

NUTRITION SURVEY REPORT RABDURE DISTRICT

BAKOOL REGION SOMALIA

September 2002

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The comments of some members of the Nutrition Working Group, FSAU in particular on the draft report are also gratefully acknowledged.

2 EXECUTIVE SUMMARY

In September 2002, UNICEF conducted a nutrition survey in Rabdure District, Bakool Region in South and Central Somalia in collaboration with IMC, FSAU and local authorities. The survey was conducted to monitor the nutrition situation of Rabdure district and progress made by agencies' intervention since the last nutrition survey in September 2001.

The main objective of the survey was to determine the level of wasting and oedematous malnutrition among children below five years, and some possible factors that may be contributing to child malnutrition in the district.

Using a two-stage random cluster sampling methodology, a total of 907 children between age 6-59 months or measuring 65-110 cm were examined. Nutritional status assessments were based on weight and height measurements. Moreover, information relating to diarrhoea, ARI, malaria incidence two weeks prior to the survey and measles incidence one month prior to the survey, Vitamin A supplementation and measles vaccination status of the children were also collected. Qualitative information was also collected prior to the field work with some key informants and a group of mothers on issues relating to household food security and childcare practices in order to gain understanding of factors affecting nutrition in the district.

The preliminary report on anthropometric analysis, background information and qualitative information provided by the key informants were examined by UNICEF. Wasting of muscle and fat tissues, a rapid response to acute nutritional deficiency caused by infections and dietary inadequacies was found in 14.8% of children with 1.9% being severely malnourished.

Information collected on immunisation status during the survey indicated that slightly more than 80% of the children had been vaccinated against measles, out of which 73% were vaccinated within the past 6 months and 27% before the past 6 months. Almost 20% were not vaccinated at all while slightly more than 83% of the children were provided with Vitamin A supplements during the past six months. About 16% of the children had diarrhoea, 15% had ARI and 11% had malaria in two weeks prior to the survey while slightly more than 1% had measles in one month prior to the survey. Almost 90% were introduced food other than milk before four months. Twenty one percent of the children were from households headed by females. About 2% of the households were from displaced populations and almost 5% from returnee populations.

Diseases, limited access to quality water, and poor child-feeding practices seem to be contributing substantially to malnutrition in Rabdure district. Continuation of the UNICEF, IMC and WFP supplementary feeding and family rations to malnourished children and their families until proper harvest will sustain the improvements made and prevent massive displacements in the area.

A longer-term plan to improve further the nutritional status of the population needs to be developed in a multi-sectoral approach in water and environmental sanitation, promotion of early child care and introduction of small-scale business through community based action groups. The main areas of focus should include promoting exclusive breastfeeding, appropriate young child feeding, diversification of diets, improvement in household hygiene and health care practices, income generation activities, and rehabilitation of water points with the active participation of pregnant mothers, fathers and other caregivers in order to sustain improvements in the nutrition situation in Rabdure district.

