreme coping mechanisms for example, skipping entire days without a meal. Wide-spread animal deaths or even loss of family's entire livestock were common. Remittances and social support, both from abroad and locally, are important sources of relief for pastoral families. However, loss of assets due to the prolonged drought has made it increasingly difficult for the normal social institutions to cope with the magnitude of problems being experienced in the area.

**Health related issues**

The most common diseases among children reported at the time of the survey were ARI, diarrhoea and malaria. There were also reports of some cases of measles. Although health posts are available the community felt that the Community Health Workers did not have adequate skills to provide quality health care. .Additionally the focus group discussions revealed that residents of some of the villages have to walk approximately 20-30kms to reach the nearest health facility. The health facilities are unevenly distributed hence limiting their use.

## 5 DISCUSSION

### 5.1 Food security situation: Livelihood means, Assets ownership and Coping mechanisms

In Sool plateau the sale of livestock and livestock products (milk, ghee and skins) provide the main income sources, out of which households purchase food and non- food items. In view that there have been significant losses of livestock (about 90% of the pastoralists have lost 50% or more if not all their camels and about 87% have lost 50% or more if not all of their shoats over a three years period) pastoralists have continued to experience difficulties in accessing food since the last survey in May 2003. Livestock production (milk) is negligible. Furthermore, minimal milk is available for household consumption which is particularly important for children. According to the interagency assessment in October 2003, camels failed to conceive during the last *Gu* 2003 season (the breeding male didn't rut and females were weak). The next conception opportunity was expected in *Gu* 2004 which means the first offspring (if conception is successful) will be born in *Gu* 2005, and there will be limited camel milk available for sale or consumption until then. Recovery from the livestock losses to a normal situation will take time as the majority particularly the poor and middle level wealth group have depleted their assets. Similarly the livestock production will take time before going back to normal as currently the body condition of all species is still very poor. Although food is available in the market the majority reported that it was not readily accessible due to reduced purchasing power.

Pastoralism is usually the main means of livelihood for majority of the population in the plateau. The survey findings shown that self employment or petty trade was the main means of livelihood for about 50% while pastoralism was reported by about 37%. This indicates a shift in the peoples way of life and can be attributed to the significant livestock losses. The forms of petty trade that the population engaged in include charcoal trade, tea shops and sale of firewood. Qualitative data reported that the plateau population are currently surviving. All the surveyed households were employing at least one or more of known coping mechanisms with at least 55% or more resorting to purchasing food on credit, borrowing or relying on relatives or reducing the number of meals eaten in a day. The fact that a high proportion was purchasing food on credit or borrowing has increased the debt burden of the people and repayment may be difficult since they have already lost virtually all their assets. Even with a normal Deyr season it still remains difficult for the population to recover.

### 5.2 Interventions

Substantial interventions both informal and formal have been implemented in Sool and Sanaag regions since December 2003. The coverage of these interventions not only includes the plateau but also other parts like Nugal valley and Gebi valley livelihood zones as described in section 2.3. However, the nutrition survey only covered the Sool plateau livelihood zone. About half of the surveyed population had benefited from one or more of the formal interventions while about 24% had received some form of informal support three months prior to the survey. Social support networks have played a key role in maintaining the Sool plateau population but as more people continue losing assets, it is becoming increasingly difficult for keens to adequately support each other. Overall, the ongoing interventions have gone a long way in preventing deterioration of the situation in the Plateau, maintaining the malnutrition levels at similar levels.

### 5.3 Health issues influencing nutritional status

The relationship between diseases and nutrition is well documented. Repeated attacks of diarrhoea for example are associated with poor nutrient absorption and considerable nutrient losses. The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection resulting in a vicious cycle of infection and malnutrition.

At the time of the survey incidences of common infections among children within two weeks prior to the survey were high with diarrhoea at 18%, ARI 24%, measles 8% and malaria 8%. However the rates are lower than those observed in 2003 with the exception of measles. Malaria showed a significant relationship with malnutrition. Children with malaria were 1.72 times more likely to be malnourished than those without malaria. Diarrhoea was the leading cause of mortality among underfives. Although the majority of households sought health care when a member was sick, mainly from private clinics/pharmacies, it becomes extremely difficult to establish the efficacy of these health provision systems. Only a minority (5.7%) sought healthcare from public health facilities. Availability of functional public health facilities is limited to two MCHs namely Dhahar and Ceel Afweyn further limiting regular access to health care services especially for the poor who may not afford the same from private facilities. The focus group discussions further revealed that the residents sought medical care for children only when the child got worse and home remedies had failed. Late treatment of diseases prolongs the diseases paves way for malnutrition.

An increase in vitamin A supplementation and measles immunisation coverage was noted which has an overall effect of enhancing the population immunity. This was attributed to the improved access to health services through the ongoing interventions during which child immunisation, treatment of diseases and vitamin A supplementation are undertaken.

### 5.4 Water and Sanitation

At the time of the survey only a small proportion (8%) of the population were relying on protected sources of water for drinking, the remaining majority about (92%) were obtaining drinking water from unprotected sources (rain water from catchments/ponds or unprotected well or spring). In the previous survey a higher proportion (68%) was obtaining water from protected sources either berkads or boreholes. Access to safe water has slightly decreased compared to May 2003. The high incidences of diarrhoeal diseases among children revealed in the survey are strongly attributed with the reduced availability and consumption of safe water as well as poor personal and food hygiene with a high proportion of the households not washing hands regularly before eating. Human waste disposal practices are suboptimal, about 87% use open ground or bush for a sanitation facility increasing the risks of contaminating water in unprotected sources.

### 5.5 Childcare care practices

WHO and UNICEF recommend that infants be exclusively breastfed at least for the first six months of life. Feeding children with foods and fluids other than breast milk during this period significantly reduces breast milk supply, and increases the risks of deaths from diseases like diarrhoea.

