NUTRITION ASSESSMENT

ALLULA KANDALA & ISKUSHUBAN DISTRICTS BARI REGION, NORTH EAST ZONE SOMALIA.

Food Security Analysis Unit (FSAU/FAO)
United Nations Children's Fund (UNICEF)
Ministry of Health (MOH), Puntland
Somali Red Crescent Society (SRCS)

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FSAU

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Abbreviations and acronyms

ARI	Acute Respiratory Infections
CSI	Coping Strategy Index
FAO	Food and Agriculture Organisation
FSAU	Food Security Analysis Unit
GAM	Global Acute Malnutrition
GIT	Gastrointestinal Tract
HAZ	Height- for- Age Z scores
HDDS	Household Dietary Diversity Score
HFA	Height for Age
IDA	Iron Deficiency Anaemia
IDP	Internally Displaced Person
KM	Kilo Metres
MCH	Maternal and Child Health
MT	Metric Tonnes
MUAC	Mid Upper Arm Circumference
NCHS	National Centre for Health Statistics
NGOs	Non-Governmental Organisations
NRC	Norwegian Refugee Council
PWA	Post War Average
LEZ	Livelihood Economic Zones
LNGO	Local Non-Governmental Organisation
INGO	International Non-Governmental Organisation
NIDs	National Immunisation Days
OR	Odds Ratio
RR	Relative Risk
SACB	Somalia Aid Coordination Body
SMART	Standardised Monitoring & Assessment of Relief and Transitions
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission of Refugees
VAD	Vitamin A Deficiency
UNICEF	United Nations Children's Fund
WAZ	Weight for Age Z Scores
WFP	World Food Programme
WHO	World Health Organisation
WHZ	Weight for Height Z scores

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EXECUTIVE SUMMARY

Bari, the largest region in Puntland state of Somalia is made up of six major administrative districts which include the assessment areas of Allula, Kandala and Iskushuban. The three districts have a total population of about 87,110 persons (WHO NID July 2006). The assessment area has 4 main ecological zones[1]. In Allula, Kandala and Iskushuban districts, the majority who are pastoralists rely on food purchases, which account for 60-80% of their annual food needs in an average year. Livestock products (meat and milk) from the herd make up the bulk of remaining food basket. Income is derived mainly from sales of livestock and livestock products, even though fishing and sale of frankincense normally provide a substantial proportion of the income. Parts of the area in Allula, Kandala and Iskushuban districts, which were identified with an early warning level of 'watch' in the post-deyr 05/06 (FSAU, June 2006) analysis are considered to be in Acute Food and Livelihood Crisis (FSAU, September 2006). A decline in income during the last fishing season (October '05 to April '06) and from frankincense production had contributed to an overall decline in food and livelihood security status in these areas (FSAU Post *Gu* Analysis, 2006). By the time of this assessment, the deyr rains had started and the situation was expected to improve.

Between 14th and 27th September 2006, a joint nutrition assessment using a 2- stage cluster sampling methodology, was conducted by FSAU, UNICEF, MOH, SRCS, AID and CAS among **919** (927 less 8 flags) children aged 6-59 months sampled from **501** (506 less 5) households. Concurrent mortality survey was conducted in 907 households. The aim of the survey was to determine the nutrition status of children between 6-59 months or 65-109.9 cm using weight for height index and to establish underlying causes of malnutrition. Data quality was ensured by close supervision, review and control during data collection, entry and analysis (in EPI info, Excel and SPSS).

Table 1: Summary of findings

Indicator	No	%	95% CI
Total number of households surveyed	501	100	
Mean household size		5.4	(SD=2.2)
Mean number of children less than five years per household		1.9	(SD=0.9)
Total number of children assessed	919	100	
Global Acute Malnutrition (WHZ<-2 or oedema)	127	13.8	11.0 – 16.6
Severe Acute Malnutrition (WHZ<-3 or oedema)	15	1.6	0.9 – 2.4
Oedema	2	0.2	0.0 – 0.5
Global Acute Malnutrition (WHM<80% or oedema)	74	8.1	6.4 – 10.1
Severe Acute Malnutrition (WHM<70% or oedema)	6	0.7	0.3 – 1.5
Proportion of malnourished women (MUAC≤18.5; N=421).	8	1.5	0.7 - 2.7
Proportion of severely malnourished women (MUAC≤16.0; N=421)	2	0.4	0.1 – 1.5
Proportion of malnourished pregnant women (MUAC≤23.0; N=103)	146	27.9	24.1 – 32.0
Proportion of severely malnourished pregnant women (MUAC≤20.7)	49	9.4	7.1 – 12.3
Children reported to have diarrhoea in 2 weeks prior to assessment	258	28.1	21.2 – 35.0
Children reported to have ARI within two weeks prior to assessment	236	25.7	18.8 – 32.5
Children with suspected malaria in 2 weeks prior to assessment	181	19.7	17.2 – 22.4
Suspected measles within one month prior to assessment (N=852)	25	2.9	1.3 – 4.6
Children (9-59 months) immunised against measles in last 6 months (N=852)	250	29.3	19.2 – 39.4
Children who have ever received polio vaccine (N=919) in last 6 months	771	83.9	77.5 – 90.3
Children who received vitamin A supplementation in last 6 months	441	48.0	37.3 – 58.6
Proportion of households who consumed ≤3 food groups	36	7.2	5.2 – 9.9
Proportion of households who consumed ≥4 food groups	465	92.8	90.1 – 94.8
Proportion of children 6-24 months who are breastfeeding (N=287)	128	44.6	38.8 – 50.6
Proportion of children introduced to other foods before 4 months	198	69.0	63.3 – 74.3
Under five Death Rate (U5DR) as deaths/10,000/ day		0.99	0.26 - 1.73
Crude Death Rate (CDR) as deaths/10,000/ day		0.38	0.18 - 0.59

[1] Coastal Deeh, East Golis Pastoral – Frankinncense, Gagaab pastoral – Frankinncense and Kakar-Dharor pastoral.

The assessment results indicate a Global Acute Malnutrition (WHZ<-2 or oedema) of **13.8%** (CI: 11.0 -16.6) and a Severe Acute Malnutrition of **1.6%** (CI: 0.9- 2.4), slightly higher rates compared to the rate reported in the last nutrition assessment conducted four years earlier. Using weight for height percent of median indices, the global acute malnutrition (WHM<80%) was 8.1% (CI: 6.4 – 10.1) and severe acute malnutrition (WHM<70%) was 0.7% (CI: 0.3 – 1.5). These results indicate a serious nutrition situation according to WHO classification. The assessment results are however, consistent with the long term estimates of global acute malnutrition (10 – 14.9%) typical for this area. The last assessment of September 2002 found similar levels with a GAM of 12.6% (CI: 10.6 – 14.9) and the current findings confirm a persistently poor nutrition situation for the region. This situation could be explained by inadequate food intake due to food, water and pasture shortages resulting from poor rainfall outcome from the previous seasons (*Deyr/heys* '05 and *Gu* '06) in addition to high morbidity levels. Poor child feeding practices remain significant underlying causes of malnutrition.

The retrospective crude and under five mortality rates were **0.38** (CI: 0.18 -0.59) and **0.99** (CI: 0.26 – 1.73) deaths/10,000/day respectively and indicate acceptable levels according to WHO classification. Malaria, hypo-endemic in this area and poor reproductive health like birth complications were the common causes of death among children. Maternal care services are lacking as there are no functional health facilities in the area of assessment.

Water quality and sanitation were poor with 70.5% drawing water from unprotected sources and 63.5% using bush for disposal of human waste. Overall, almost one-half (47.7%) of the assessed children had suffered from one or more communicable childhood diseases during the two weeks prior to the assessment. About 93% of the households had consumed 4 or more food groups reflecting a significant dietary diversity for the community. Very few children (12.2%) were timely introduced to complementary foods at the recommended age of six months. Health programmes coverage in the districts was generally low especially for measles immunization (29.3%) and vitamin A supplementation (48%). Access to medical services was limited by lack of operational health facilities in the assessment areas.

Malnutrition was significantly associated with morbidity as it was higher among those who had been ill ($p=0.01$)[2]. Children who fell ill were 1.5 times more likely to be malnourished than those who were well two weeks prior to assessment ($1.1 \leq RR=1.53 \leq 2.13$)[3]. In particular, ARI had a significant association with malnutrition ($p=0.04$).

Following discussions held after sharing the results with partners and detailed data analysis, both short- and long-term recommendations were made:

Short term recommendations

1. Enhance delivery of basic health services including intensifying EPI services and setting up cold chain facilities at the district MCH
2. Rehabilitation and treatment of severely and moderately malnourished children
3. Rehabilitation and protection of water points, water treatment and provision
4. Intensify health education.

Long-term Recommendations

1. Support by agencies to re-establish and re-open health posts and centres that already exist but are not operational and to establish others in areas where there are no health facilities at all like Kandala and Iskushuban.
2. Conduct a Knowledge, Attitude and practice (KAP) survey to understand the level of maternal knowledge and practices related to child nutrition and feeding practices

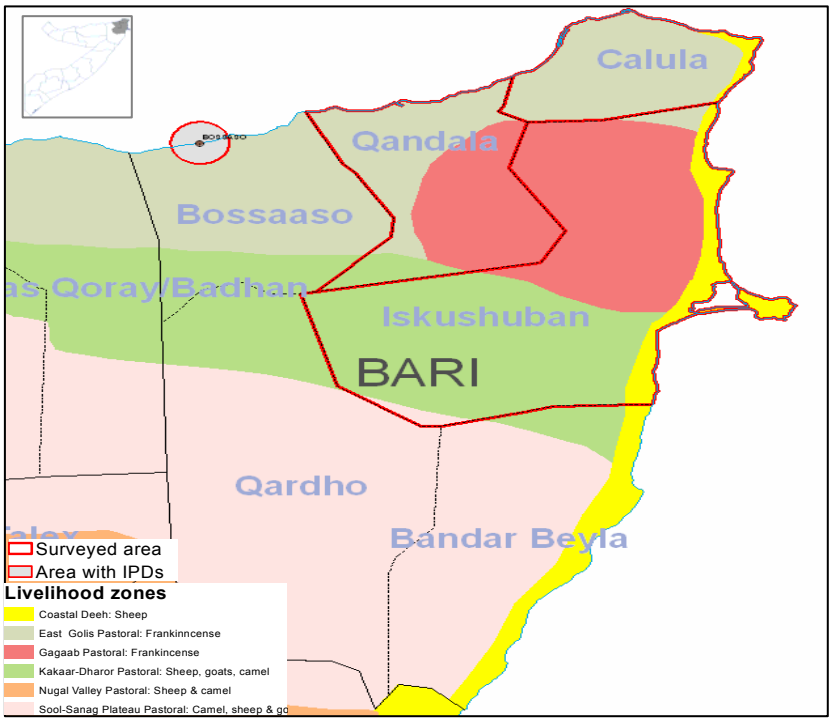
[2] p corresponds to the statistical significance test. It is the probability that an event occurs.
[3] The risk ratio (RR) corresponds to the added risk of malnutrition. The further the RR from 1.0, the greater the association.

3. Enhance nutrition and health education programmes with a specific focus on good sanitation; hygiene and child feeding practices.
4. Capacity building of local health staff to enhance management of acute malnutrition at community and MCH levels.

1.0 INTRODUCTION

1.1 Overview

The nutrition assessment was undertaken in three districts of Allula, Kandala and Iskushuban (including Bargal and Hafun) in Bari region. Bari is the largest region in Puntland State of Somalia. The region is made up of 6 main districts namely Bossaso, Gardo, Bander-Beila, Iskushuban (including Hafun and Bargal), Kandala and Allula. Allula, Kandala and Iskushuban districts in Bari region have a total population of about 87,110 persons (WHO NID July 2006 figures, further verified by the assessment team). As reflected on the map, Fig 1), the assessment area has 4 main ecological zones: Coastal Deeh, East Golis Pastoral – Frankincense, Gagaab pastoral – Frankincense and Kakar-Dharor pastoral.



The main rainy seasons are Gu (April-June) and Deyr (mid September-November). In addition, the coastal areas receive Xays/Wajine rains between December and mid January. The average annual rainfall is less than 100 mm.

Pastoralism is the main livelihood system, with substantial contribution from frankincense and fishing. The area is very remote, with poor infrastructure limiting access to health services, income opportunities and utilization of resources.