3 . SUMMARY FINDINGS

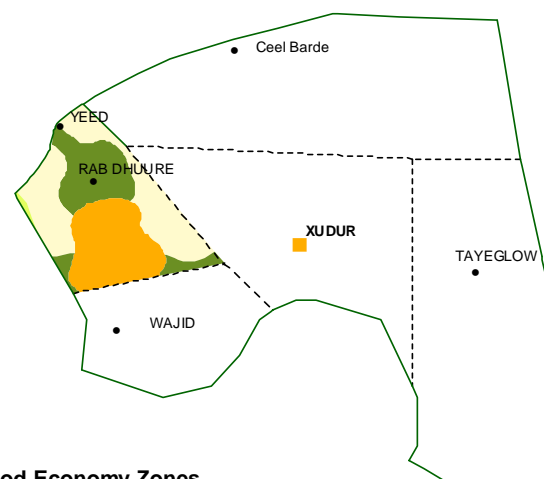
Indicator	Number	Percentage
Under five children screened during the survey.	907	100
Number of boys in the sample	484	53.4
Number of girls in the sample	423	46.6
Global acute malnutrition according to Weight For Height Index in Z-Score or presence of oedema	134	14.8
Severe acute malnutrition according to Weight For Height Index in Z-Score or presence of oedema	17	1.9
Global acute malnutrition according to Weight For Height Median or presence of oedema	81	8.9
Severe acute malnutrition according to Weight For Height in % Median or presence of oedema	13	1.4
Proportion of children with diarrhoea in two weeks prior to the survey.	143	15.8
Proportion of children with ARI in two weeks prior to the survey.	138	15.2
Proportion of children with Malaria in two weeks prior to the survey.	101	11.1
Proportion of children with Measles in one month prior to the survey.	11	1.2
Proportion of children supplemented with Vitamin A in six months prior to the survey.	754	83.1
Proportion of children immunised against Measles.	729	80.4
Proportion of children on breastfeeding	223	24.6
Proportion of children breastfed less than 6 months	24	3.5
Proportion of children breastfed 6-11 months	143	20.9
Proportion of children breastfed 12-18 months	193	28.2
Proportion of children breastfed 18 months and more	324	47.4
Proportion of children introduced food before 4 months	814	89.7
Proportion of children introduced food during 4-6 months	71	7.8
Proportion of children introduced food after 6 months of age	22	2.4
Proportion of children fed once a day	7	1
Proportion of children fed twice a day	98	11
Proportion of children fed 3-4 times a day	600	66
Proportion of children fed more than 4 times/day	202	22
Proportion of female-headed households.	107	21.3
Proportion of displaced households	10	2.0
Proportion of returnee/refugee households	23	4.6
Two main reason of displacement/returnee		
Food shortage	18	54.5
Insecurity	7	21.2
Two main source of food		
Household crop production	238	47.4
Purchases	108	21.5
Two main source of income		
Sale of crops	180	35.9

Sales of animals and animal products	150	29.9
Two main coping strategies during food shortage		
Wild food collection	125	24.9
Food aid	117	23.3
Two main source of drinking water		
Open hand dug well	317	63.3
Water pond	148	29.5
Main practice of human excreta disposal		
Bush/Open ground	434	86
Main source of treatment when a child is sick		
Private clinic and pharmacy	346	70.5
Traditional healer	112	22.8

3. INTRODUCTION

Rabdure district which is located 120km northwest of Baidoa town and 30km west of the Somali border with Ethiopia is one of the most food insecure districts in Bakool region with an estimated population of 13,000-15,000. The population can be broadly categorised into three food economy groups namely southern agro-pastoral herders, pure pastoral and agro-pastoral farmers. The headquarter town and some of the surrounding villages were completely destroyed during the inter-clan fighting that ensued after the occupation of Bay and Bakool regions by the Somali National Alliance (SNA) in 1995.

Since 2000, the district has experienced the cumulative effect of drought, poor harvest, reduced pastures and population movement causing deterioration in food security. The Deyr 2001/2002-crop failure *further suppressed* the agro-pastoral high potential farmers in areas like Quracle and Isdhowrto thus rendering the district to be more vulnerable. UN agencies and international non-governmental organisations have been providing humanitarian assistance to the population.



Food Economy Zones
Orange Bay-Bakol Agro-Pastoral: High potential sorghum, cattle, camel
Light Green Dawo Pastoral: Sheep & goats, cattle, camel
Dark Green Southern Agro-Pastoral: Camel, cattle, sorghum
Yellow Southern Inland Pastoral: Camel, sheep & goats

3.1 JUSTIFICATION OF THE NUTRITION SURVEY

Following reports of high malnutrition rates in September 2001 (19.2% GAM), interagency intervention commenced in late 2001. The food security situation continued to deteriorate with the poor performance of the deyr 2001/2002 crop. Pastures got depleted and water shortage problem escalated. However UNICEF, IMC, and WFP continued with the intervention efforts through the district MCH and the satellites sites established. Further WFP continued with the food for work activities in the district where water projects, To evaluate the intervention programme performance through quantitative means and as a means of monitoring the nutrition situation, a nutrition survey was recommended. The nutrition survey was a joint effort of UNICEF, IMC and FSAU.