Overall, child feeding practices were found to be sub-optimal among children aged 6-24 months. Among children of breast feeding age, the proportion still breastfeeding reduced from 61% in the previous survey to 31%. Likewise the proportion of those who had stopped breastfeeding was higher about 68% compared to 39% in 2003. This can be attributed to

the high demand of women's time, leaving children for long hours as they engage in casual employment and search for loans to buy food. Additionally, mothers were opting not to breastfeed their children due to lack of enough foods to feed themselves too as was noted in the focus group discussions. In addition to inadequate food the stress being experienced by mothers as they look for food may have also affected their milk production.

A high proportion (93.1%) of the children aged between 6 and 24 months were introduced to foods other than breast milk very early in life between 0-3 months. The results further indicate reduction on frequency of feeding of children. The proportion of children feeding few times per day between 1-2 times increased by more than half from about 17% in 2003 to 42%. At the same time the proportion of children feeding more than 4 times reduced, only about 7% of the children were feeding more than 4 times per day compared to 27% in 2003. Inadequate care for both mothers and children remains an underlying cause of malnutrition in the plateau.

## 5.6 Nutritional status

The survey results indicate persistently high malnutrition with no difference in the nutritional status of the population since the previous survey in May 2003. The global acute malnutrition rate (weight for height  $<-2$  Z score or oedema) was 13.7 % compared to 12.5 % recorded in May 2003 survey. Severe acute malnutrition was 3.1% compared to 1.8 % in 2003 with oedema cases having increased from 5 to 12 cases. The malnutrition levels indicate a serious situation according to WHO classification of malnutrition levels of public health significance. Additionally, the rates remain higher than those seen in similar communities in the country. The level of adults malnutrition is high though since the status was not assessed in 2003, it is difficult to make comparisons. The underfive mortality rate increased to an alert level of 2.89 deaths/10000/day from 1.9 deaths/10000/day in May 2003 suggesting that the overall well being of the population is worse than it was in 2003.

The malnutrition rates by sex were statistically significant with more girls (18.1%) being malnourished than boys ( $p<0.05$ ); a factor that will require further investigation. Malaria and dietary diversity both showed a statistically significant association with malnutrition. About 80% of the children were consuming three or more food groups over the past twenty four hours to survey. In order of importance, cereals, sugar and fats/oil were the main food groups consumed. The main foods given during the ongoing free food distribution in the plateau are cereals, sugar, fats/oil and pulses which are only distributed by WFP. It appears that the food distribution contributed to the dietary diversity, ultimately preventing a deterioration of the nutritional status. Limited consumption of other food groups like vegetables and fruits, which are good sources of essential micronutrients also limits accessing essential nutrients for growth. The survey indicates that vitamin A deficiency is prevalent in the area among both adults and children.

## 6 CONCLUSIONS AND RECOMMENDATIONS.

The nutrition situation in the plateau still remains poor. Food insecurity, poor care practices and disease tend to counter the effects of humanitarian efforts. Therefore concerted humanitarian efforts are still essential in the plateau. This will prevent a deterioration of the nutrition situation. Even with a normal Deyr 2004 season, recovery at the plateau will take time and strategies of helping the community regain their assets are essential.

Following the presentation of preliminary survey results and discussions of the same with partner agencies the following recommendations have been made.

- a. Continuation of targeted food distribution in the highly vulnerable areas of the plateau for next 2-3 months assuming proper 2004 Deyr rains.
- b. Continuation of supplementary feeding programme for pregnant/lactating mothers and children under five years in the plateau also in the next 2-3 months and treatment of the severely malnourished children assuming proper 2004 Deyr rains.
- c. Continued close monitoring the food security and nutrition situation in the area/intensification of surveillance activities.
- d. Intensify promotive and preventive health care interventions focusing on immunisation, hygiene, and control of water related diseases. Additionally, improve access to public health facilities.
- e. Promote nutrition education through the MCH/outposts focusing on breastfeeding, complementary feeding and frequency of feeding of infants and young children as well as feeding of sick children.
- f. Rehabilitate run-down boreholes, berkads and dams with an aim of ensuring water availability for both human and livestock in the long run.
- g. Promote alternative income generating activities through a credit programme to reduce over-reliance on livestock sources of livelihood.

## 7 APPENDICES

### Appendix 1: Sampling Frame for the Sool & Sanaag Sool Plateau Survey, June 2004

S/NO	VILLAGE	FOOD ECONOMY ZONE	ESTIMATED POPULATION	CUMULATIVE POPULATION	CLUSTER NUMBER
1	Awr-Bogays	Pastoral	5000		1,2
2	Kulaal	Pastoral	1500	6500	
3	Sarmaanyo	Pastoral	4000	10500	3,4
4	Laso-Curdan	Pastoral	1000	11500	
5	Qandhilecile	Pastoral	1000	12500	5
6	Habaaloamre	Pastoral	500	13000	
7	Xadhan	Pastoral	800	13800	
8	Sufur Wayne	Pastoral	500	14300	6
9	Dhaban	Pastoral	750	15050	
10	Daraymadoobe	Pastoral	400	15450	
11	SamirGood	Pastoral	700	16150	
12	Xaabo Deri	Pastoral	200	16350	7
13	Goof	Pastoral	500	16850	
14	GodCanod	Pastoral	1000	17850	
15	Ceeryaan	Pastoral	1000	18850	8
16	Sugbo	pastoral	500	19350	
17	GarabCade	Pastoral	150	19500	
18	Xamlika	Pastoral	800	20300	
19	Midhacaanyo	Pastoral	500	20800	
20	Fiqiga	Pastoral	1500	22300	9
21	Booda Cade	Pastoral	800	23100	
22	Gelisle	Pastoral	700	23800	10
23	Beer Wayso	Pastoral	600	24400	
24	DararWayne	Pastoral	2000	26400	11
25	Dalya	Pastoral	500	26900	
26	Dogoble	Pastoral	800	27700	
27	Bohol	Pastoral	1200	28500	12
28	Shoodhe	Pastoral	200	28700	
29	Karin Biyood	Pastoral	400	29100	
30	Kalshiikkh	Pastoral	700	29800	
31	Kurxero	Pastoral	500	30300	13
32	Caadayo	Pastoral	400	30700	
33	Mooda	Pastoral	400	31100	
34	Dhanbacal	Pastoral	700	31800	
35	Dibqarax	Pastoral	100	31900	
36	BiyoGuudud	Pastoral	200	32100	
37	DuudCas	Pastoral	300	32400	
38	Ardaa	Pastoral	800	33200	14
39	Arden labi	Pastoral	300	33500	