1.2 Survey Justification

Allula, Kandala and Iskushuban districts of Bari region have been vulnerable to natural disasters like droughts and tsunami related stress. Nutrition surveillance information has often depicted serious levels of malnutrition in the area. The last nutrition assessment conducted in these districts (UNICEF/FSAU and partners) in September 2002 reported a serious (WHO Classification) level of malnutrition with global acute malnutrition of **12.6%** (CI: 10.6 – 14.9%) and severe acute malnutrition of **2.1%** (CI: 1.3 – 3.3). The FSAU post *Gu* 2006 analysis and projections classified this area, which was identified with an early warning level of watch in the post *Deyr* 2005/6 analysis, to be in an acute food and livelihood crisis. Thus between 14th and 27th September 2006, a joint nutrition assessment, using a 2- stage (30 X 30) cluster sampling methodology, was conducted by FSAU, UNICEF, MOH, SRCS, AID and CAS among **919** children aged 6-59 months sampled from **501** households. This assessment served to follow-up and to evaluate the food security and nutrition situation among the population. The aim of the survey was to determine the nutrition status of children between 6-59 months or 65-110 cm using weight-for-height index. The survey also sought to establish underlying factors influencing the nutrition status and to provide recommendations for interventions based on the findings.

1.3 Objectives of the study

1. To estimate the prevalence of acute malnutrition and nutritional oedema among children aged 6-59 months or with height/length of 65-109.5 cm.
2. To estimate the level of malnutrition among adult women aged 15-49 years in the area of assessment
3. To identify underlying causes of malnutrition in young children in the area of assessment
4. To estimate the prevalence of some common diseases (measles, diarrhoea, malaria, and ARI) in the area of assessment
5. To estimate the dietary diversity status of the population in Allula, Kandala and Iskushuban districts
6. To estimate measles and polio vaccination and Vitamin A supplementation coverage among children in the area of assessment
7. To estimate the crude and under-five mortality rates in the area of assessment

2.0 BACKGROUND INFORMATION:

2.1 General overview

There has been general recovery in pastoral livelihoods over the last four seasons in Bari region. Parts of the area in Allula, Kandala and Iskushuban districts, which were identified with an early warning level of 'watch' in the post-deyr 05/06 (FSAU, June 2006) analysis are now considered to be in Acute Food and Livelihood Crisis (FSAU, September 2006). In areas that received below normal *Gu* '06 like agro-pastoral parts of Allula, Kandala and Iskushuban, water and pasture availability has been poor. Increased livestock off-take and debt levels were reported in these areas to cover water-trucking costs during *jilaal* season (January to March). A decline in income during the last fishing season (October '05 to April '06) and from frankincense production had contributed to an overall decline in food and livelihood security status in these areas (FSAU Post *Gu* Analysis, 2006). By the time of this assessment, the deyr rains had started and the situation is expected to improve.

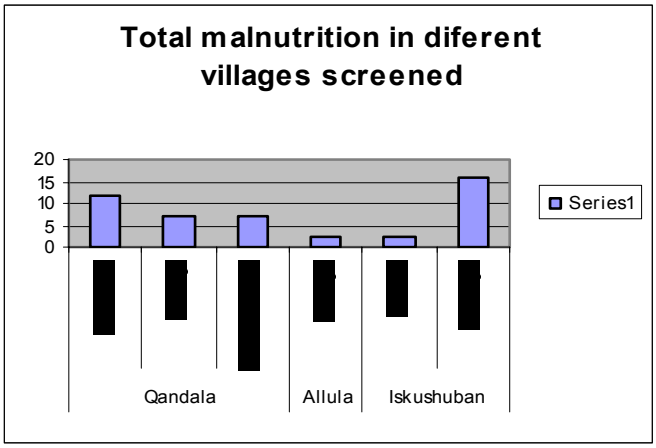
2.2 Humanitarian Interventions

Humanitarian activities are currently minimal in this area. UNICEF has since 1996 been involved in rehabilitation, establishment and support of water systems, besides providing basic health care kits to health centre/posts in the area. Several shallow wells, water pipes and water storage tanks were rehabilitated/ constructed in the project in Allula, Bargal and Iskushuban towns. Aktion Afrika Hilfe (AAH) has been running PHC projects in Iskushuban (also in Gardo and Bender-Beilla) since 1997.

2.3 Nutrition

The long-term trends in malnutrition rates from FSAU nutrition surveillance system (1999 -2005) depict serious malnutrition levels (GAM of 10 – 14.9%) in Allula, Kandala and Iskushuban. The last nutrition assessment conducted in these districts (UNICEF/FSAU and partners) in September 2002 reported a serious (WHO Classification) level of malnutrition with global acute malnutrition of 12.6% (CI: 10.6 – 14.9%) and severe acute malnutrition of 2.1% (CI: 1.3 – 3.3). Morbidity (especially diarrhea and suspected malaria) was the main factor associated with malnutrition.

In July 2006, FSAU conducted an exhaustive nutrition assessment in five villages among 243 children in Kandala, Allula and Iskushuban districts, within the livelihood zones of Golis, Gagaab and Coastal deeh to assess the nutrition situation. Analysis of findings in the five villages (Mudiye, Ceelgaal, Xarrago, Beelwacatay and Bargal) indicated acceptable levels (WHO) of acute malnutrition ranging from 2.3% - 4.8% and high incidences of communicable diseases (ARI, diarrhoea and malaria) ranging from 16% (in Bargal) to 33% (in Xarrago village). Whooping cough was reported in Harago, Beeli-wacatay, Ceel-gaal and Mudiye villages. Apart from whooping cough, no other disease outbreak was reported in recent months.



2.4 Water and Environmental Sanitation

Water shortage is a major problem for both the people and livestock, becoming more acute during the *jilaal* season (January-March) of a bad year. In the normal year the wealthier population provides water to the poor free of charge except during the *Jilaal* when water prices are very high. Since October 2005, there has been an acute water shortage in certain areas like

Mudiye exacerbated by below normal *Gu* rains in the area, where the price of one barrel of water reached 70,000 Somali Shillings (So. Sh), an equivalent of about 5 USD. The major source of water in the other villages is unprotected berkads which dried out and water trucking became a significant source. Increased spending on water trucking during *jilaal* season was a significant problem for pastoralists in areas where rains were poor in *deyr/heys* '05/06 and *Gu* '06 (FSAU Post Gu Analysis, Sep 2006).

Environmental sanitation is also generally poor in the areas. Besides water rehabilitation programmes, UNICEF has in the past provided school sanitation facilities in Allula, Kandala and Iskushuban.

2.5 Health issues

MOH with the support from UNICEF-Bossasso supports a system of healthcare provision through MCHs and health posts. There is only one functional MCH in Allula, one in Bargal and two in Iskushuban district. There are five health posts in Allula and 3 health posts in Kandala all of which are not operational. Only the two public health facilities in Iskushuban managed by SRCS are operational. The other health posts that do not operate regularly. In most of these villages the public health services are very low, for example there are villages in Allula and Kandala district without a single operational health facility.

Regarding morbidities, there has been no reported outbreak of diseases in recent months; however, many cases of whooping cough were seen in villages of Harago, Beeli-wacatay, Ceel-gaal and Mudiye during an assessment conducted by FSAU in 5 five villages in July 2006. The other common diseases, reported through focus group discussions in all the villages were ARI, Diarrhoea and Malaria.

2.6 Food security

In Allula, Kandala and Iskushuban districts, the majority of the populations, who are pastoralists, rely on food purchases, which account for 60-80% of their annual food needs in an average year. Livestock products (meat and milk) from the herd make up the bulk of remaining food basket. Income is derived mainly from livestock and livestock product sales, even though fishing and sale of frankincense provide a substantial proportion of the income. Generally, livestock body conditions were reported to be average to good during the *Gu* assessment with normal conception and reproduction rates, hence normal milk and ghee production. Livestock holdings were reported to have increased by 5-10% between April '05 and March '06. During the same period camel holdings increased even more, by 30-40%. There was however, a decline from income derived from the last fishing season (October '05 to April '06) and from frankincense production (FSAU Post Gu Analysis, 2006).

Terms of trade for pastoralists are generally high with an increasing trend over the past two years of pastoral recovery. The terms of trade between export-quality goats and imported red rice fluctuated between January and July 2006 in response to the seasonality of the peak export season, but by July '06 were still 21% higher than they were the same period the previous year. The terms of trade between rice and labour for the poor also increased slightly (by 2%) in Bari region.

3.0 METHODOLOGY

3.1 Assessment design

This was a cross-sectional study among the populations in Allula, Kandala and Iskushuban districts in which both qualitative and quantitative techniques were used. Quantitative data was collected through a standard household questionnaire for nutrition (see appendix 2). Retrospective mortality data for 90 days prior to the assessment was also collected among the study households (see appendix 3). Qualitative data was collected from key informants by assessment supervisors through focus group discussions and key interviews to provide further understanding of possible factors influencing malnutrition.

3.2 Sampling procedure

Using a two-stage cluster sampling methodology, 30 clusters were randomly selected based on population proportion to size. Initially a sampling frame was constructed from which a representative sample could be drawn. A list of all villages within the Allula, Kandala and Iskushban districts with their respective populations was used to construct cumulative population figures for the assessment area. Using WHO Polio population figures, generated during National Immunization Days (WHO, July 2006) and the input of key informants from the region, all settlements/villages were listed in the sampling frame and their population estimates further verified for authenticity by the assessment team. An estimated population of 87,110 from all settlements/villages was obtained from which 30 clusters were selected. Using the Nutrisurvey software a random number (1394) was chosen to determine the first cluster. The subsequent clusters were determined systematically by adding the cluster interval (2904) to the first randomly selected number (see appendix 1). From the 30 randomly selected clusters, a total of 919 children (927 less 8 flags) aged 6-59 months and/or height/length of 65-109.9 cm from 501 (506 less 5) households were surveyed.

In each of the clusters, mortality questionnaires were administered to 30 randomly selected households. The same sampling frame used for nutrition assessment was employed in cluster selection for the mortality assessment. In total, mortality data was collected from 905 households irrespective of whether or not the household had a child under-five.

Study population and sampling criteria

The study population consisted of people living in the districts of Allula, Kandala and Iskushuban of Bari region and comprised all the children aged 6-59 months or measuring 65-109.9 cm in height/length. The sampling procedure as outlined in the guidelines endorsed by the Nutrition Working Group of Somalia Support Secretariat (SSS) and that is compliant with SMART Guidelines, was followed in this assessment. On the visit to each cluster, the centre was identified and a pen was spun to determine the direction to follow in moving to the edge of the cluster. On reaching the edge of a cluster, a pen was spun a second round, until the pen pointed inward the cluster/village to determine the direction to follow in the systematic selection of the households with children aged 6 to 59 months. The households in this direction were counted / established as the team crossed to the other edge and given numbers. A random number within the total number of households encountered was drawn to enable random selection of the first household to be visited. From the first household, the team always moved to the right direction to the next household. This procedure was followed until the required 30 children were obtained in a cluster.

All sampled households were visited, the supervisor noting whether it was empty and whether children in the target age group were present or not. In households without children in the target age group only the mortality questionnaires were administered. If a cluster was exhausted of

children before the required 30 children had been reached, a neighbouring area with similar characteristics was selected to complete the cluster. All eligible children in the households were measured and if a child or primary caregiver was absent, an appointment was booked for a later visit in the course of the assessment.

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. It was ensured that this procedure was adhered to. 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, shouted loudly and the average recorded on the questionnaire.

Height: For height, a vertical or horizontal measuring board reading a maximum of 130 cm and accurate 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, pressing 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.

Arm Circumference: The Mid Upper Arm Circumference was measured using a MUAC tape to the nearest 0.1 cm. Two readings were taken and the average recorded for each child.

3.3.2 Child age determination

Where useful documents like growth monitoring/clinic attendance cards and birth certificates were available, they were used to determine the child's age. A calendar of events (appendix 4) was also used to estimate the age of the child. Though not entirely accurate, ages were still regarded as important indicators and were approximate/average pointers for identification.

3.3.3 Oedema

Oedema, defined as bilateral oedema on the lower limbs was assessed by gently pressing the feet to check if a depression is left after at least three seconds. It was confirmed, if present, by the supervisor and then recorded.

3.3.4 Morbidity

Morbidity pattern was assessed by asking about incidences of common communicable diseases i.e. diarrhoea, acute respiratory infection, suspected malaria/ febrile illness and measles in the two weeks prior to the assessment.