3.2. SURVEY OBJECTIVES

- To determine the level of malnutrition and nutritional oedema among children aged 6-59 months or with height/length of 65-110cm in Rabdure District.
- To determine some of the possible causes of malnutrition among young children in the district
- To determine the prevalence of some common diseases (measles, diarrhoea, malaria, and ARI) in the district.
- To determine the measles vaccination and Vitamin A supplementation coverage among children in Rabdure.
- To establish baseline data for evaluating the effect on an integrated drought response strategy proposed for Bakool Region
- To assess the effects of household movement in the district on nutrition status
- To gather background information on household food sources, income and coping mechanisms.

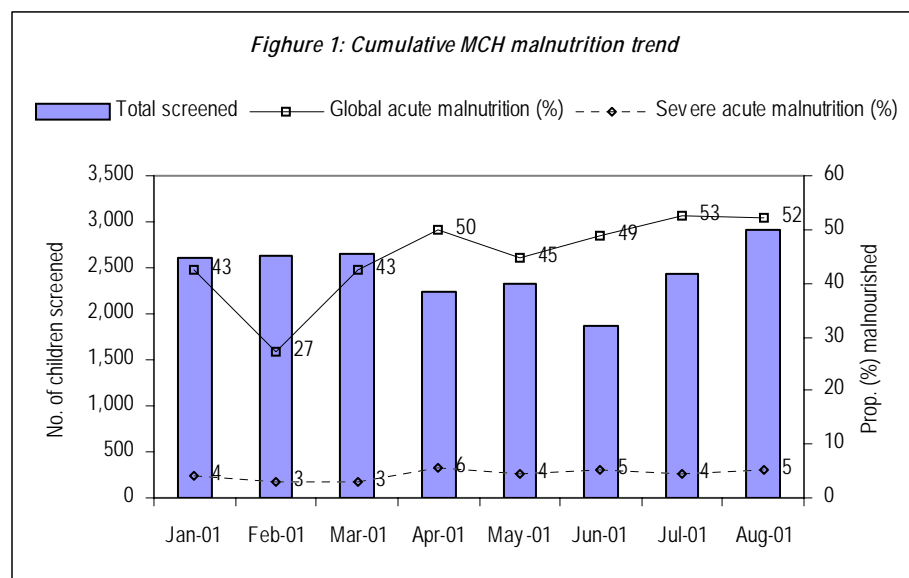
4 BACKGROUND INFORMATION

The health context

The District Health Committee established a Maternal and Child Health Centre in Rabdure town in 1999 with support from UNICEF. It is the main health facility in the entire district providing the essential package of health services for children and women. In addition to this, there are six health posts in Yeed, Quracle, Dhurey, Wabgarad,

Himilow and Boodaan villages providing basic services for treatment of common illnesses, micronutrient supplementation, supervising clean deliveries, supporting outreach immunisation activities and sensitising communities on health issues. IMC took over management of the MCH and health posts in 2000 and runs it with support from UNICEF.. Malnourished children identified through nutrition screening activities at the MCH receive systematic treatment through a dry ration supplementary feeding programme.

Despite the routine MCH Supplementary Feeding Programme (SFP) targeting malnourished children in Rabdure town and other districts in Bakool region, the general cumulative trend of proportion of screened malnourished children recorded between January to August remained alarmingly high as illustrated in Figure 1 below.



Additional pressure was felt with influx of 300 – 400 families from Ethiopia in August 2001. Of these, 70% were returnees who had migrated to the Barey and Kumbul areas of Ethiopia in the early 1990s and had been forced to return due to rising tension between them and their Ethiopian hosts. The rest came from Wajid district and surrounding villages following rumour of food distribution.

A rapid Mid Upper Arm Circumference (MUAC) assessment carried out on the 6-59 months old children from the returnee households by FSAU, IMC and the local authorities revealed a 38% acute malnutrition rate with an overall 67% of the children at risk (see Table 1). Vitamin A deficiency was also found to be prevalent as suggested by identification of 3 cases of bitot spots in children assessed. In early September 2001, WFP responded by providing a general distribution of 17 metric tons of foodstuff – maize, pulses and oil – to these families.