40	Dhabaro	Pastoral	800	34300	
41	LayMadh	Pastoral	500	34800	15
42	Guryo San	Pastoral	500	35300	
43	Dhadhin Yaxy	Pastoral	600	35900	
44	Jed Xilood	Pastoral	400	36300	
45	Kulaal( Jeexa)	Pastoral	700	3700	
46	Camayulug	Pastoral	500	37500	16
47	Siiga Dheer	Pastoral	800	38700	
48	Far Dhidar	Pastoral	400	38700	
49	Ceel Nimcoon	Pastoral	600	39300	
50	Ceel Afwayn	Pastoral	5800	45100	17,18,19
51	Suuf Dheere	Pastoral	800	45900	
52	DanWayn/Eil Ofwayn	Pastoral	900	46800	20
53	Carmale	Pastoral	600	47400	
54	Dhanaan	Pastoral	500	47900	
55	Shimbiraale	Pastoral	800	48700	21
56	Dawaco	Pastoral	300	49000	
57	Damalehagare	Pastoral	1000	50,000	
58	Sibaayo	Pastoral	50	50050	
59	Qoyan	Pastoral	500	50550	
60	Xingalool	Pastoral	3000	53550	22, 23
61	Wardheer	Pastoral	1000	54550	
62	Baraagtagol	Pastoral	1500	56050	24
63	QolofWayne	Pastoral	400	56450	
64	Dhahar	Pastoral	6000	62450	25,26
65	Balli Basle	Pastoral	1000	63450	27
66	Xaaris	Pastoral	400	63850	
67	Habarshile	Pastoral	700	64550	
68	Gooran	Pastoral	200	64750	
69	Maygaag	Pastoral	400	65150	28
69	Kala dhac	Pastoral	700	65850	
70	Ceel Buh	Pastoral	1800	67650	29
71	Danabbilis	Pastoral	200	67850	
72	Dikhsule	Pastoral	500	68350	
73	Durdur	Pastoral	600	68350	
74	Shidaleh	Pastoral	600	69550	30

Cluster sampling interval 2318 and the first random number 2308



- Q28** When your child is sick, do you seek assistance? 1= Yes 2=No  
**Q28a** If yes where do you seek assistance? 1= Traditional healer 2= Private clinic/Pharmacy 3= Public health facility 4= Other specify \_\_\_\_\_  
**Q28b** If No, why? \_\_\_\_\_
- Q29** Does any member of this household have difficult seeing at night or in the evening when other people do not? 1= Yes 2= No  
**Q29a** If yes specify member 1= < 5 years 2 = > 5 years

**Q30 - 36 Anthropometry for children aged 6 – 59 months (or 65 – 110cm) in the household**

SNo	Name	Q30 Sex (F/M)	Q31 Age in months	Q32 Oedema (Yes/No)	Q33 Height (cm)	Q34 Weight (kg)	Q35 MUAC (cm)	Q36 Received UNIMIX in past 6 months (Yes/No)
1								
2								
3								

**Q37** What is the MUAC measurement of the childs mother? \_\_\_\_\_

**Q38 Consumption Coping Strategies**

In the past 30 days, if there have been times when you did not have enough food or money to buy food, how often has your household had to:	Relative Frequency				
	All the time? Every day	Pretty often? 3-6 */week	Once in a while? 1-2 */week	Hardly at all? <1 */ week	Never 0*/week
a. Switch from high quality to low quality less expensive foods?					
b. Borrow food, or rely on help from a friend or relative?					
c. Purchase food on credit?					
d. Gather wild food or hunt?					
e. Sell livestock at give-away price to buy staples?					
f. Send household members to eat elsewhere?					
g. Send household members to beg?					
h. Limit portion size at mealtimes?					
i. Restrict consumption of adults in order for small children to eat?					
j. Feed working members of HH at the expense of non-working members					
k. Ration the money you had and buy prepared food?					
l. Reduce number of meals eaten in a day?					
m. Skip entire days without eating?					
n. Deplete assets to get food, i.e. sell livestock, land, jewelry, etc)?					

**Q 39 Dietary Diversity**

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

Food consumption and source of food, source of income for food purchases	Beginning yesterday when people woke up, did any of these members in your household consume these foods. 1=Yes 0=No	Codes:	
		0=none	1= once
What members of this household consumed these foods in the last 24 hours?		2= twice	3=3 times 4=4 times
		5=5 or more times	
Type of food		Freq. (<5yrs)	Freq- >5yrs
a) Cereals/staples (rice, wheat, pasta, sorghum, maize)			
b) Beans and other pulses/legumes			
c) Dairy and dairy products (milk)			
d) Fish/ sea foods			
e) Eggs			
f) Meat/offal			
g) Sugar in tea and others			
h) Fats/oils/ghee			
i) Roots and tubers			
j) Fruits			
k) Vegetables			
i) Beverages, spices & other products			

**Q40-45 Access to water for Human Consumption (quality and quantity)**

- Q40** Main source of drinking water 1 = piped 2 = public tap 3 = Tube well/borehole 4= protected well or spring 5 = Rain water 6= unprotect spring and well 7= river 8= other  
**Q41** Main source of water for cooking and personal hygiene 1 = piped 2 = public tap 3 = Tube well/borehole 4= protected well or spring 5 = Rain water 6= unprotect spring and well 7= other  
**Q42** Average household water use per day per household for drinking, cooking and personal hygiene is 1= 0-2 litres 2 = 3 – 5 litres 3 = 6-10 litres 4= 11-15 litres 5= more than 15 litres  
**Q43** Distance to the nearest water point 1= 0-500 metres 2 = 501 – 1000 metres 3= 1001 – 5000 metres 4 = more than 5000 metres  
**Q44** Water and systems are maintained such that quantities of water are available 1 = never 2 = sometimes 3 = almost always 4= always  
**Q45** Number of clean water storage containers of 20 litres 1= 1-2 containers 2 = 3-4 containers 3 = 4-5 containers 4= more than 5 containers