Diarrhoea: Diarrhoea was defined as 'three or more loose or watery stools per day'.

Measles: Defined as 'more than three signs of the following: 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.* Defined as 'cough, rapid breathing and fever'.

Suspected malaria/acute febrile illness: Defined as 'periodic chills, fever, sweating or coma.

3.3.5 Mortality

The mortality assessment was done concurrently with nutrition assessment in which a 30 by 30 cluster sampling methodology was used. The assessment methodology used for the nutrition assessment was adopted with the exception that households were selected as the final sampling unit. At least 30 households were randomly selected in each cluster and the mortality questionnaire (appendix 3) administered to a responsible member of that household. All households within the selected cluster were eligible for inclusion in the mortality assessment, whether there was a child under the age of five or not. Households were systematically surveyed until the 30th 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, left or arrived in the last three months. A total of 907 households were included in the assessment.

The crude and undefive mortality rates were generated automatically by the Nutrisurvey software as deaths per 10,000 persons per day using a recall period of 90 days. If a household member had died, the respondent was asked to describe the cause or signs and symptoms of the illness likely to have caused the death and these were recorded.

Mortality rates can be interpreted according to the following reference (WHO)

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

3.3.6 Dietary Diversity

Dietary diversity (when households consume four or more food groups) was determined by taking a simple count of various food groups consumed in a given household over the past twenty four hours. A total of 12 FAO recommended food groups were considered which included Cereals & cereal products; Roots & tubers; Vegetables; Fruits; Meat and meat products, Eggs; Fish; Legumes; Milk & its products; Fats & oil; Sugar & honey and Miscellaneous.

3.3.7 Vitamin A Deficiency

During the assessment, Vitamin A deficiency (VAD) prevalence was estimated by assessing if any member(s) of the households experienced night blindness.

3.4 Description of assessment activities

Six teams each consisting of two enumerators; one team leader and one supervisor conducted the assessment with each team handling one cluster in a day. An elder from each village/cluster assisted the teams in ground identification of the cluster and introduction to the community, its centre and boundaries. Team leaders and Supervisors were seconded from the participating partners namely; FSAU, Ministry of Health, SRCS, AID and CAS. Overall support, supervision and co-ordination were done by two FSAU Senior Nutritionists who also assisted in the identification of the qualified supervisors. The enumerators, team leaders and supervisors were selected on the basis of their experience with previous assessments, need for participation in future nutrition activities and ability to learn nutrition assessment procedures during training.

Table 2: Chronology of activities for the Allula, Kandala and Iskushban Nutrition Assessment

Major Activity	Dates. 2006
Preparation of tools, methodology & review of secondary data (Nairobi) Resource mobilization; Joint planning meetings with partners	20th – 30th May
Training of enumerators, pre-testing questionnaire and cluster Identification	14th - 17th Sep
Collection of data	19th – 27th Sep
Entry of data	27th Sep – 6th Oct
Data cleaning and analysis	9th – 13th October
Presentation of preliminary results to partners	30th October
Circulation of draft report	7th November
Circulation of final report	16th November

3.5 Quality Control Procedures

A comprehensive training of enumerators and supervisors was conducted covering interviewing techniques, sampling procedure, inclusion and exclusion criteria, sources and reduction of errors, taking of measurements, standardisation of questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema and measles, verification of deaths within households, handling of equipment, and the general courtesy during the assessment.

Standardisation of measurement and pre-testing of the questionnaire and equipment was carried out in Xaafatul Arab and Raxiis (two villages in the outskirts of Bossasso town) which were not selected clusters for the actual assessment. Pre-testing involved familiarising assessment teams with village/cluster entry; administering the questionnaire, sampling procedure, correct taking of measurements and recording. After the field exercise, views were exchanged to address the difficulties identified; appropriateness of the questions reviewed and necessary changes made.

Quality of data was also ensured through (i) crosschecking of completed questionnaires on daily basis and recording of observations and confirmation of measles, severe malnutrition and death cases by supervisors. All households sampled were visited and recorded including households without anyone present at the time (ii) daily review undertaken with the teams to address any difficulties encountered, (iii) progress evaluation was carried out according to the time schedule and progress reports shared with partners on regular basis, (iv) continuous data cleaning upon and after entry which made it easy to detect any outliers/ mistakes and to replace or repeat households depending on magnitude of error (v) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights and (vi) continuous reinforcement of good practices. Moreover, the CHECK program of EPI 6 computer package was used to control and eliminate errors during data entry by setting conditions such that any data outside the range was automatically rejected e.g. a child's age was set to have values from 6 to 59 and values outside this range were automatically rejected. All measurements were loudly shouted by both

the enumerators reading and recording them to reduce errors during recording.

3.6 Data Processing & Analysis

3.6.1 Data entry, cleaning, processing and analysis

Data was entered and analysed using Nutrisurvey, SPSS and EPI6 computer based packages. Running and tabulating all variable frequencies was carried out as part of data cleaning. The Nutrisurvey Anthropometry and EPINUT programmes were 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). Cleaning and analysis of certain variables was undertaken in Microsoft Excel.

3.6.2 Characteristics of assessment population and other variables

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

3.6.3 Creation of nutritional status indices

The anthropometric measurement of weight and height were used to compute the WFH nutritional status indicators of the studied children. Weight for Height (WFH) 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 ≤WFH< -2 Z-Scores	= Moderate acute malnutrition
<-2 Z-score or oedema	= Global/total acute malnutrition
≥ -2Z-Scores	= Normal

Similarly, MUAC measurements were also used to classify children into categories of nutritional status and mortality risks as follows according SACB Nutrition assessment guidelines:

<11.0 cm	= Severe malnutrition
>=11.0 < 12.5	= Moderate malnutrition
>=12.5 -- < 13.5	= At risk of Malnutrition
>=13.5 cm	= Normal

For adults, the following categories (WHO) were used:

a) For non pregnant women:

< 16.0 cm	= Severe Acute malnutrition
< 18.5 cm (with oedema)	= Severe acute Malnutrition
≤ 18.5 cm	= Global (Total) Acute Malnutrition
> 18.5 cm	= Normal

b) For pregnant women:

≤ 20.7 cm	= Severely at risk
≤ 23.0 cm	= Total at risk
> 23.0 cm	= Normal

4 ASSESSMENT RESULTS

4.6 Household Characteristics of Study Population

The nutrition assessment covered a total of 501 households (506 less 5 purged households) with a mean household size of 5.4 (SD= 2.2) persons. The mean number of the under fives per household was 1.9 (SD=0.9).

Table 3: Household Characteristics

Characteristics	*n*	*%*	*95% CI*
Total number of HHs assessed	501	100	
Household Size	Mean= 5.4		SD= 2.2
Number of Underfives	Mean= 1.9		SD= 0.9
Residential status: (N=501)			
Residents	494	98.6	97.0 – 99.4
IDPs	4	0.8	0.3 – 2.2
Internal Immigrants	2	0.4	0.1 – 1.6
Returnee	1	0.2	0.0 – 1.3
Origin (N=7)			
South Somalia	5	71.4	
Outside Somalia	2	28.6	
Duration of Stay (N=7)			
24 months	1	14.3	
36 months	1	28.6	
54 months	2	57.1	
84 months	3	42.9	
Reason for Migration (N=7)			
Civil insecurity	2	28.6	
Search for employment	5	71.4	

Most (98.6%) of the assessed households were residents[4], 0.8% were IDPs and the rest of the households were either internal immigrants (0.4%) or returnees (0.2%). The non residents were mainly (71.4%) from South Somalia.

All the non residents had stayed in their current locations for at least 24 months even though they still did not consider themselves locals, hoping to return to their original locations at some point. The main reasons for movement were food shortage, search for employment (71.4%) and civil insecurity in their areas or origin (28.6%)

Table 4: Distribution of households by means of livelihood and Source of Income

	n	% (CI)
Livelihoods (N=501)		
Pastoral	295	58.9 (54.4 – 63.2)
Fishing	144	28.7 (24.9 – 33.0)
Urban	57	11.4 (8.8 – 14.6)
Destitute	5	1.0 (0.4 – 2.5)
Main Source of Income (N=501)		
Sale of animals (& products)	169	33.7 (29.6 – 38.1)
Casual labour	139	27.7 (23.9 – 31.9)
Frankincense	93	18.6 (15.3 – 22.3)
Fish sales	65	13.0 (10.2 – 16.3)
Petty trade	23	4.6 (3.0 – 6.9)
Crops sales	11	2.2 (1.2 – 4.0)
Salaried employment	1	0.2 (0.0 – 1.3)

The majority of the surveyed households were pastoral (58.9%). Slightly more than one quarter (28.7%) depended on fishing as their livelihood system while some 11.4% were in urban livelihood. A further 1.0% were total destitute. Sale of animals and their products (33.7%) and casual labour (27.7%) were the two main sources of income to most households. Some 18.6% of the households depended on collection and sale of frankincense as their source of income. Other sources of income include fish sales (13.0%), petty trade (4.6%), crop sales (2.2%) and salaried employment (0.2%).

[4] Residents were taken as those who dwelt in the places of their residences for an extended period or permanently

4.7 Water Access and Quality

Most (70.5%) of the surveyed households drew water from unprotected water sources, mainly *berkads*. A significant proportion however had access to safer tap water (15.4%) or springs (14.2%).

Table 5: Water Access and Quality

Water access and Quality	*N*	*% (CI)*
Main source of drinking water (N=501):		
Unprotected wells/ berkads	353	70.5 (66.2 – 74.4)
Tap/ pipe	77	15.4 (12.4 – 18.9)
Protected wells/springs	71	14.2 (11.3 – 17.6)
Distance to nearest water point (N=501):		
≤ 500 meters	304	60.7 (56.2 -65.0)
501m - < 1 km	160	31.9 (27.9 – 36.2)
1 – 3 km	26	5.2 (3.5 – 7.6)
≥4 km	11	2.2 (1.2 – 4.0)
Number of clean water containers:		
1 - 2 containers	304	60.7 (56.2 – 65.0)
3 - 4 containers	125	25.0 (21.3 – 29.0)
5 containers	30	6.0 (4.1 – 8.5)
> 5 containers	42	8.4 (6.2 – 11.2)
Method of water storage:		
Covered containers	362	72.3 (68.1 – 76.1)
Open containers	126	25.1 (21.5 – 29.2)
Constricted neck (*Ashun*)	13	2.6 (1.4 – 4.5)

Although the water sources did not provide good quality water to majority, most households (60.7%) were within reasonable distance (≤500 metres) to the sources as recommended by Sphere guidelines (2004). Households also had insufficient clean water storage and collecting containers implying that they require frequent trips to fetch water. About 61% of the households have only 1-2 containers for fetching or storing water. Sphere guidelines recommend a minimum of 2 clean containers of 10-20 litres for water collection alone, in addition to enough storage containers to ensure there is always water in the household. About one-quarter store drinking water in open containers exposed to dust and parasite contamination.

4.8 Sanitation and Hygiene Practices

Table 6: Distribution of households by sanitation & Hygiene

Sanitation and hygiene	n	% (CI)
Access to Sanitation facility (N=501)		
Flash toilets	38	7.6 (5.5 – 10.4)
VIP latrines	12	2.4 (1.3 – 4.3)
Traditional pit latrine	133	26.5 (22.8 – 30.7)
Bush	318	63.5 (59.1 – 67.7)
Distance from latrine to water source (N=183)		
< 30meters	164	89.6
≥ 30 meters	19	10.4
Washing agent		
Soap	431	86.0 (82.6 – 88.9)
Shampoo	28	5.6 (3.8 – 8.1)
Ash	32	6.4 (4.5 – 9.0)
Plant Extracts	4	0.8 (0.3 – 2.2)
None	6	1.2 (0.5 – 2.7)
Method of Food Storage (N=501)		
Suspended in hooks/ropes	26	5.2 (3.5 – 7.6)
Put in pots beside fire	95	19.0 (15.7 – 22.7)
Put in covered containers	179	35.7 (31.6 – 40.1)
Don't store	201	40.1 (35.8 – 44.6)

Most (63.5%) of surveyed households had no access to sanitation facilities and used the bush.