Table 1: Distribution according to origin and nutrition status (MUAC)

Origin	MUAC measurement					Total
	Oedema (%)	Severe acute malnutrition	Moderate acute malnutrition	At risk of malnutrition	Normal	
		<11 cm (%)	11≤ to <12.5 cm (%)	12.5 to 13.5 (%)	≥13.5 (%)	
Ethiopia Returnees	1 (0.5)	19 (8.8)	67 (31.2)	63 (29.3)	65 (30.3)	215 (87.8)
IDPs – Wajid etc	0	0	6 (20)	7 (23.3)	17 (56.7)	30 (12.2)
Total	1 (0.4)	19 (7.8)	73 (29.8)	70 (28.6)	82 (33.4)	245 (100)

3.2 Water and environmental sanitation

Access to water for human and livestock consumption has been a major problem in Rabdure district. There are 3 boreholes in the district, located in Rabdure town, Yed village and Shimbirow village, and 300 hand-dug wells in various locations. Although the town borehole can be rehabilitated, the high salinity and turbidity, as well as underground contamination make it unfit for human and animal consumption.

Majority of the hand-dug wells are located on limestone depressions and seasonal rainwater stagnation areas, with an average depth of 11m and average water column of 2.5m in the rainy season, and 1m in the dry season. Dug wells are usually lined with traditional timber logs, their mouths being level with the ground or sometimes below it, making them prone to contamination from animal wastes and surface run offs.

UNICEF supported the rehabilitation of some 33 shallow wells in Rabdure district but the endeavour has not solved the district's chronic problem of water shortage. The water table has been receding season after season, drying up a great number of shallow wells and contributing to deterioration of the already bad water quality. The underground contamination and lethal mineral content of shallow wells in the dry seasons, as well as the accumulation of deadly biogas resulting from the decomposition of animal wastes, are well known causes of animal and even human deaths. The community's seasonal de-silting and maintenance efforts have not matched the speed at which the water level is going down.

Failure in the Gu and Deyr rainfalls of 2001 added to the patchy 2002 Gu rainfall badly affected pastoralists and farmers in Rabdure district. Water shortage was experienced both for human and livestock consumption. Livestock conditions, mainly cattle and goat deteriorated with consequent reduction in their milk production and marketability. Populations were forced to migrate to water catchments within the district, while the agropastoral and pure pastoral population moved with their livestock in search of water especially towards Garasweyne, 45km Northwest of Hoddur town.

3.3 Food Security Context

Main events affecting food security in Rabdure District

Period	Major event
June 2002	Lack of rain continuity resulting to wilting of the sorghum crop before maturation.
April 2002	Timely onset of <i>Gu</i> rains in most parts of the district
March 2002	Significant reduction of household cereal stocks
Feb 2002	Increased milk prices due to scarcity as pastures reduce
Jan 2002	Total Deyr crop failure in most parts of Rabdure. A significant population proportion estimated to have a substantial food deficit of 15-30% over the year (FSAU, March 2002).
Sept/Oct 2001	Commencement of UNICEF/WFP sponsored SFP/family rations distribution through Rabdure MCH and Bodan and Isdowrto outreach sites. Intensification of food for work programmes. Rabdure District survey by UNICEF (19.3% <-2 z-score/oedema and 2.6% <-3 Z-score/oedema)
August 2001	Poor <i>Gu</i> crop harvest (whole of Bakool Region). High cereal prices due to shortage and inflation. Serious water shortage in Rabdure District and the neighbouring district. Pastoralists from Rabdure move to Elberde-Ethiopian belt with their livestock IDPs increased significantly in Rabdure town. A nutrition assessment in August 2001 recorded 38% malnutrition using MUAC among the IDP population in Rabdure (FSAU August 2001)
April/May 2001	Trickling in of IDPs from Ethiopia to Rabdure
August 2000	IMC survey in Elberde and Rabdure Districts recorded a 13.7% global malnutrition and 3.8% severe Good <i>Gu</i> harvest. Pasture and water available though a few pockets in the districts experiencing shortage
April-June 2000	Relatively good <i>Gu</i> rains boosting the food security of Bakool residents. Pasture and milk making available.