**Q46-50 Sanitation and Hygiene (access and quality)**

- Q46** Type of toilet used by most members of the household 1= Improved pit latrine 2=Traditional pit latrine 3=Open pit 4= Bucket 5=Bush 6= Other  
**Q47** Number of people who use the same toilet 1= 1-5 people 2= 6-10 people 3 = 11-15 4= 16 – 20 people 5= more than 20 people 6= Not applicable  
**Q48** Household members wash their hands after defecation 1= always 2= often 3=sometimes 4= hardly rarely  
**Q49** Household members wash their hands before eating or food preparation 1= always 2= often 3=sometimes 4= hardly rarely  
**Q50** Distance between toilet and water source 1 = 0 – 5 metres 2= 6 – 10 metres 3= 11- 20 metres 5= 21 - 29 metres 5= 30 metres or more

**Q51 - 52 Formal and Informal Support or Assistance in last three months (circle all options that apply)**

**Q51** Informal support received in last three months 1= Yes 2=No

**Q51a** Amount and Frequency of each

Type of support	Frequency	Amount (Where applicable)
1=Zakat from better-off households		
2=Remittances from Abroad		
3=Remittances from within Somalia		
4=Gifts		
5=loans		
9=Other (Specify) _____		

**Q52** Formal international or national aid support received in last three months 1= Yes 2=No

**Q52a** Amount and Frequency of each

Type of support	Frequency	Amount (Where applicable)
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=Other (Specify) _____		

## Appendix 3: Sool Plateau of Sool & Sanag Nutrition Survey Questionnaire - Somali Version

### Foomka Sahanka Nafaqada-Sool Plateau (Sool and Sanaag)

Taariikh \_\_\_\_\_ Numberka Kooxda \_\_\_\_\_ Numberka goobta \_\_\_\_\_ Magaca kormeeraha \_\_\_\_\_ Magaca degmada \_\_\_\_\_  
Magaca xaafadda/Magaalada \_\_\_\_\_ Magaca waaxda \_\_\_\_\_ Numberka qoyska \_\_\_\_\_ Magaca madaxa qoyska \_\_\_\_\_

#### S1-14 Astaamaha qoyska

**S1** Waa maxay jinsiga madaxa qoyska? 1=Lab, 2=Dhedig

**S2** Immisa ruux baa ku nool qoyska (Tirada)? \_\_\_\_\_

**S3** Immisa ruux baa ka yar shan sano qoyskan (Tirada < 5 Sano)? \_\_\_\_\_

**S4** Waa xagee degaanka aad rasmi ahaan u deggan tahay (degmo iyo xaafad) Degmo: \_\_\_\_\_ Xaafad: \_\_\_\_\_  
**Q4a Hadda.** waa maxay xaaladda deegaan ee qoyska? (Haddii jawaabtu tahay 1, u gudub su'asha 8aad) 1= Degaan 2=Soo barakacay 3= Soo noqday (qaxootinimo)

4= gudaha degaankiisa ku barakacay 5=Waxyabo kale Caddee \_\_\_\_\_

**S5** Xaggee ka timid inta aadan halkan soo degin? (Meesha asal ahaan aad ka timid) \_\_\_\_\_

**S6** Muddo intee la'eg ayaad halkan ku nooleyd? \_\_\_\_\_

**S7** Waa maxay sababta aad halkan u timid? (waad xulan kartaa wax hal doorasho ka badan hadday haboonaato): 1= nabadgelyo xumo 2=Shaqo laaan 3= Cunto yaraan 4=Biyo yaraan  
5=Daaq yaraan 6=Waxyabo kale caddee \_\_\_\_\_

**S8** Ma jiraa xubin (xubno) qoyska ah oo si joogto ah xoolaha ula hayaama? 1=Haa 2= Maya

**Q8a Haddii S8aad haa tahay, u gudub su'aasha 9aad**

**Q8b haddii S8aad maya tahay,** goorma ayuu qoyska joojiyey hayaaminta xoolaha (Bisha iyo Sanadka) \_\_\_\_\_

**Q8c If S8aad maya tahay,** Muxuu qoysku u joojiyey hayaamintii xoolaha \_\_\_\_\_

**S9** Goormaa ugu dambaysay in xubnaha qoysku hayaamiyaan xoolo? Bisha \_\_\_\_\_ Sanadka \_\_\_\_\_

**S10** Xaggee xubnaha qoyskani u hayaameen waqtigaas? \_\_\_\_\_

**S11** Ma jiraan xubno qoyska ah oo looga tegay degaanka xilligii hayaanka? 1=Haa 2= Maya

**S11a** Hadday haa tahay kumuu ahaa ruuxa laga tegay? 1= Haa 2= Carruur 3= Waayeel

**S12** Ma soo laabteen dadkii la hayaamay xoolah? 1=Haa 2=Maya

**S13** Sidee bay xoolaha u kaxeeyeen? 1= Ayagoo adeegsanaya gawaari waa weyn 2=Lugeysiin

**S14** Waa maxay hab nololeedka ugu badan ee qoyskani isticmaalo? 1= Xoolo dhaqasho 2=Iskii uga shaqeysta degaankiisa 3=Ganacsi yar yar 4=Waxyabo kale caddee \_\_\_\_\_

#### S15-16 Lahaansho xoolo iyo berkad:

Hantida Qoyska	Q15 Hadda Tirada	Q16 Ka hor 3 sano Tirada
1. Ari (riyo iyo ido)		
2. Geel		
3. Berkado		