Traditional pit latrines (26.5%), flush toilets (7.6%) and improved ventilated pit latrines (2.4%) were reported as the commonly used for those households who had access to sanitation facilities. In most (89.6%) of these cases, the distance between latrine and water source was less than 30 meters. Sphere (2004) guidelines recommend a minimum distance of 30 meters between underground water point and a latrine.

Most (86.0%) of the households had soap for washing. This is a positive indication of good hygiene standards.

About 40% of the households assessed did not store any food. However 35.7% stored food (e.g. meat) in covered containers. This is risky as it increases the rate of deterioration especially for high protein foods, while 19.0% stored food in pots besides fire. Some 5.2% of the households suspend their food from ropes/hooks.

4.9 Health Seeking Behaviour

Slightly less than one-half (47.7%) of the assessed children reportedly fell sick during two weeks prior to the assessment. The majority of them (48.6) sought health care assistance from private clinics/pharmacy. Only 7.8% of the children who reportedly fell ill sought assistance from public health facilities while the rest were administered self-prescription/medication by their caregivers (4.8%) or were attended to by traditional healers (11.2%). About 28% were not given any medical intervention at all when they fell ill mainly for lack of money or because the health facilities are far away from the households.

Table 7: Health seeking behaviour (N=919)

	n	% (CI)
Child fell sick?		
Yes	438	47.7 (44.4 – 50.9)
No	481	52.3 (49.1 – 55.6)
Where assistance was sought (N=438)		
Private clinic/ pharmacy	213	48.6 (43.9 – 53.4)
Public health facility	34	7.8 (5.5 – 10.8)
Own medication	21	4.8 (3.1 – 7.4)
Traditional healer	49	11.2 (8.5 – 14.6)
No assistance sought	121	27.6 (23.5 – 32.1)

4.10 Formal and informal humanitarian support

Only 0.8% of the households reported having received some informal support during three months prior to assessment. This social support was mainly in the form of small loans (0.6%), gifts (0.2%) or remittances from abroad (0.2%).

Table 8: Formal and informal support

	N	**% (CI)**
Informal support (N = 501)		
Received:		
Yes	4	0.8 (0.3 – 2.2)
No:	497	99.2 (97.8 – 99.7)
Type of support (N=508)		
Remittances from abroad	1	0.2 (0.0 – 1.3)
Gifts	1	0.2 (0.0 – 1.3)
Loans	3	0.6 (0.2 – 1.9)

Formal support was not received by any of the assessed households suggesting that there are no current humanitarian interventions in the areas.

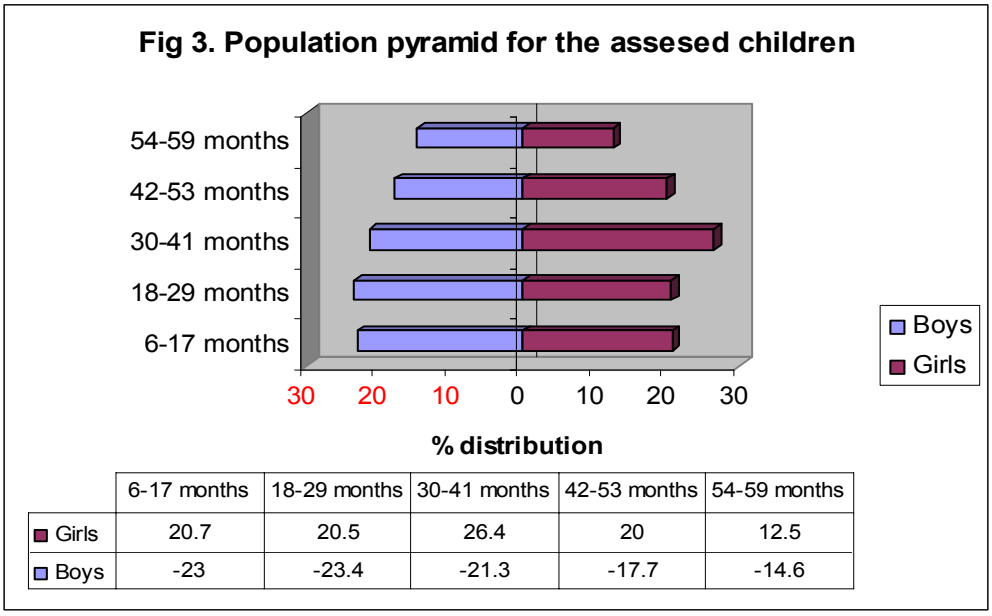
4.11 Characteristics of assessed children

Table 9: Distribution of children according to age and sex

Age	Boys		Girls		Total		Ratio
	n	*%*	*n*	*%*	*n*	*%*	
6-17 months	110	54.7	91	45.3	201	21.9	1.21
18-29 months	112	55.4	90	44.6	202	22.0	1.24
30-41 months	102	46.8	116	53.2	218	23.7	0.88
42-53 months	85	49.1	88	50.9	173	18.8	0.97
54-59 months	70	56.0	55	44.0	125	13.6	1.27
Total	479	52.1	440	47.9	919	100	1.09

A total of 919 children were surveyed from 501 households of whom 52.1% were boys and 47.9% were girls. The ratio of boys to girls was 1.09[5], showing that sample selection was unbiased. Each age group as shown in table 9 represented between 18% and 24% but for those over 54 months (13.6%).

[5] Ideally the sex ratio should be 1, but any value from 0.8 to 1.2 is acceptable (CDC/WHO).



	6-17 months	18-29 months	30-41 months	42-53 months	54-59 months
Girls	20.7	20.5	26.4	20	12.5
Boys	-23	-23.4	-21.3	-17.7	-14.6

Figure 3 shows the population pyramid of the assessed 919 children in Allula, Kandala and Iskushuban districts.

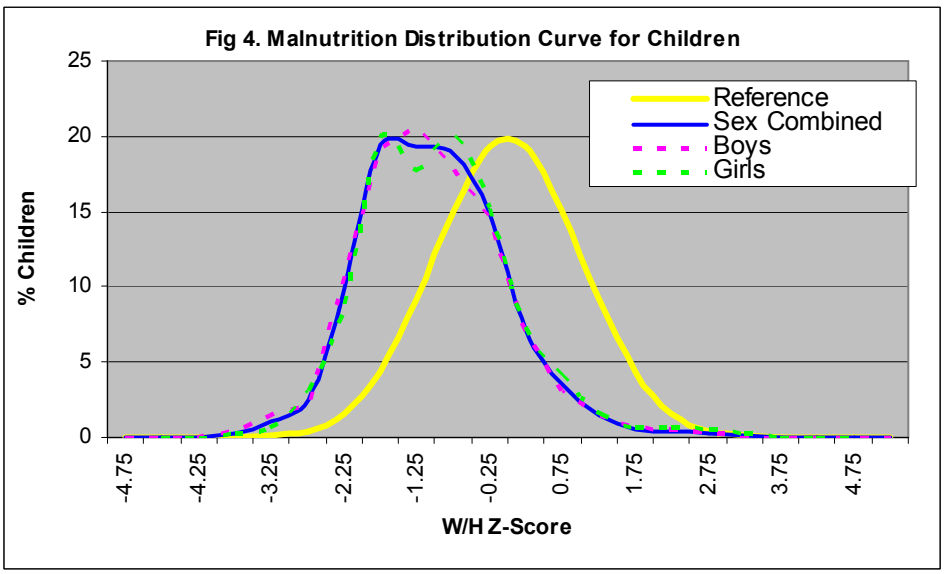
The pyramidal shape is typical for a normal population indicating that there was no bias in the selection of children by age.

4.12 Nutritional status of assessment children using anthropometry

Table 10: Summary of Global Acute malnutrition and Severe Acute Malnutrition

Malnutrition Rates	*No*	*Proportion*
Global Acute Malnutrition (<-2 Z score or oedema)	127	13.8 (11.0 – 16.6)
Severe Acute Malnutrition (<-3 Z score or oedema)	15	1.6 (0.9 – 2.4)
Oedema	2	0.2 (0.0 – 0.5)

The global acute malnutrition using WFH Z score (<-2 z-scores or oedema) was 13.8% (CI: 11.0 – 16.6) while severe acute malnutrition (<-3 z-score or oedema) was 1.6 % (CI: 0.9 – 2.4). Two cases (0.2%) of oedema were detected during the assessment and were referred by the assessment team to the nearest health centre.



Distribution of the weight-for-height scores (mean=-1.01; median=-1.06; SD=0.99) were skewed towards the left depicting a poorer nutrition situation according to international (WHO) standards (Fig 4).

Table 11: Distribution of children by nutritional status (WHZ-score or oedema) and child sex

Nutrition status categories	*Males*		*Females*		*Total*	
	No	*% (CI)*	*No*	*% (CI)*	*No*	*% (CI)*
Global acute malnutrition (WFH<-2 z score/oedema)	71	14.8 (11.8 –18.4)	56	12.7 (9.8 – 16.3)	91	**13.8** (11.0 – 16.6)
Severe acute malnutrition (WFH <-3 z score/oedema)	11	2.3 (1.2 – 4.2)	4	0.9 (0.3 – 2.5)	15	**1.6** (0.9 – 2.4)
Oedema	2	0.4 (0.1 – 1.7)	0	0	2	**0.2** (0.0 – 0.5)

About 15% of boys and 12.7% of girls were acutely malnourished in the surveyed population using weight for height <-2 Z score or presence of oedema. However, statistically both sexes were equally likely to be malnourished (p> 0.05).

Table 12: Distribution of Acute Malnutrition by Age

Age groups	Severe (WH<-3Z)	Moderate (WH>=-3Z< -2Z)	GAM (Total malnourished-WH<-2Z)	Normal (WH>=-2Z)	Total
6-17 months	3 (1.5%)	19 (9.5%)	22 (10.9%)	179 (89.1%)	201 (21.9%)
18-29 months	5 (2.5%)	27 (13.4%)	32 (15.8%)	170 (84.2%)	202 (22.0%)
30-41 months	3 (1.4%)	23 (10.6%)	26 (11.9%)	192 (88.1%)	218 (23.7%)
42-53 months	3 (1.7%)	19 (11.0%)	22 (12.7%)	151 (87.3%)	173 (18.8%)
54-59 months	1 (0.8%)	24 (19.2%)	25 (20.0%)	100 (80.0%)	125 (13.6%)
Total	13 (1.4%)	114 (12.4%)	127 (13.8%)	792 (86.2%)	919 (100%)

The proportion of malnourished children was highest (20%) among the 54-59 months age category followed by 18-29 age bracket (15.8%) and was lowest (10.9%) among the younger 6-17 months age bracket. However, analysis of distribution of malnutrition between the breastfeeding age group 6-24 months and the 25-59 months category showed no statistical difference (p>0.05).

Table 13: Malnutrition prevalence using WFH percentage of median categories

Nutrition status categories	Males		Females		Total	
	No	*Proportion (%)*	*No*	*Proportion (%)*	*No*	*Proportion (%)*
Global acute malnutrition (WFH<80% or oedema)	43	9.0 (6.6 – 12.0)	31	7.0 (4.9 -10)	74	**8.1** (6.4 – 10.1)
Severe acute malnutrition (WFH<70% or oedema)	5	1.0 (0.4 – 2.60	1	0.2 (0.0 – 1.5)	6	**0.7** (0.3 – 1.5)

The global acute malnutrition among children aged 6 – 59 months using weight for height <80% of median or presence of oedema was 8.1% (CI: 6.4 – 10.1), while severe acute malnutrition <70% of median or presence of oedema was 0.7% (CI: 0.3 – 1.5%).

Using mid upper arm circumference (MUAC) measurements for children aged 12-59 months, 9.2% (CI: 7.4 – 11.5) of the children were malnourished (MUAC<12.5 cm or oedema), an underestimation in comparison to weight-for-height Z score measurements. About 2.4% (CI: 1.5 – 3.8) were severely malnourished (MUAC<11.0 cm or oedema) while an additional 13.7% (CI: 11.5 – 16.4%) were at risk (MUAC 12.5-<13.5 cm) of malnutrition.