	Water is available for both human and animal consumption.
March 2000	Supplementary feeding programmes through the MCH targeting malnourished children commences
Feb 2000	Rabdure town survey by UNICEF(30% <-2 z-score/oedema and 3% <-3 Z-score/oedema
Jan/Feb 2000	Crop failure and poor livestock condition
Oct/Nov 1999	Poor Deyr rains leading population movements in search of water and pasture in other areas including Ethiopia.
Oct 1999	District taken over by Rahanwein Resistance Army- improvement of security
Oct '97-Feb 1998	El-nino rains leading to outbreak livestock disease particularly to camels
June 1994	Rabdure District survey by UNICEF recorded 21.3% global malnutrition rate using the percentage of the median (<80%/oedema) as the reference cut-offs

Sources: Extracted from previous FSAU food security assessment and UNICEF reports.

Current food security situation

Following short Gu 2002 rains, sorghum crop in most areas never got to maturity while pasture and water scarcity started being experienced by mid August. As a result livestock started moving within the region in search of pasture and water, particularly towards Leg-gale area (Garaswein area) and Quracle area. The Leg-gale area hosted a lot of livestock leading to fast depletion of pastures. Due to lack of quality pasture the livestock milk production declined thus affecting prices upwards, where available. During the last week of August the milk prices were as high as 8,000Ssh/litre up from normal price of 2-3,000Ssh/litre. Livestock are also currently far from the households implying limited milk availability and access to the households.

Some areas are experiencing severe water shortage making some households to shift; for example; Sedahburot, Warbarbar and Iskri. Many catchments are dry forcing long distant travelling in search of water for both livestock and domestic purposes.

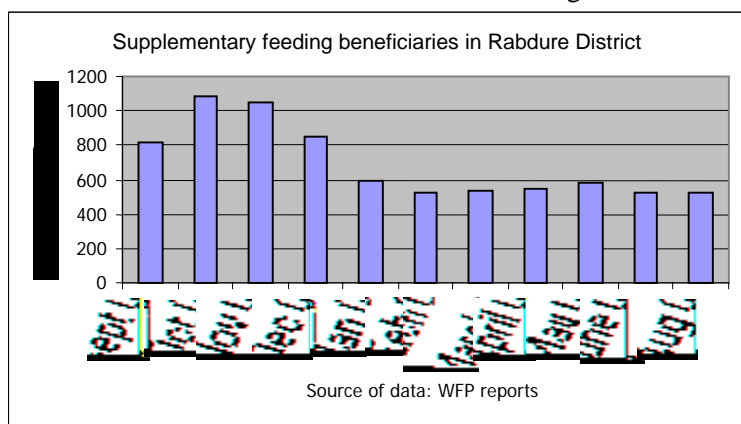
Income opportunities among the Rabdure residents have been limited to sale of livestock among the better-off groups as the poor collect bush product for sale in Rabdure town. Search for casual labour is also common among the poor in their effort to cope with stress. Generally the poor crop performance has greatly reduced income level for the agro-pastoral community thus compromising their food access capacity. The status of the low incomes is exacerbated by increased cereal prices thus further affecting the poor. Due to low sorghum production in the area the cereal prices are relatively high (120,000Ssh/50kg sorghum compared to 90,000Ssh normal price). This implies limiting food access, particularly to the poor who have few or no livestock to exchange for cereals. The poor adopted movement or migration to urban areas or large villages in search of employment as a coping strategy during stress

However, the on-going UNICEF/WFP sponsored SFP/family ration has greatly contributed to the food gap in the targeted households.