**Q17-27 Cudurada, quudinta iyo Tallaalka ee caruurta 6 – 59 bilood (ama 65 – 110cm).**

Taxa	Magac	Q17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27
		Shuban labadii 7aad ee la soo dhaafay  1= Haa 2= Maya	Oofw areen (burukiito ) labadii7a ad ee la soo dhaafay  1= Haa 2= Maya	Duu mo labadii 7aad ee la soo dhaafay  1=Ha a 2=Maya	S22  Jadee co Bishii la soo dhaafay  1= Haa 2= Maya	Laga talaaley jadeeco 1=lixdii bilood la soo dhaafey (kaar) 2=Lixdii bilood la soo dhaafey (xusuus) 3=Lix bilood ka hor (kaar) 4=Lix bilood ka hor (xusuus) 5=weligii lagama talaalin	La siiyey VitaminA lixdii bilood ee la soo dhaafey	Hadda ma nuujisaa ilmaha  1=Haa 2=Maya	Haddaadan nuujin immisa jir buu ahaa markii laga guriyey?  1= Ka yar 6 bilood 2= 6 – 11 bilood 3=12 – 18 bilood 4=18 bilood ama ka badan 5= Weligii lama nuujin	Imisa jir buu ahaa cunuga markii la siiyay biyo/cuntadii ugu horeysay ee aan aheyn caanaha naaska  1= 0-3 bil 2= 4-6 bil 3= 7 bil ama ka badan	Imisa jeer baad quudisaa cunuga maalintii  1= hal jeer 2 = laba jeer 3 = 3 - 4 jeer 4 = 5 jeer ama in ka badan	Imisa jeer ayaa afka laga siyey Talalka dabeysha weligiis.  1= 1-2 jer 2 = 3 & ka badan 3 = Lama siin weligiis
1												
2												
3												

**S28 Kaalmo ma raadsataa markuu ilmuhu kaa xanuunsado? 1= Haa 2=Maya**

**S28a** Hadday haa tahay xaggee ka raadsataa? 1= dhaqatar dhaqameedr 2= Xarun caafimaad gaarah/farmashiye 3= xarun caafimad oo dadka u dhexaysa  
4= wax kale, caddee \_\_\_\_\_

**S28b** Hadday maya tahay waa maxay sababtu? \_\_\_\_\_

**S29** Ma jiraa xubin (xubno) qoyska ah dhibaato xagga aragtida ah qaba habeenkii ama fiidkii, taas oo xubnaha kale aysan la wadaagin ?

1= Haa

2= Maya

**S29a** Hadday **S29** haa tahay, Caddee 1= < 5 Sano 2 = > 5 ano

**S30 - 36 18 Miisaamidda iyo dhererinta ilmaha da'dooda u dhexeyso 6 – 59 bilood (ama 65 – 110cm) ee qoyska**

Tirada Taxan	Magac	S30 Jinsi(F/ M)	S31 Da'da oo bilo ah	S32 Barar (Haa/Maya)	S33 Dherer (cm)	S34 Culeys (kg)	S35 Cudud cabir (cm) (MUAC)	S36 Ma la siiyey UNIMIX lixdii bilood ee tegtay 1=Haa 2=Maya
1								
2								
3								

S37 waa maxay cabbirka cududa hooyada dhashay ilmahan (MUAC)? \_\_\_\_\_

### Q38 La Tacaalidda Duruufaha

30kii maalmood ee tegey, haddii aadan haysan cunto kugu filan ama lacag aad ku iibsato raashin sidee buu qoysku badanaaba ka yeeli jirey?	Inta jeer				
	Waaqitoo idil? Maalin kasta	In badan? 3-6 */week	Marmar 1-2 */week	Dhif iyo naadir <1 */ week	Marnaba 0*/week
a) Ka wareegid cuntada tayada sare leh, u leexasho mid leh tayo hoose oo ka jaban?					
b) Deysasho cunto ama ku tiirsanaan caawinaad ka timaada saaxiib ama qaraabo?					
c) Ku soo iibsataa cuntada deyn?					
d) Soo gurasho cuntada duurka laga helo iyo ugaarsi					
e) Ku gadid xoolahaaga qiimo aan u qalmin si aad ugu so iibsato cuntada lama huraanka ah.					
f) u dirid xubin qoyska ah si uu uga soo cunteeyo meel kale					
g) Yareyn xaddiga cuntada ee la cuno wakhtigiiba (3da wakhtiba)?					
h) Yareyn cuntada la siiyo dadka waaweyn si carruurta yar yar u helaan waxay cunaan?					
i) Beekhaami lacagtaada oo soo iibso cunto diyaarsan (Karsan)					
jl) Yaree inta goor ee maalinkii wax la cuno					
k) Maalmo dhan oo aan wax la cunin					
l) Dabar goyn hantidaadii ma guurtada ahayd, si aad cunto u hesho (Gadasho dhulkaaga, xoolahaaga iwm) IWM)					

### Q 39 Kala Duwanaanshaha Cuntada

Xasuusasho waxa qoyskani cunay 24kii saaz ee tegay: Wareystahu ha habsado in shalay ay u ahayd maalin caadi ah qoyskan. Haddii ay jiree feestooyin aan caadi ahayn, Tacsii IWM ama xubnaha qoysku intooda badan maqan yihiin u soo noqono maalin kale ama ku baddalo qoyskan mid kale'.

Cuntada la cunay iyo isha ay ka soo jeedo, isha dakhliga cuntada lagu soo gatay ay ka timid?	laga soo bilaabo shalay markii la soo toosay maxay xubnaha qoyskani ka cuneen cuntooyinkan	0=Waxba 1= Hal mar 2= Laba goor 3=Saddex goor 4=4 Goor 5=5 goor iyo ka badan
Waa maxay waxa xubnaha qoyskani cuneen 24 kii saac ee la soo dhaafay	1=Haa 2=maya	
Nooca cuntada		Inta jeer (<5yrs)
a) Firiley/Cuntada rigliga ah (Bariis, Qamadi, Baasto, Mesago, Galley)		Inta jeer >5yrs
B) Noocyada digiraha		
c) caanaha iyo wax laga soo saaro		
d) kalluunka iyo cuntada badda		
e) ukun		
f) Hilib/uurku jirta		
g) Shaah sonkor leh ama cunto kale oo sonkor leh		
h) Dufan/saliid/subag		
i) xidida dhirta iyo buruqda laga cuno		
j) Fruits (cambe, liin, bombelmo IWM)		
k) Khudaarta cagaaran		
i) Cabitaan,xawaash		

**Q40-45 Helitaanka biyaha Aadamigu Cabb0 (Tiro iyo Tayo)**

**S40** Isha ugu badan ee laga helo Biyaha la cabo 1) pipe lagu keenay 2) Tubo 3) Ceel riig ah (mator leh) 4) Ceel daboolan 5) Biyo xareed ah 6) war iyo ceel aan daboolayn