Table 14: Nutrition status of Children (12-59 months) by MUAC

Malnutrition	*Males*		*Females*		*Total (N=801)*	
	N	%	N	%	N	% (95% CI)
Severe (MUAC <11 cm or oedema)	4	1.0 (0.3-2.6))	15	3.9 (2.3-6.4)	19	**2.4** (1.5-3.8)
Moderate (11≤MUAC<12.5 cm)	24	5.8 (3.8 – 8.6)	31	8.0 (5.6-11.3)	55	6.9 (5.3-8.9)
Total (MUAC <12.5 cm or oedema)	28	6.8 (4.6 – 9.8)	46	11.9 (8.9-15.6)	74	**9.2** (7.4-11.5)
At risk (MUAC 12.5- <13.5 cm)	51	12.3 (9.4 – 16.0)	59	15.2 (11.9-19.3)	110	13.7 (11.5-16.4)
Normal (MUAC >=13.5 cm)	334	80.9 (76.7 – 84.5)	283	72.9 68.2-77.2)	617	77.0 (73.9-79.9)
Total	413	51.6 (48.0 – 55.1)	388	48.4 (44.9-52.0)	801	100

4.13 Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

The incidence of reported diarrhoea (28.1%), ARI (25.7%) and febrile illness (19.7%) within two weeks prior to the assessment remained high but showed a general decline compared to reported incidences in the previous survey in 2002 (diarrhoea, 26.5%; ARI, 48.9% and suspected malaria 32.2%) Furthermore, no outbreak was reported during the period. The incidence of suspected measles among children aged 9-59 months one month prior to the assessment was 2.9%.

Table 15: Morbidity, measles immunisation, polio vaccination and vitamin A supplementation

	No.	%(CI)
Incidence of major child illnesses (N=919)		
Diarrhoea within two weeks prior to assessment	258	28.1 (21.2 – 35.0)
ARI within two weeks prior to assessment	236	25.7 (18.8 – 32.5)
Febrile illness/suspected malaria) within 2 weeks prior to assessment	181	19.7 (17.2 – 22.4)
Suspected measles within one month prior to the assessment (N=852)	25	2.9 (1.3 – 4.6)
Immunization Coverage (N=916)		
Children (9-59 months) immunised against measles (N=852)	250	29.3 (19.2 – 39.4)
Children who have ever received Polio dose (N= 919)	771	83.9 (77.5 – 90.3)
Vitamin A supplementation (N= 919)		
Children who received Vitamin A supplementation in past 6 months or before	441	48.0 (37.3 – 58.6)
Micronutrients Deficiencies (N=501)		
Households who reported night blindness (N=501)		
Member with night blindness (n=10):		
24 – 71 months	0	0
6 years or more	10	2.0 (1.0 – 3.8)

Measles vaccination coverage for eligible children (9-59 months old) was very low at only 29.3% as was coverage for vitamin A supplementation (48%). Most (83.9%) of the children aged 6-59 months had received at least a dose of polio vaccine. Coverage for all these health programmes fell far below the recommended 95% level (Sphere, 2004).

4.9 Vitamin A Deficiency

About 2.0% of the households reported cases of night blindness, which is a proxy indicator of vitamin A deficiency. All of these night blindness cases were reported among children and adults aged 6 years or more.

4.10 Feeding practices

None of the children, in the breastfeeding age group of 6-24 months, were exclusively breastfed for the recommended first six months and only 44.6% of the children aged 6-24 months (N=287) were breastfeeding at the time of the assessment. About two-thirds (68%) of the children who

were breastfeeding (N=128) breastfed on demand as recommended. Of those who had stopped breastfeeding (N=159), 35.8% had stopped breastfeeding before six months of age, 36.5% before their first birthday and about one-quarter within their second year of life. About 2% of the children aged 6-24 months were not breastfed at all.

Table 16: Children feeding practices

Children aged 6-24 months (N=287)	N	% (CI)
Is child breastfeeding?		
Yes	128	44.6 (38.8 – 50.6)
No	159	55.4 (49.4 – 61.2)
Breastfeeding frequency (N=128)		
1-2 times	2	1.6
3-6 times	39	30.4
On demand	87	68.0
Age stopped breastfeeding (N=159):		
0 - 5 months	57	35.8
6 - 11 months	58	36.5
12 – 18 months	37	23.3
More than 18 months	4	2.5
Never breastfed	3	1.9
Introduction of Complementary feeding (N=287)		
0 - 3 months	198	69.0 (63.3 – 74.3)
4 – 5 months	51	17.8 (13.5 – 22.7)
6 months	35	12.2 (8.6 – 16.6)
7 or more months	3	1.0 (0.2 – 3.0)
Feeding frequency (n=287):		
Once	25	8.7 (5.7 – 12.6)
2 times	67	23.3 (18.6 – 28.7)
3 – 4 times	164	57.1 (51.2 – 62.9)
5 or mores times	31	10.8 (7.5 – 15.0)

Most (69%) of the children aged 6-24 were prematurely introduced to foods other than breast milk between the time of birth and the third month of life. About 18% were introduced to complementary feeding at 4-5 months and only 12.2% were rightly introduced to complementary feeding at the recommended 6 months of age. The rest (1.0%) were initiated to complementary feeding late at 7 months or more.

Infrequent feeding of the assessed children (6-24 months) was reported with some 8.7% of the children fed only once a day mainly on cereal-based diets. Slightly less than one-quarter (23.3%) were fed only twice a day. Most of the assessed children were fed 3-4 times (57.1%). Only 7.9% were fed 5 or more times as recommended by Facts for Life (2002). Early breastfeeding stoppage, premature introduction of complementary foods and infrequent feeding of the children all indicate suboptimal child feeding practices among the community.

4.11 Dietary Diversity

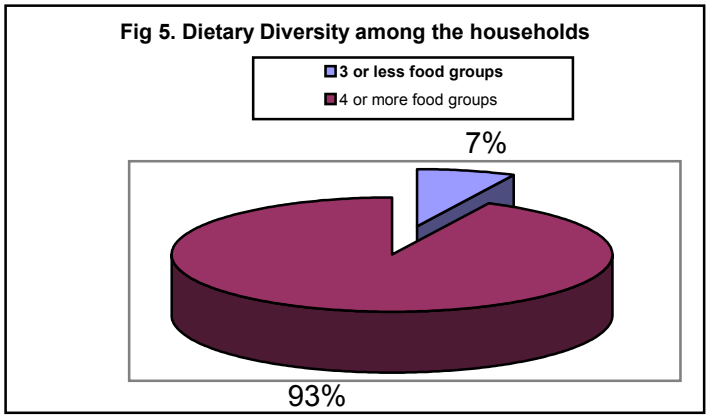
No of food groups consumed (N=501)	N	% (CI)
2 food groups	2	0.4 (0.1 – 1.6)
3 food groups	34	6.8 (4.8 – 9.4)
4 food groups	61	12.2 (9.5 – 15.4)
5 food groups	100	20.0 (16.6 – 23.8)
6 food groups	137	27.3 (23.5 – 31.5)
7 food groups	65	13.0 (10.2 – 16.3)
8 food groups	65	13.0 (10.2 – 16.3)
9 food groups	29	5.8 (4.0 – 8.3)
10 food groups	6	1.2 (0.5 – 2.7)
11 food groups	1	0.2 (0.0 – 1.3)
12 food groups	1	0.2 (0.0 – 1.3)
1-3 food groups	36	7.2 (5.2 – 9.9)
≥ 4 food groups	465	92.8 (90.1 – 94.8)
Mean HDDS	6.0	SD= 0.1
Main source of food (N=501)		
Purchasing	488	97.4 (95.5 – 98.6)
Own production	2	0.4 (0.1 – 1.6)
Gifts/donations	1	0.2 (0.0 – 1.3)
Borrowing	10	2.0 (1.0 – 3.8)

Some 0.4% of the households had consumed only two food groups in 24 hours prior to the assessment. Six food groups were the most frequently consumed reported in 27.3% of the households within the same period. Households consumed an average (HDDS) of 6 food groups (SD=0.1) with the number of food groups consumed ranging from two to twelve.

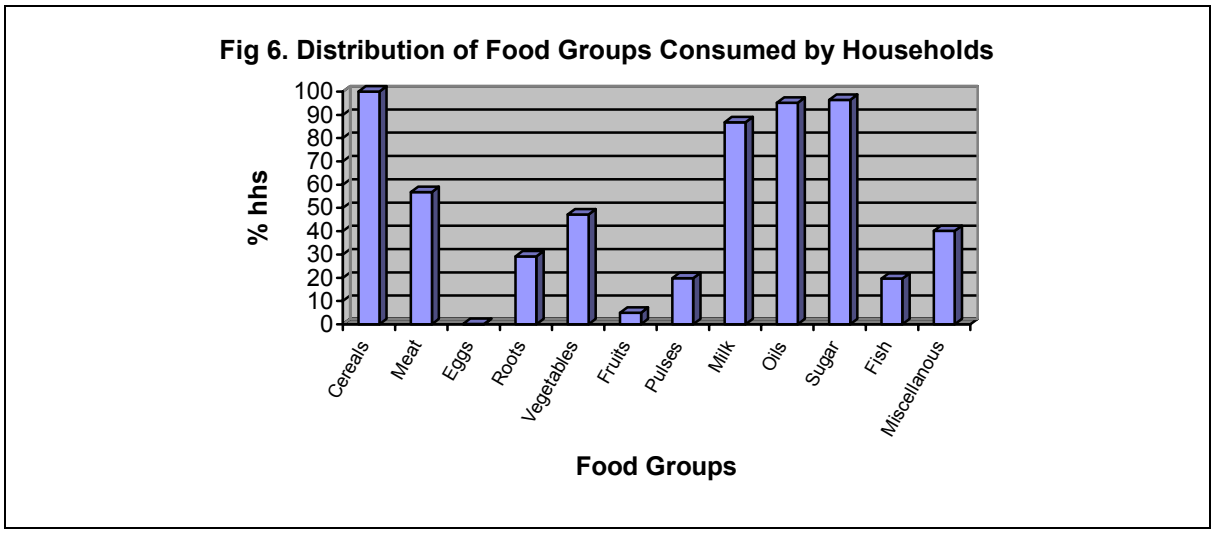
Almost all (97.4%) of the households surveyed obtained their food mainly through purchasing. The remaining few borrowed food (2%), produced their own (0.4%) or obtained their food as gifts (0.2%).

Table 17: Distribution of dietary diversity among households

As shown on figure 5, only about 7% of the households had consumed three or fewer food groups within 24 hours prior to the assessment. Most households (93%) consumed a more diversified diet of four or more food groups.



Cereals provided the bulk of the food in the household diet. Figure 6 shows that cereal-based diets were consumed by all the assessed households. Other food items commonly consumed were milk (86.8%), oil/fat (95.2%) and sugar as tea (96.4). About 57% of the households consumed meat in a 24- hour recall period prior to the assessment. Eggs (0.2%), fruits (5%) and fish (19.6%) were the least consumed by the households.



4.12 Adult Malnutrition by MUAC

About 1.5% of non-pregnant women (aged 15-49 years) were acutely malnourished (MUAC<18.5cm) while 0.4% were at severe risk of acute malnutrition (MUAC<16.0 cm) (N=524).

Table 18: Adult nutrition status by MUAC

	n	%	95% CI
Total mothers assessed	492		
Total non mothers assessed	32		
Total women assessed	524	100	
Non Pregnant (N=421)			
Severe acute malnutrition (MUAC<16.0 cm)	2	0.4	0.1 – 1.5
Global acute malnutrition (MUAC≤18.5)	8	1.5	0.7 – 3.1
Normal	516	98.5	96.9 – 99.3
Pregnant women (N=103)			
Severe Risk (MUAC≤20.7 cm)	49	9.4	
Total at risk (MUAC≤23.0 cm)	146	27.9	
Normal	378	72.1	

More than one quarter (27.9%) of pregnant women (N=103) were malnourished (MUAC<23.0cm) and 9.4% were at severe risk of acute malnutrition (MUAC<20.7cm). The high nutritional risk in the pregnant women is attributable to dietary intake to meet increased nutrient demands and limited access to healthcare services.