Inter-agency nutrition intervention

UNICEF, WFP and IMC embarked on intense field activities providing supplementary food and family ration to families with malnourished children. The extended and expanded supplementary feeding approach adopted reduced distance covered by the mothers/caretakers to access both nutrition and health services. In the beginning, there was an overwhelming increase in caseloads at the Huddur and Rabdure MCHs with beneficiaries coming from as far as 40-60 Km away. The beneficiaries were required to walk 3-4 times per month for EPI, screening, supermix distribution and WFP's family ration sessions. MCH staffs were predominantly preoccupied with supplementary feeding activities leaving them with little or no time for routine MCH service. The Rabdure programme involves provision of supplementary food and systematic treatment to the moderately malnourished children at both the MCH and newly established outreach sites (which also serve as health posts at regular days). The two sites located in Isdhowrto and Bodan villages serve the rural population while the Rabdure MCH serves the Rabdure town population as well as the immediate surrounding villages. Each of the moderately malnourished child identified receives a monthly ration consisting of about 100 kg of maize, 10kg of pulses, 3.6kg of oil and 10kg unimix. The unimix is meant for the child while the rest is meant for use by the family.

As indicated in the graph, the moderately malnourished children in the programme declined from about 1000 in October and November 2001 to about 500 in August 2002.



The severely malnourished children identified are usually referred to the MSF-Belgium sponsored therapeutic feeding centre for specialised treatment and feeding in Huddur. The families from which the severely malnourished children come also receive family ration from WFP.

FFW activities by WFP have continued with significant project being carried out since September 2001. About 200 huts have been constructed, 10 water catchments rehabilitated and several roads rehabilitated.

Keys results of the Oct 2001 nutrition survey

The global acute malnutrition rate was 19.2% with 2.6% of the children being severely malnourished. Children aged 6-23 months were more likely to be malnourished compared to the 24-59 month age group. Morbidity prevalence based on a 2-week recall period was 26.6% for diarrhoea, 18.6% for malaria, and 15.6% for acute respiratory tract infections. Children who had suffered from malaria and diarrhoea were significantly more likely to be malnourished. The 6-23 month age group who had diarrhoea were more likely to be malnourished than the 24-59 months old age cohort. However, those 6-23 month old who were breastfeeding were less likely to be malnourished.

4. METHODOLOGY

4.1 Sample size

The target population was children 6-59 months (or heights between 65cm and 110cm). In order to provide valid estimates of the prevalence of malnutrition in children with a 95% confidence, a minimum of 900 children were to be examined 30 children to be randomly selected from each of 30 clusters.

4.2 Sampling methodology

A two-stage cluster sampling methodology was used. A list of villages with population estimates for all villages in Rabdure district was obtained from the NIDs Secretariat in South and Central Zone of Somalia and confirmed by the community leaders. A table of cumulative population and attributed numbers was developed, and clusters selected based on population proportional to size. The sampling interval was determined by dividing the total population by 30. The calculated cluster interval was 433. (*See Annex: 1*). A random number selected within the cluster interval (378) was used to determine the location of the first cluster. The next and subsequent clusters were determined by adding the cluster interval to the preceding random number selected. A total of 7 clusters were from urban settlements and 23 clusters were from villages.

The second stage of sampling was carried out in the cluster to select the first and subsequent households. With the help of survey guides selected by the local authorities, each team went to the middle of the cluster assigned and determined a random direction by spinning a pencil. All households along the direction selected to the border of the cluster were counted and assigned numbers on a piece of paper. The survey guide randomly selected the first household to be visited from among those numbers. If the household had an under-five child, interview continued. If the household did not have an under-five child, teams moved to the next household in the same direction until they found a household with an under-five child. Subsequent households were selected on the basis of proximity

following a clockwise direction. All eligible children in each household visited were measured and weighed. If a caregiver or child was absent an appointment was made, and the household revisited to examine the child before leaving the cluster. The missing children were noted in the survey form though no other child specific details were collected.

A total of 907 children were examined for weight for height. Their caregivers were interviewed as to whether the children had received Vitamin A or Measles vaccination in the past 6 months, or had suffered from diarrhoea or ARI diseases two weeks prior to the survey.

Five teams were used to collect the data. Each team had two enumerators, one supervisor and a survey guide. Enumerators were selected based on their experience with previous nutrition surveys. IMC and local authority in Rabdure district assisted in the identification of qualified persons. They were given a three-day training in anthropometric techniques, sampling techniques and how to complete survey questionnaires including one day of field practice in a village near Rabdure town (the selected village was not one of the villages selected for the survey).

Additional qualitative information was collected using focus group discussions and key informants interviews.