**S41** halka ugu badan ay ka yimaadaan biyaha wax lagu karsado ama la isku nadifiyo 1) pipe lagu keenay 2) Tubo 3) Ceel riig ah 4) Ceel daboolan 5) Biyaha roobka 6) war iyo ceel aan daboolnayn

7) Webi 8) meelo kale ,Caddee, \_\_\_\_\_

**S42** Celceliska biyaha qoysku uu u isticmaalo Karin iyo nadaafadda jirka waa 1= 0-2 litir 2 = 3 – 5 litir 3 = 6-10 litir 4= 11-15 litir 5= Ka badan 15 litir

**S43** Fogaanta goobta biyaha ee ugu dhaw 1= 0-250 mitir 2= 251-500 mitir 3= 501-750 mitir 4= 751-1000 mitir 5= ka badan 1000 mitir

**S44** Biyaha iyo habka lagu helaba waa la ilaaliyey (La xafidey) sidaa darteedna cadadkii loo baahnaa waa diyaar 1= Marnaba 2= Marmar 3= ugu dhawaan had iyo goor 4= Had iyo goor

**S45** Tirada Caagaga biyaha lagu soo dhaansho (10-20 litres) ee qoyskan waa 1=1-2 2= 3-4 3= 4-5 5= ka badan 5 caag

**Q46-50 Fayadhawrka iyo Nadaafadda (Helitaan iyo Tayaba)**

**Q46** Nooca musqusha inta badan xubnaha qoysku isticmaalaan waa: 1= Musqul god la sii hagaajiyey 2= Musqul god caadi ah 3= Musqul god dusha ka furan 4= Duurka 5= Kuwa kale \_\_\_\_\_

**Q47** Tirada dadka hal musqul wada isticmaala waa: 1= 1-5 qof 2= 6-10 qof 3 = 11-15 qof 4= 16 – 20 qof 5= ka badan 20 qof 6= aan waafaqsaneyn midna

**Q48** Xubnaha qoysku ma dhaqdaan gacmaha musqusha ka dib 1= Had iyo goor 2= Badanaa 3= Marmar 4= Dhif iyo naadir

**Q49** Xubnaha qoysku ma dhaqdaan gacmaha diyaarinta iyo cunitaanka ka hor 1= Had iyo goor 2= Badanaa 3= Marmar 4= Dhif iyo naadir

**Q50** Fogaanta u dhaxeysa musqusha iyo isha biyaha 1 = 0 – 5 mitir 2= 6 – 10 mitir 3= 11- 20 mitir 5= 21 - 29 mitir 5= 30 mitir ama ka badan

**Q51 - 52 Taageerada toosan iyo midda dadban ee qoysku helay 3dii bilood ee la soo dhaafey (goobo geli dhamaan doorashooyinka ku habboon)**

**Q51** Kaalmo dadban (aan rasmi ahayn) ma helay qoyskan 3dii bilood ee la soo dhaafey? 1= Haa 2= Maya

**Q51a** Cadadka iyo Inta jeer

Nooca kaalmada	Inta goor	Cadadka (xaddiga) (Markey ku haboon tahay )
1=Zako ka timaado qoysaska ladan		
2=Xawaalad dibadda ka timaadda		
3=Xawaalad ka timaadda wadanka gudahiisa		
4=Deeq		
5=Amaah		
9=Wax kale, _____		

**Q52** Kaalmo rasmi ah oo caalami ah ama waddaniyadeed 3dii bilood ee u dambeeyey 1= Haa 2= Maya

**Q52a** Caddadka iyi inta goor mid walba.

Nooca Kaalmada	Inta goor	Cadadka (Xaddiga)
1= Lacag bilaash aad ku heshay		
2=Cunto bilaash lagugu siiyey		
3=Lacag aad shaqo ku badalatey (Cash for work)		
4=Cunto aad shaqo ku badalatey (food for work)		
5=Cunto kabiid ahaan lagu siiyey (suppl.Food)		
6=Biyo lagu siiyey kabiid ahaan (subsidy water)		
7= xoolo lagu siiyey gaadiid ceshi		
8=Kaalmo xanaanada xoolaha (veterinaty) aad heshay		
9=Kale, caddee _____		

## Appendix 4: Sool Plateau Mortality Questionnaire Set

### Qaabka Su'aalaha Qoyska ee Foomka dhimashada.

Date \_\_\_\_\_ Team Number \_\_\_\_\_ Cluster Number \_\_\_\_\_  
 Tariikh \_\_\_\_\_ Numbarka koxda \_\_\_\_\_ Kalaster Numbar \_\_\_\_\_  
 Name of Interviewer \_\_\_\_\_ Name of Village/Town \_\_\_\_\_  
 Magaca waydiiyaha \_\_\_\_\_ Magaca Tuulada/magallo \_\_\_\_\_  
 Name of section \_\_\_\_\_ Household Number \_\_\_\_\_  
 Magaca Qaybta \_\_\_\_\_ Nambarka Gurga \_\_\_\_\_  
 Name of the household head \_\_\_\_\_ Mgaca madaxa Qoyska \_\_\_\_\_