4.13 Relationship between acute malnutrition and other factors

Table 19: Risk factors and relation to total malnutrition (WHZ<-2)

Exposure variable	*N*	*(%)*	*Crude RR*	*95% CI*	*p-value*
Child sex:					
Male	71	14.8	1.16	0.84 – 1.61	0.41
Female	56	12.7			
Age group					
6-24 months	32	11.1	0.74	0.51 – 1.04	0.14
25-59 months	95	15.0			
Morbidity patterns					
Illness					
Yes	74	16.9	1.53	1.1 – 2.13	0.01*
No	53	11.0			
ARI					
Yes	42	17.8	1.43	1.02 – 2.01	0.04*
No	85	12.4			
Diarrhoea:					
Yes	41	15.9	1.22	0.87 – 1.72	0.26
No	86	13.0			
Health programmes					
Vitamin A Supplement:					
Yes	67	15.2	1.21	0.88 – 1.67	0.25
No	60	12.6			
Measles vaccine (N=852)					
Yes	37	14.8	1.09	0.76 – 1.5	0.65
No	82	13.6			
Dietary & feeding patterns					
Breastfeeding (N=287)					
Yes	13	10.1	0.8	0.41 – 1.55	0.51
No	20	12.6			
Breastfeeding frequency					
On demand	6	6.9	1.89	0.80 – 4.42	0.13
Infrequently	26	13.0			
Breastfeeding stoppage					
Before 12 months	28	11.5	1.27	0.47 – 3.44	0.64
At ≥ 12 months	4	9.1			
Feeding frequency					
5 or more times/day	2	6.5	1.82	0.46 – 1.23	0.38
< 5 times/day	30	11.7			
Dietary diversity					
≤ 3 food groups	11	17.2	1.27	0.72 – 2.23	0.42
≥ 4 food groups	116	13.6			

Illness was significantly associated with malnutrition. Children who fell ill were 1.5 times more likely to be malnourished than those who did not fall sick (p=0.01, RR=1.53; CI: 1.1 – 2.13). In particular, ARI (p=0.04) and diarrhoea (p=0.26) showed a significant association with malnutrition. Children from households who drew water from unprotected sources were also more likely (p<0.05) to experience diarrhoea episodes.

Further analysis revealed no significant association between malnutrition and other factors like age group, child sex, feeding practices and immunization status.

4.14 Death rates

A total of 905 households were surveyed for mortality indicator with a recall period of 90 days prior to the assessment being used. The results generated by the Nutrisurvey software were as presented below:

Death rates;
For children aged 0-59 months (under-five mortality or death rate)

$$\text{0-5DR} = \frac{\text{Number of deaths of children 0-5 years}}{\left(\frac{\text{Mid point Population* no. of children 0-5}}{\text{10, 000}}\right) \times \text{Time interval}} = \text{Deaths/10,000/day}$$

* Mid point population = (Population at present + Population at beginning of recall)/2
Population at beginning of recall = (population present + left + deaths) – (joined + births)

Under five population (mid point) in surveyed households	=1,006
Number of under fives who joined the households	= 4
Number of under fives who left the households	= 20
Number of births	= 25
Number of under five deaths	= 9

Under five death rate (deaths /10,000 children per day) = **0.99** (CI: 0.26 - 1.73)

For the total population (Crude mortality/death rate):

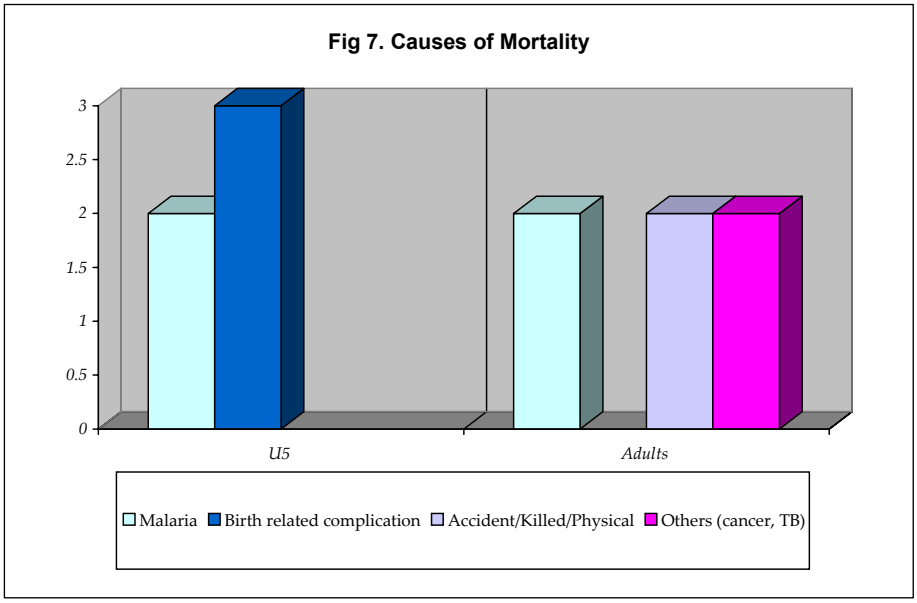
$$\text{CDR} = \frac{\text{Number of deaths}}{\left(\frac{\text{Total Mid point Population}}{\text{10, 000}}\right) \times \text{Time interval}} = \text{Deaths/10,000/day}$$

Total population in surveyed households	= 4,177
Total people who joined the households	= 24
Total people who left the households	= 397
Total number of births	= 25
Total number of deaths in the households	= 15

CMR as deaths per 10,000 persons per day =**0.38** (CI: 0.18 - 0.59)

Both under five and crude death rates reflect a normal situation according to the international standards (WHO classification).

Figure 5: Causes of under five mortality



As shown on figure 7, birth related complications (poor birth outcome) and suspected malaria were the main reported factors associated with under-five mortality.

Malaria and accidents/fighting were the main reported causes of death among children under five years of age. Others like cancer and TB were described as possible factors associated with death among adults.

4.15 Qualitative information

Qualitative information was collected from observations, focus group discussions and key informants. A total of 6 focus group discussions were held, with mothers and with men (elders). The discussions were centred on feeding and care practices, health care, food security, and water and sanitation issues.

4.15.1 Care and feeding practices

Breastfeeding duration for children is usually 12 months from birth. Water is given mostly at birth. A sugary solution is given to the baby within the first week of birth while most children are given complementary food (animal milk – mostly goat milk) before they are one month old. For most children, semi solid foods are introduced as early as 3-4 months of age and solid foods like rice or canjera are introduced at the age of 8-12 months. Main foods given to infants (0 – 12 years) are goat milk 3 to 4 times a day in most cases and sometimes *canjero* or rice mixed with sugar and oil/butter and porridge (flour + sugar + oil).

4.15.2 Change in dietary consumption 3 months before the survey.

Availability and access of goat milk, camel milk, rice, sugar, and oil increased within the previous 3 months before the survey. Households reported that milk consumption has improved after the rains due to an increase in livestock productivity among the middle wealth group. Access is however constrained by poor infrastructure. Fish consumption was low during the assessment which coincided with the off- fishing season when tides are rough and fishing is impossible. The poor households felt that nothing has changed or indeed their situation has worsened due to lack of income to purchase food.

4.15.3 Constraints faced by women in providing adequate food to their households.

Food insecurity/hunger and sometimes ill health are the major constraints to breastfeeding of young children below two years. However cultural beliefs also negatively affect breastfeeding. Lack of water, cooking & storage facilities and too much work for women are the main hindrances to food preparation and storage. Women have to travel long distances at times (during dry spells) or spend a lot of time away from home and do not have enough time to prepare food.

4.15.4. Water and sanitation

The main source of water is the Berkads/ shallow wells which are usually untreated. However, some villages have access to clean tap/spring water. In both instances water is neither treated at the point of collection nor the point of use. The distance to the water source is within 500 meters radius for most households and each household member uses on average 10 litres of water per day. Most households use the bush for human waste disposal including that of the children. For the majority who have access to sanitation facilities the distance to the water source is inadequate (< 30 m) in accordance to international standards. Each of these latrines is usually used by an average of 2-3 families.

4.15.5. Changes in prices of major commodities in the region in the last 3 months.
The prices for the major commodities consumed by the community generally remained constant or increased in the last 3 months. The price of wheat flour (used for making *canjera*), rice and sugar increased by at least one dollar per bag since June 2006. Moreover, the price of fuel went up by about 3 dollars per litre. However, the prices of water and milk declined over the same period which is attributed to the onset of *Gu* rains such that milk supply increased. In addition most households did not need to buy water as rains filled most of the *berkads*- the main sources of water.

4.15.6. Main income sources.
Dates, sale of livestock and their products and frankincense were the most important income sources. Furthermore seasonal fish sales and petty trade also provided significant sources of income to supplement livestock income. The remittances from relatives were important to a few poor households but not critical as a source of income for the population.

4.15.7. Common illnesses
Among the adults in the region the most common reported illnesses include suspected malaria, bronchitis, tuberculosis, anaemia and diarrhoea. For children diarrhoea is the most common although measles, Acute Respiratory Infection (ARI) malaria and skin infections were seen as fairly common. The ubiquitous berkads are the breeding sites for mosquitoes especially during the rainy season and therefore contribute to malaria prevalence. Moreover poor sanitation leads to increased morbidity.

4.15.8 Food security situation

Climate
In August 2006, there was no precipitation throughout the livelihood zones (LZs) of Allula, Kandala and Iskushuban with characteristic dry, windy and hot weather conditions of Hagaa persisting in the Gulf of Aden coastal areas and dry, windy and cool weather along the Indian Ocean coastal. In September and October the areas received *deyr* rains that varied in terms of distribution and quantity in the Gagaab and Golis LZs.

Livestock
Recent deyr rains improved rangeland condition as well as livestock conditions especially in the previously affected areas of Gagaab LZ. Animals are in recovery for maintenance and production. However, normal kidding rate of goats are not anticipated this season due to effects of prolonged dry spell in the previous season. In Golis LZ, livestock conditions, production and reproduction was good. No outbreak of livestock diseases were reported throughout the LZs. No abnormal animal movements were reported in the previous three months.

Currently there is no water stress in the region, as most of the sources contain water. The berkads are either full or partially filled. Generally milk production is expected to increase due to the fact that all animal species are breeding at this season (Sheep, Goats and Camels). Camel milk supply is significantly expected to increase, because milk production will be available from both camels that calved last Deyr 2005 season and those calving this Gu 2006 season.
Normally during the wet seasons livestock sales are in a decreasing trend as people consume milk and reduce dry food purchases, also more heads are sold at the dry seasons to cover food

and water costs and less marketable heads are available in the animal pen. It's worth noting that during the last *Jilaal* in March, acute water stress occurred across the region that forced pastoralists to sell more animal heads to cover water trucking costs.

Overall, the livestock situation is normal and an increased herd size is expected, as all animal species are calving, kidding and lambing. The livestock body condition is improving with the effect of green pasture available at medium and low recovery. Camel milk production is expected to increase and the price has already dropped down in some pastoral settlements.

Markets

The prices of shoats and staple cereals decreased by 5% and 12.5% respectively in Iskushuban town, but remained unchanged in Balididing market in the month of September compared to the previous month. This reflected favourable terms of trade (TOT), better than even the reference year. In October, the prices of local quality shoat increased by 10% when compared to September while that of staple cereal (rice) decreased sharply by 12.5% from the previous month after reopening of the ports from the windy season and the TOT of local goat and rice increased by 25.%%. The TOT of labour and rice also improved after decline in cereal (rice) prices. The prices and TOT are summarized in the table below.

	Price (SShs*)		TOT	
August	Rice Camel milk Goat	– 5,000/ kg - 16,000/ L - 480,000	Local goat/Rice Milk/Rice Labour/Rice	- 1LQ/ 1 sack** + 46 kg - 1 L/ 3.2 kg - 1/ 8 kg
September	Rice Camel milk Goat	– 8,000/ kg - NA - 400,000	Local goat/Rice Milk/Rice Labour/Rice	- 1LQ/ 50 kg - NA - 1/ 6.25 kg
October	Rice Camel milk Goat	– 7,000/ kg - NA - 440,000	Local goat/Rice Milk/Rice Labour/Rice	- 1LQ/ 62.8 kg - NA - 1/ 7.15 kg

* 1 USD = 15,200 SShs ** 1 sack = 50 kg

Livelihood Security

In Gagaab LZ, the trend of livestock holdings continued to decrease in September as most pastoralists had been coping with the stripping of productive livestock assets and full recovery of livestock production had not yet been realized, indicating a downward shift of wealth groups. Short distance animal migration continued within Golis and Gagaab LZ as distribution of rains was uneven. Seasonal human migration to coastal settlements in search of labour and self employment was observed after the end of the windy season. The migrants are involved in fishing (especially lobster catching) and fish sales. These activities were however, limited during the Ramadhan period.

Food access by households of different wealth groups is stable except with pastoral households of Gagaab LZ. The current main source of food for households for both Golis and Gagaab LZs is through the purchase of staple cereals. Access to pastoral diet, milk will remain low among households in Gagaab LZ because of the effects of previous drought on livestock productivity.

Income from livestock sales is improving even in the previously drought affected areas of Gagaab as livestock condition continues on recovery. Income from labour and self-employment (especially charcoal production and fishing) activities are also contributing significantly to the food economy of the population. Significant changes occurred on expenditure pattern of households of all wealth groups as fuel and water prices declined.

Coping strategies:
The affected households especially in gagaab are coping with:

- Increased livestock sales
- Local loans or gifts from better-offs
- Borrow food on credit from another household *(Aamah),*
- Reduction in home milk consumption and sell more of milk produced or beg for food (*Tuugsi/dawarsi)*
- Increased charcoal production by the poor wealth group to generate income.

These mild to moderate coping strategies indicate food deficit among the poor wealth group, however the situation is likely to improve in the following 1-2 months.

5.0 DISCUSSION

5.1 Nutrition Situation

The assessment results indicate a Global Acute Malnutrition (Weight-for-Height <-2 Z score or oedema) of **13.8%** (CI: 11.0 -16.6) and a Severe Acute Malnutrition of **1.6%** (CI: 0.9- 2.4), slightly higher rates compared to the rate reported in the last nutrition assessment conducted four years earlier. The global acute malnutrition measured as weight for height percent of median (WHM<80%) was **8.1%** (CI: 6.4 – 10.1) and severe acute malnutrition (WHM<70%) was **0.7%** (CI: 0.3 – 1.5). These results indicate a serious nutrition situation according to WHO classification. The assessment results are however, consistent with the long term estimates of global acute malnutrition (10 – 14.9%) typical for this area. The last assessment of September 2002 found similar levels with a GAM of 12.6% (CI: 10.6 – 14.9) and the current findings confirm a persistently poor nutrition situation for the region.

This situation could be explained by inadequate food intake due to food, water and pasture shortages resulting from poor rainfall outcome from the previous seasons (*Deyr/heys* '05 and *Gu* '06). The consequent drought caused increase in prices of major food items (rice sugar and wheat flour) so that they were beyond the reach of the poor segment of the community. Increased expenditure on water trucking during the previous *jilaal* season increased household debt burden and left little income for food purchases. Compounded by reduced returns from the last fishing season (October '05 to April '06) and from frankincense, there was a decline in food and livelihood security in this area. The retrospective crude and under five mortality rates of 0.38 (CI: 0.18 -0.59) and 0.99 (CI: 0.26 – 1.73) deaths/10,000/day indicate acceptable levels according to WHO classification. Deaths resulting from suspected malaria and from poor reproductive health like birth complications are common among children and mothers. Maternal care services are lacking as there are no functional health facilities in the area of assessment.

Malnutrition was significantly associated with morbidity and it was higher among those who had been ill (p=0.01). Children who fell ill were 1.5 times more likely to be malnourished than those who well within two weeks prior to assessment (1.1 ≤ RR=1.53 ≤ 2.13). In particular, ARI had a significant association with malnutrition (p=0.04). A higher proportion of children with history of diarrhoea were also malnourished (15.9%) compared to those who had no diarrhoea episodes (13.0%).

5.2 Child Feeding, Food Consumption and Food Security

Suboptimal child feeding practices especially breastfeeding and complementary feeding are underlying causes of malnutrition in Allula, Kandala and Iskushuban just like in other parts of Somalia. The rate of exclusive breastfeeding is minimal and children are either not breastfed long enough or complementary feeding is not only introduced so early but given less frequently. Water and sugar solution are commonly given to children on their first day of life. Breast milk alone is sufficient for a baby for 6 months and any food/fluid other than medicine given before this age does not increase caloric intake and only displaces milk from the diet (UNICEF/WHO) and should therefore be discouraged. Early complementary food (1-3 months in this assessment) is also discouraged because of increased risks of contamination and because the child's digestive system is still too premature to handle any bulky or complex foods. Compared with nthese recommendations, the child feeding practices are far from optimal. Moreover, in the absence of animal milk (mostly available in the rainy season); the mainly cereal- based diets given to children are inadequate to meet their nutritional requirements. Residents are just coming from experiencing the impact of a dry spell and with a significant number (97.4%) relying on purchasing, and prices of major food commodities having gone up prior to the assessment, the poor households faced food deficits. However the situation could have been worse but for the onset of the *deyr* rains which is expected to be normal in most parts and so is likely lead to improved access to food/milk as a result of increased livestock production from replenished pasture and water availability. The price of milk and rice also declined. In addition, the dietary

diversity was high with 92.8% of the households consuming 4 or more food groups. These were the key factors in mitigating the nutritional situation.

5.3. Water, Sanitation and Health issues

Most of the population draw water from unprotected water catchments or wells. Most of these catchments that had dried up during the drought are now replenished with water. Water is therefore available and accessible to both human and livestock and with expected normal *deyr* rains this will remain so for at least the next two months. The rains have reduced the need for households to spend income buying water such that this income can now be used to buy other important items like food. However the quality of water, especially for human consumption, is poor. Moreover households had insufficient water holding containers implying that they require frequent trips to fetch water. About 61% of the households have only 1-2 containers for fetching or storing water yet Sphere (2004) guidelines recommend a minimum of 2 clean containers of 10-20 litres for water collection alone, in addition to enough storage containers to ensure there is always sufficient water in the household for use by each household member.

The general sanitation of the population's residential areas is poor. Access to sanitation facilities is very low with majority (63.5%) using bush for both adult and child waste disposal. Even though most (86.0%) of the households have and use soap for washing, household's hygiene is still suboptimal as appropriate food and water preservation & storage methods are not used. This, together with poor drinking water quality is likely to have contributed to incidences of diarrhoea.

6.0 RECOMMENDATIONS

Following discussions held after sharing the results with partners and detailed data analysis, both short- and long-term recommendations were made:

6.1 Short term recommendations:

1. Enhance delivery of basic health services including intensifying EPI services and setting up cold chain facilities at the district MCH
2. Rehabilitation and treatment of severely malnourished children
3. Rehabilitation and protection of water points, water treatment and provision
4. Intensify health education.

6.2 Long-term Recommendations

1. Support by agencies to re-establish and re-open health posts and centres that already exist but are not operational and to establish others in areas where there are no health facilities at all like Kandala and Allula.
2. Conduct a Knowledge, Attitude and practice (KAP) survey to understand the level of maternal knowledge and practices related to child nutrition and feeding practices
3. Enhance nutrition and health education programmes with a specific focus on good sanitation; hygiene and child feeding practices.
4. Capacity building of local health staff to enhance management of acute malnutrition at community and MCH levels.
5. Training at community level on appropriate food processing, preservation and storage techniques to enhance food security.

7.0 APPENDICES

Appendix 1: Sampling Frame for the Allula, Kandala & Iskushuban Nutrition Assessment, Sep 2006

District	Village	Population	Cum. Pop	Cluster No	
Kandala	Qandala	2500	2500	1	1394
	Butiyalo	150	2650		
	Karin one	700	3350		
	Karin two	700	4050		
	Dhankadiis	700	4750	2	4298
	Qanlaye	500	5250		
	Dawar	50	5300		
	Elgal	1000	6300		
	Unuun	2000	8300	3	7202
	Galayr	50	8350		
	Beeliwacatay	1000	9350		
	Balidhidin	3000	12350	4	10106
	Tulociise	50	12400		
	Xamure	400	12800		
	Buq	200	13000		
	Gurur	1000	14000	5	13010
	Xarago	500	14500		
	Xanjel	500	15000		
	Xijiijle	700	15700		
	Turmasale	700	16400	6	15914
	Dharin	100	16500		
	Subagle	150	16650		
	Dharas	100	16750		
	Markadan	200	16950		
	Dudad	50	17000		
	Talal	100	17100		
	Qurac	300	17400		
	Dandamale	200	17600		
	Daramadow	150	17750		
	Gatir	100	17850		
	Shebab	1000	18850	7	18818
	Dhadar	1000	19850		
	Dasan	1000	20850		
Iskushuban	Iskushuban	2000	22850	8	21722
	Biike	25	22875		
	Xiriiro	2200	25075	9	24626
	Xubabays	600	25675		
	Duud-hooyo	1300	26975		
	Rako	3000	29975	10	27530
	Liqaan	50	30025		
	Qodax	220	30245		
	Iskorsaar	950	31195	11	30434
	Biyoguduud	175	31370		
	Lamiya	525	31895		
	Fundhuca	300	32195		
	Biyo Madoobe	1250	33445	12	33338
	Garan	250	33695		

	Af-rugley	80	33775		
	Dardaarre	100	33875		
	Foocaar	960	34835		
	Xaafuun	3020	37855	13	36242
	Garduush	150	38005		
	Ciise	50	38055		
	Diriqle	75	38130		
	Timirshe	1450	39580	14	39146
	Gargoorre	800	40380		
	Hurdiya	1600	41980		
	Xandha	900	42880	15	42050
	Dharjaale	300	43180		
	Dawacaley	570	43750		
	Dharoor	2100	45850	16	44954
	Coomaan	200	46050		
Bargal	Bargal town	6000	52050	17; 18	47858; 50762
	Wadi-khayre	1820	53870	19	53666
	Taageer	2065	55935		
	Cadayo	845	56780	20	56570
	Gumbax	860	57640		
	Qoraxaad	500	58140		
	Conqoro	100	58240		
	Muudiye	2440	60680	21	59474
	Karin	175	60855		
	Hoodaa	500	61355		
	Dibir	200	61555		
	Suraryo	85	61640		
	Harshe	175	61815		
	Moqor	90	61905		
	Coomaayo	500	62405	22	62378
	Hella	90	62495		
	qori-laha	180	62675		
	Abdeexaan	180	62855		
	Ruunyo	85	62940		
	Abayaro	90	63030		
	Fagoollo	285	63315		
Allula	Allula town	1010	64325		
	Bareeda	1450	65775	23	65282
	Booco	200	65975		
	Wareeg same	200	66175		
	Ceel-quud	1700	67875		
	Barxa	700	68575	24	68186
	Ceel laas	720	69295		
	Sayn yar	720	70015		
	Sayn weyn	1050	71065		
	Tooxin	400	71465	25	71090
	Alog/Damo	105	71570		
	Xoogaad	400	71970		
	Xays laho	250	72220		
	Xabaal ambiyaad	200	72420		
	Yicis	250	72670		
	Dhuxun	200	72870		
	Tala-mugge	220	73090		
	Kawarre	360	73450		

	Garsley	80	73530		
	Xudyo	80	73610		
	Fanfar	300	73910		
	Kalaale	30	73940		
	ximisdiyo	1600	75540	26	73994
	Hursale	1400	76940	27	76898
	Liin	105	77045		
	Dibir	280	77325		
	Af-kalahaye	120	77445		
	Booli-moog	1400	78845		
	Xalwad	1100	79945	28	79802
	Xaabbo	2600	82545		
	Geesaley	1220	83765	29	82706
	Berdacad	800	84565		
	Garsa	5	84570		
	Murcanyo	1420	85990	30	85610
	Tayeega	230	86220		
	Dhurbo	250	86470		
	Gal-gala	300	86770		
	Bilcil	10	86780		
	G/wey	300	87080		
	Yamayso	30	**87110**		
		87110			
Cluster Interval		2904			
Random No		1394			

Appendix 2: Allula Kandala Nutrition Assessment Household Questionnaire, 2006

Date_____ Team Number _____ Cluster Number _____ Name of enumerator _____

Name of Village _____ District _____ Household Number _____ Name of the Respondent _____

Q1-8 Characteristics of Household

Q1 How many people live in this household (Household size)[6] ? _____

Q2 How many children are below five years in this household (Number of < 5 years)? _____

Q3 What is your present household residence status? 1= Resident[7] 2=Internally displaced person (IDP)[8] 3=Returnees[9] 4=Internal immigrant[10] 5=Other (specify) _____

If answer to the above is 1, then move to Question 7.