<b>MORTALITY MODULE (SU'ALLAHA DHIMASHADA.</b>	
CHILD: <i>(This questionnaire should be preferably administered to all women in the household)</i>	
1. Have you ever given birth? Weligaa ilma ma dhashay. <i>(Birth- a child who ever breathed or cried or showed signs of live even if he/she lived only a few minutes or hours)</i> <i>Ilma nool oo neefsanaya markuu dhasho oo leh callmadihii nololed.</i>	Yes..... Haa No..... Maya
2. Have you any live birth between the <b>2<sup>nd</sup> March 04</b> and now? Miyaad dhashay ilma nool intii u dhaxaysay <b>2<sup>nd</sup> Bishii March 04</b> iyo hadeertada aynu joogno.	Yes..... No..... Haa.....Maya If yes, how many?... Haddii ay haa tahay waa imisa?.....
3. Have you any under five child other than your own in your household coming in since the. <b>2<sup>ND</sup> March 04</b> <b>Miyey jiraan wax carruur ah shan sano ka yar oo aadan dhalin oo idiin yimi ilaa. 2<sup>ND</sup> March 04</b>	Yes..... No..... Haa.....Maya If yes, how many?..... Haddii ay haa tahatay waa imisa.....
4. How many under 5yrs children were living in this household as on the <b>2<sup>ND</sup> March 04</b> 5. Imisa carruura oo shan sano ka yar ayaa gurigan ku nool illaa <b>2<sup>ND</sup> March 04</b>	Number..... Tirada.....
6. How many Under 5yrs children live with you now? Imisa carruur shan sano ka yar ayaa hadda ku nool guriga.	Sons at home..... Imasa wiilal ah Daughters at home ..... Imisaa gabdh ah
7. Do you have any Under 5yrs child who has died since the <b>2<sup>nd</sup> March 04</b> ? 8. <b>Imisa wax carruur shan sano ka yar ayaa kaa dhintay ilaa 2<sup>nd</sup> March 04?</b>	Yes.....No.....If yes, then Sons dead ..... Haa.....Maya.....haday jirti imisa wiil.. ama gabdhood baa dhintay..... Daughters dead.....
9. If there has been death of an Under 5yrs child in this household, then what were the signs and symptoms of death?/suspected cause of death? Miyuu jiraa ilmo shan sano kar oo ka dhintay gurigan, muxuuse ahaa calamadaha ama waxa aad umalaynaysid inuu u dhintay.	Child1..... Ilmaha kowaad..... Child2..... Ilmaha Labaad..... Child3..... Ilmahasadexaad..... Child4 .....
<b>ABOVE FIVE YEARS OLD IN THE HOUSEHOLD( Inta ka weyn shan sanadood ee Gurigaan)</b>	

<p><b>10.</b> How many above five years old were living in this household as on the <b>2<sup>nd</sup> March 04?</b></p> <p><b>11. Imisa qof oo shan sano ka weyn ayaa gurigan ku noolaa ilaa 2<sup>nd</sup> March 04?</b></p> <p><i>(List the names somewhere separate and account for everybody as per the questions below)</i> <b>Ku qor magacyada meel gaara ee dadkan</b></p>	<p>Number &gt;5yrs.....</p> <p>Tirada shan sano ka yar.....</p>
<p><b>12.</b> How many above 5 yrs live in this household now? Imisa qof oo shan sano ka weyn ayaa ku nool gurigiina imika?</p>	<p>Number.....</p> <p>Tirada.....</p>
<p><b>13.</b> Do you have any over 5 years old person in this household who has died since the <b>2<sup>nd</sup> March 04?</b></p> <p><b>14. 14 Miyuu jiraa qof shan sano ka weyn oo gurigan ah oo dhintay ilaa 2<sup>nd</sup> March 04?</b></p>	<p>Yes.... No.....</p> <p>Haa.....Maya.....haday jirti imisaa ka yar shansano.....</p> <p>If yes, no. &gt;5yrs.....</p>
<p><b>15.</b> If there has been death of &gt;5yrs person in this household, then what were the signs and symptoms of death?</p> <p>Haddii uu jiro qof ka weyn shan sano oo dhintay, maxay ahaayeen calamadihii iyo sababtii uu u dhintay, imisa qofbaa se dhintay?</p>	<p>Peron1.....</p> <p>Ilmaha 1aad.....</p> <p>Person2.....</p> <p>Ilmaha 2aad.....</p> <p>Person3.....</p> <p>Ilmaha 3aad.....</p> <p>Person4 .....</p> <p>Ilmaha 4aad.....</p>

**Appendix 5: Traditional Calendar of Events**

Month	1999	2000	2001	2002	2003	2004
Jan		54 (sidatal)	42 (sidatal)	30 (sidatal)	18 (sidatal)	6 (sidatal)
Feb		53 (Arafo) <b>XAJ</b>	41 (Arafo) <b>XAJ</b>	29 (Arafo) <b>XAJ</b>	17 (Arafo) <b>XAJ</b>	5(Arafo)
March		52 (Dago)	40 (Dago)	28(Dago)	16(Dago) <b>Dagalkii Ciraq</b>	4 (Dago)
Apr		51 (Safar)	39 (Safar)	27 (Safar)	15 (Safar) <b>Doorashadii Madaxweyn aha</b>	3 (Safar)
May		50 (Mawliid)	38 (Mawliid)	26 (Mawliid)	14 (Mawliid)	2 (Mawliid)
Jun		49 (Rajal- hore)	37 (Rajal- hore)	25 (Rajal- hore)	13 (Rajal- hore)	1
Jul		48 (Rajal dhexe)	36 (Rajal dhexe)	24 (Rajal dhexe)	12 (Rajal dhexe)	
Aug	59 (Rajal dame)	47 (Rajal dame)	35 (Rajal dame)	23 (Rajal dame)	11 (Rajal dame)	
Sep	58 (Sabuux)	46 (Sabuux)	34 (Sabuux) <b>Qaraxyadii Maraykanka</b>	22 (Sabuux)	10 (Sabuux)	
Oct	57 (Soon- eri)	45 (Soon- eri)	33 (Soon- eri)	21 (Soon- eri)	9 (Soon-eri)	
Nov	56 (Soon)	44 (Soon)	32 (Soon)	20 (Soon)	8 (Soon)	
Dec	55(Sonfu r)	43 (Sonfur)	31 (Sonfur)	19 (Sonfur)	7 (Sonfur)	

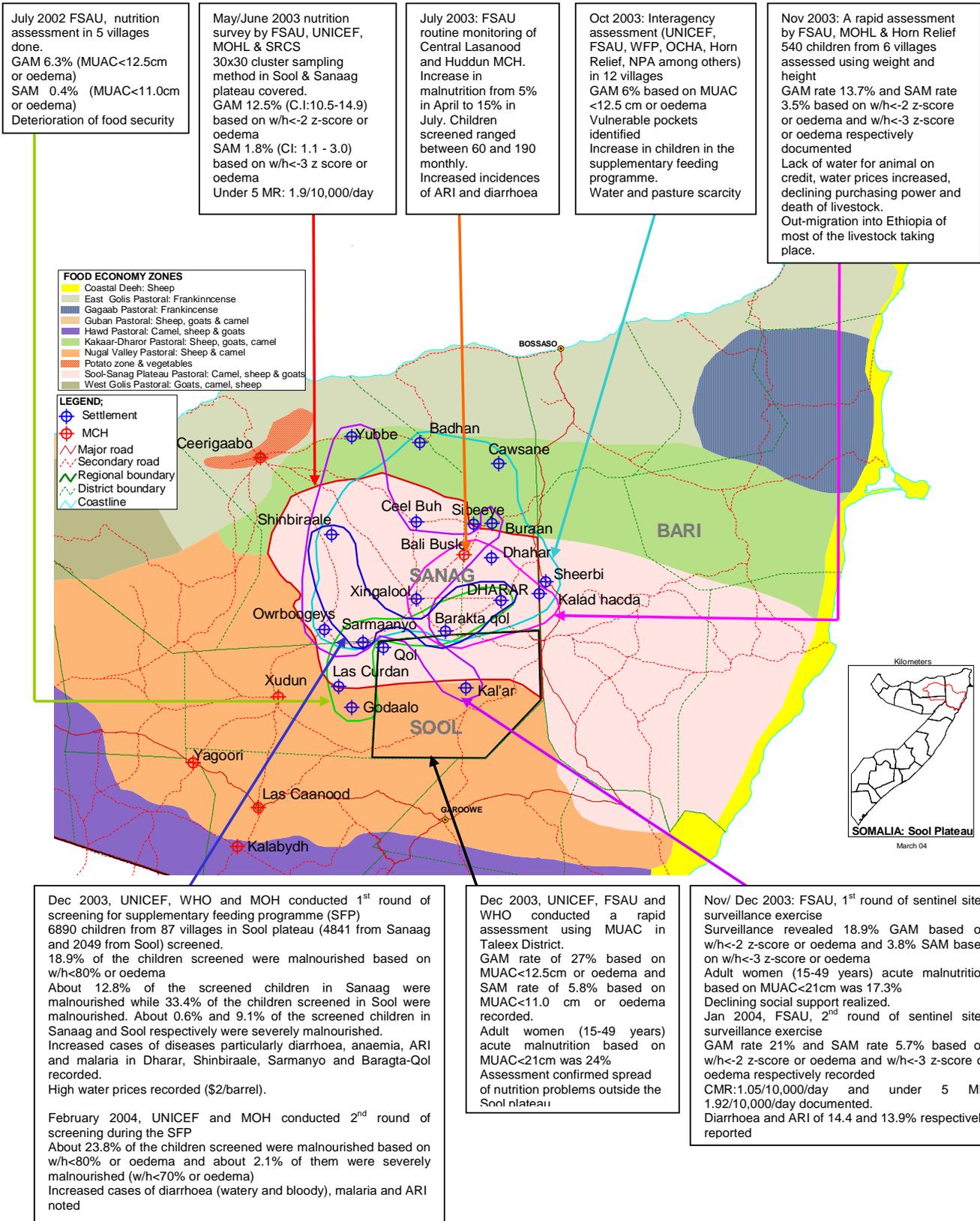
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## Appendix 6: Summary of Past Nutrition Information on Sool Plateau of Sool and Sanaag Regions



**Appendix 7: Prevalence of chronic malnutrition based on height for age Z-score**

	<i>Males</i>		<i>Females</i>		<i>Total</i>	
	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>
Global chronic malnutrition (H/A<-2 z score)	13.0 (CI: 10-16.5)	57	21.2 (CI: 17.5-25.2)	98	17.2 (CI: 14.8-19.8)	155
Severe chronic malnutrition (H/A<-3 z score)	5.5 (CI: 3.5-8.0)	24	6.5 (CI: 4.4-9.1)	30	6.0 (CI: 4.5-7.7)	54

The prevalence of chronic malnutrition defined as height for age <-2 Z score was 17.2% (CI: 14.8-19.8) and severe chronic malnutrition, defined as height for age <-3 Z score, was 6.0% (CI: 4.5-7.7)

**Appendix 8: Prevalence of underweight based on weight for age Z-score**

	<i>Males</i>		<i>Females</i>		<i>Total</i>	
	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>	<i>%</i>	<i>No</i>
Underweight malnutrition (W/A<-2 z score)	14.4 (CI: 11.2-18.0)	63	29.4 (CI: 25.3-33.7)	136	22.1 (CI: 19.4-25)	199
Severe underweight malnutrition (W/A<-3 z score)	2.0 (CI: 0.9-3.8)	9	7.5 (CI: 5.3-10.3)	35	4.9 (CI: 3.6-6.5)	44

The prevalence of underweight malnutrition defined as weight for age <-2 Z score was 22.1% (CI: 19.4-25) while the prevalence of severe underweight malnutrition, defined as weight for age <-3 Z score, was 4.9% (CI: 3.6-6.5).

**Appendix 9: Survey Teams**

<i>Team Number</i>	<i>Enumerators</i>	<i>Supervisors</i>	<i>Clusters</i>
1	Hassan Haire Hafsa Ahmed	Asha Aden	CeelaWeyn-17,18,19, DanWayn -20 Kurxero -13
2	Mohamed Salah Fuadumo Awaad	Khalif Nur	Dhahar-25,26 Balibuule- 27 Mayagaag-28; Ceelbuh-29
3	Hussein Abdulahi Shukri Mohamed	Fuaad Hassan	SufurWayne-6 Bohol-12; Xaaboderi-7 Ardaa – 14; Gelisle-10
4	Shamis Mohamed Ali Hassan	OsmanWarsame Saado	Awrboagays-1,2 Sarmaanyo-3,4 Quindhiele-5
5	Fardus Yusuf Siad Ahmed	Nura Gureh Ahmed Jamma	Ceeryan-8; DararWeyne-11 Laymadh-15; Shidalale-30 Caamayulug-16
6	Sahara Deegawein Mohammed Farah	Hassan Suad	Fiqiga-9; Shimbaraale- 21 Xungalaoh-22,23 Baraagtaqoh -24

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