Q4 Place of origin 1= Within the same district 2= Within Bari region 3= South Somalia 4= Other areas, specify _____

Q5 Duration of stay (in months) _____

Q6 Reason for movement: 1= Civil insecurity/ fighting 2=Seeking jobs 3= Food shortage 4= Food/pasture/water shortage 5= Seasonal/climatic 6= Others; specify_____

Q7 What is the main livelihood systems used by this household? 1= Pastoral 2=Fishing 3=Urban 4= Destitute

Q8. What is the household's main source of income? 1= Animal & animal product sales 2= Frankincense collection/sales 3= Trade 4= Casual labour 5=Fish sales 6= Salaried/wage employment 7= Remittances/gifts/zakat 8= Others, specify _____

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

First Name	**Q9 Age** (months) *(**if** child is more than 24 months old, **skip** to **Q15**)*	**Q10** **(If 6-24 months)** Are you breastfeeding[11] the child? *(**if** no, skip to **Q12**)* *1=Yes 2=No*	**Q11 (If 6-24 months)** If breast feeding, how many times/day? *1=2 times or less 2=3-6 3=On demand*	**Q12 (If 6-24 months)** If not breast feeding, how old was the child when you stopped breast-feeding? *1= less than 6 months 2=6-11 months 3=12 – 18 months 4=≥18 months 5= Never breastfed*	**Q13** **(If 6-24 months** At what age was child given water/ foods other than breast milk? *1=0-3 months 2=4-5 months 3=6 months 4=7 months or more.*	**Q14** **(If 6-24 months)** How many times do you feed the child in a day *(besides breast milk)*? *1= Once 2= Twice 3= 3-4 times 4= 5 or more times*	**Q 15** Has child been provided with Vitamin A in the last 6 months? *(show sample)* *1=Yes 2=No*	**Q16** **(If ≥9 months old)** Has child been Vaccinated against measles in the last 6 months? *1=Yes 2=No*	**Q17** Has the child ever been given polio vaccine orally? *1=Yes 2=No*
1									
2									
3									
4									

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

[7] *A person who dwells in a particular place permanently or for an extended period*

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

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

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

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

Q17-27 Anthropometry and morbidity for children aged 6 – 59 months or (65 – 109.9cm) in the household

First Name *Follow same order as per table on page 1*	**Q18** **Child Sex** *1=Male* *2=Female*	**Q19** **Oedema** *1=yes* *2=no*	**Q20** **Height (cm)**	**Q21** **Weight (kg)**	**Q22** **MUAC (cm)**	**Q23** Diarrhoea[12] in last two weeks *1= Yes* *2= No*	**Q24** Serious ARI[13] in the last two weeks *1=Yes* *2=No*	**Q25** Febrile illness/ suspected Malaria[14] in the last two weeks *1=Yes* *2=No*	**Q26** **(If ≥9 month)** Suspected Measles[15] in last one month *1=Yes* *2=No*	**Q27** [Applicable for a child who suffered any of the diseases in Q23 – 26) Where did you seek healthcare assistance when (Name of child) was sick? *1=No assistance sought* *2=Own medication* *3=Traditional healer* *4=Private clinic/ Pharmacy* *5= Public health facility*
1										
2										
3										
4										

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

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

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

Q29 Does any member of the household have difficulty seeing at night or in the evening when other people do not? 1= 2- <6 years 2= ≥ 6 years 3= None

Q30-33 Access to water (quality and quantity)

Q30 Main source of drinking water 1 = Tap/ piped water 2= Protected wells, boreholes 3 = Unprotected open /shallow wells or berkads 4=Others, specify _____

Q31 Average distance to the nearest water point 1= ≤500 meters 2=501m – 1 km 3= 1-3 km 4= more than 3 km

Q32 Number of water collecting and storage containers of 10-20 litres in the household: 1=1-2 containers 2= 3-4 containers 3=4-5 containers 4= more than 5

Q33 What is the method of water storage in the household? 1=Covered containers 2=Open containers 3=Constricted neck/end *(Ashuun)*

[12] Diarrhoea is defined for a child having three or more loose or watery stools per day

[13] *ARI asked as oof wareen or wareento. The three signs asked for are cough, rapid breathing and fever*

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

[15] *Measles (Jadeeco): a child with more than three of these signs– fever and, skin rash, runny nose or red eyes, and/or mouth infection, or chest infection*

Q34-37 Sanitation and Hygiene (access and quality)

Q34 Type of toilet used by most members of the household: 1= Flush toilets 2= Improved pit latrine (VIP) 3=Traditional pit latrine/ Open pit 4=Bush ***(If Bush skip to Q36)***

Q35 Distance between toilet and water source 1=0- 30 metres 2=30 metres or more

Q36 what washing agents do you use in your household? 1=Soap 2=Shampoo 3=Ash 4=Plant extracts 5=None

Q37 How do you store prepared food? 1= Suspend in ropes/hooks 2=Put in pots beside the fire 3= Put in covered containers 4= Don't store 5= Other, specify

Q 38 Food Consumption & Dietary Diversity

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

Food group consumed: What foods groups did members of the household consume in the past 24 hours (from this time yesterday to now)? Include any snacks consumed.	Did a member of your household consume food from any these food groups in the last 24 hours**?** *1=Yes* *0=No*	**Codes:* 1= Own production 6=Borrowed 2=Purchases 7=Gathering/wild 3=Gifts from friends/families 8=Others, specify_____ 4=Food aid 9=N/A 5=Bartered
Type of food		**What is the main source of the dominant food item consumed? (Use codes above)?**
1. Cereals and cereal products *(e.g. maize, spaghetti, pasta, caanjera, bread*)?		
2. Meat, poultry, offal *(e.g. goat/camel meat, beef; chicken/poultry)?*		
3. Eggs?		
4. Roots and tubers *(e.g. potatoes, arrowroot)?*		
5. Vegetables *(e,g, green or leafy vegetables, tomatoes, carrots, onions)?*		
6. Fruits *(e.g. water melons, mangoes, grapes, bananas, lemon)*?		
7. Pulses/legumes, nuts *(e.g. beans, lentils, green grams, cowpeas)*?		
8. Milk and milk products *(e.g. goat/camel/ fermented milk, milk powder)?*		
9. Oils/fats *(e.g. cooking fat or oil, butter, ghee, margarine)?*		
10. Sugar and honey?		
11. Fish and sea foods *(e.g. fired/boiled/roasted fish, lobsters)?*		
12. Miscellaneous *(e.g. spices, chocolates, sweets, etc)?*		
Q39 In general what is the <u>main</u> source of food in household? *(*Use codes above)* _____		
Q40 Total number of food groups consumed *(filled by enumerator)***:** _____		

Q41 - 42 Informal and formal Support or Assistance in last three months *(circle all options that apply)*

Q41 Which of these informal supports did you receive within the last three months if any?

1=Zakat from better-off households 2=Remittances from Abroad 3=Remittances from within Somalia
4=Gifts 5=Loans 6=None 7= Other (specify) _____

Q42 Which of this formal international or national aid support did you receive within the last three months if any?

1= Free cash 2=Free food 3=Cash for work 4=Food for work 5=Supplementary food
6=Water subsidy 7 Transportation of animals subsidy 8=Veterinary care 9=None 10= Other (specify) _____

Appendix 3: Allula, Kandala, Iskushuban Assessment Mortality Questionnaire

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

No.	**1**: First Name	**2**: Sex *(1=M; 2=F)*	**3**: Age (yrs)	**4**: Born since **20 / 6/ 2006**	**5**: Arrived since **20 / 6/ 2006**	**6**: Reason for leaving	**7**: Cause of death
a) How many members are present in this household now? List them.							
b) How many members have left this household (out migrants) since **20 / 6/ 2006**? List them							
c) Do you have any member of the household who has died since **20 / 6/ 2006**? List them							

Codes

Reason for migration

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

Cause of death

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

Summary* * *For Supervisor Only*

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

Appendix 4. Traditional Calendar for Nutrition Survey in Allula, Kandala and Iskushuban Sep 2006

Month	2001	2002	2003	2004	2005	2006
Jan.		**56** Sidatal	**44** Sidatal	**32** Sidatal	**20** Sidatal	**8** Sidatal
Feb.		**55** Arafo Iid Al-Ad Haa	**43** Arafo Iid Al-Ad Haa	**31** Arafo	**19** Arafo	**7** Arafo (PL president visit Allula)
Mar.		**54** Sako	**42** Dago (Dagalkii Ciraq)	**30** Dago	**18** Dago (Islan M'med died)	**6** Dago (TFG settle in Baidoa)
Apr.		**53** Safar	**41** Safar	**29** Safar	**17** Safar	
May		**52** Mawliid	**40** Mawliid (Puntland Reconciliation)	**28** Mawliid	**16** Mawliid	
Jun.		**51** Rabiculakhir	**39** Rabiculakhir	**27** Rabiculakhir	**15** Rabiculakhir	
Jul.		**50** Jamadul awal	**38** Jamadul awal	**26** Jamadul awal	**14** Jamadul awal	
Aug.		**49** Jamaadul Akhir (Qayadsame fighting)	**37** Jamaadul Akhir	**25** Jamaadul Akhir (Election of Somalia president)	**13** Jamaadul Akhir	
Sep.		**48** Sabuux	**36** Sabuux	**24** Sabuux (Puntlant president election)	**12** Sabuux	
Oct.	**59** Soon Dheere (Shacbaan))	**47** Soon Dheere (Shacbaan)	**35** Soon Dheere (Shacbaan)	23 Soon Dheere (Robkii Barafle)	**11** Soon Dheere Ramadaan	
Nov.	**58** Election of Jama Ali Jama Soon Dheere (Shacbaan)	**46** Shacbaan (Ramadan)	**34** Ramadan	**22** Ramadan (Beldaje Abdillahi's death)	**10** Iid el fitr Ramadaan	
Dec.	**57** Ramadan	**45** Ramadan (Dhudo fighting)	**33** Soon fur	**21** Soon fur (Badgariir)	**9** Soon fur	

Key
Dirac
GU'
Xagaa
Deyr

Appendix 5: Team formation for the Hawd of Toghdeer Nutrition Assessment.

Team	Members	Villages	Cluster No	District
1	1. Ahmed Maxamed Xasan 2. Ahmed Waaberi Ismacil 3. Mahamed Abdi Elmi (TL) 4. Abdikarim Duale (S)	Unuun	3	Kandala
		Gurur	5	
		Xalwad	28	Allula
		Geesaley	29	
		Murcaayo	30	
2	1. Shugri Ali Muse 2. Mohamed Ali Shire 3. Hassan Ali Awed (TL) 4. Ismail Muuse Farah (S)	Iskushuban	8	Iskushuban
		Xiriro	9	
		Rako	10	
		Timirshe	14	
		Dharoor	16	
3	1. Nimo Abdullahi Ali 2. Jamaal Maxamed Khurse 3. Abdirahman Qahiye Isse (TL) 4. Mohamed Gani Hassan (S)	Qandala	1	Kandala
		Dhankadiis	2	
		Balidhidin	4	
		Turmasale	6	
		Shebab	7	
4	1. Muse Abdirahman Jama 2. Jamaal Maxamed Abdullahi 3. Seynab Said Salah (TL) 4. Maxamed Ismail Ali (S)	Bargal Town	17	Bargal
		Bargal Town	18	
		Wadi- Khayre	19	
		Muudiye	21	
		Coomaayo	22	
5	1. Muse Suleyman Abdullahi 2. Ali Mohamud Mohamed 3. Mahamud Fatah Mohamud (TL) 4. Mohamed Moalim (S)	Bareeda	23	Allula
		Barxa	24	
		Tooxin	25	
		Ximisdiyo	26	
		Hursale	27	
6	1. Saadia Xirsi Mohamed 2. Ahmed Geelle Shire 3. Abdikarim Farah Gutale (TL) 4. Qaasim Xasan Diini (S) 5. Khalif Nouh (S)	Iskorsar	11	Iskushuban
		Biyo Madoobe	12	
		Hafun	13	
		Xaadha	15	
		Cadayo	20	
	Coordination of the Assessment: 1. Tom Oguta – FSAU Nutrition Project Officer 2. Joseph Waweru – FSAU Nutrition Project Officer		All	
	Technical and managerial support: Ahono Busili – Deputy Nutrition Project Manager			

Appendix 7: Child Referral Form

REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date:_____

Name of the child:_____ Sex of child: _____

Age of child: _____ Name of caretaker: _____

Child diagnosed with (state the condition): _____

Child referred to: _____

Child referred by: _____

……

REFERRAL FORM FOR MALNOURISHED CHILDREN

Name of the village: _____ Date:_____

Name of the child:_____ Sex of child: _____

Age of child: _____ Name of caretaker: _____

Child diagnosed with (state the condition): _____

Child referred to: _____

Child referred by: _____

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