4.3 Variables examined

Age – Only children between 6-59 months or whose length/height is 65-110cm were selected for examination. The age of a child was determined from the mother/caregiver's recall, the under fives growth monitoring card, or from a local events calendar (*See Annex 2*) in instances where date of birth was not stated.

Weight – UNICEFF electronic scales were used to weigh children to the nearest 0.1 kg or 100g.

Height – Children were measured barefooted and bareheaded using height measuring boards graduated to the nearest 0.5cm. Children with height < 85 cm were measured lying, while those equal to or >85 cm were measured standing.

Oedema – Children were examined for the presence of bilateral pedal oedema. The occurrence of pitting as a result of thumb pressure on the foot or leg for 3 seconds was indicative of nutritional oedema.

Diarrhoea – Mothers/caregivers were interviewed regarding any episode of three or more loose, watery stools in a day, within the preceding two weeks.

Acute Respiratory Infections (ARI) – collected from interviewing the mother/caregiver whether the child had “*oof wareen or wareento*” (local term of pneumonia) two weeks prior to the survey. This term was validated by further asking if the child had cough, fever and rapid breathing.

Malaria– collected from interviewing the mother/caregiver whether the child had malaria two weeks prior to the survey.

Measles immunisation status – the information was either provided by the mother or recorded from the child's vaccination card.

Measles prevalence– the information was collected by asking the mother/caregiver whether the child had measles in one-month period prior to the survey.

Vitamin A supplementation - the information was collected from interviewing the mother or recorded from the child's vaccination card.

Residential status – In all households visited, the mother/caregiver was asked whether they were originally resident from the village/town, or if they were displaced from elsewhere.

Sex of household head – The mother/caregiver was asked to state the sex of the person who makes decisions regarding welfare of all household members.

Feeding – Introduction of breastfeeding and weaning practices and times feed to children was assessed by interviewing mother/caregiver to all children.

Public health facilities- health facilities offering free health assistance and usually sponsored by humanitarian organisations

4.4 Indicators and cut-offs

Weight for height - expressed in Z score - is the most appropriate indicator for quantifying wasting in a population during an emergency. However, the two modes of expression in the table below were used for presentation of results.

Nutritional status	Weight for Height in Z-score	Weight for Height in % of Median
Global acute malnutrition	< -2 or oedema	< 80% or oedema
Severe acute malnutrition	< -3 or oedema	< 70% or oedema

4.5 Data preparation and analysis

During the data collection phase, each questionnaire was thoroughly checked by the field supervisors for omissions, inappropriate responses and for unlikely weight for height measurements. Survey Co-ordinator travelled to enumeration areas making spot checks and ensuring that the methodology was standardised.

Pre-coded responses were entered into the EPI Info version 6-software programme for data analysis. Confidence intervals were used to test for significant differences between prevalence of malnutrition among different age and food economy groups.

5. PRESENTATION OF THE SURVEY RESULTS

The 907 children surveyed were from 502 households. About 21% of the visited households were female headed while the rest were male headed.

5.1 Age and gender distribution of children surveyed

The summary of the surveyed children categorised by age and gender is as presented in Table 1. Information on actual demographic patterns by year is not available for Somalia. Out of 907 children examined during the survey, 484 (53%) were boys and 423 (47%) were girls, with a sex ratio of 1.1. The ratio of males to females for the 6-11 gae category was lowest with the ratio progressively increasing as the age advanced. Interestingly there were slightly more males than females in this survey sample although the difference was statistically insignificant.

Table 1: Distribution of sample by age and sex in Rabdure district September 2002

Age in months	Boys		Girls		Total		Sex ratio
	No.	%	No.	%	No.	%	
6 – 11	38	42	53	58	91	10	0.7
12 – 23	91	51	87	49	178	20	1.0
24– 35	112	52	102	48	214	23	1.1
36– 47	105	56	84	44	189	21	1.3
48– 59	138	59	97	41	235	26	1.4
Total	484	53	423	47	907	100	1.1

5.2 Anthropometric analysis

The results of anthropometric analysis were obtained by using weight for height expressed in Z-score and percentage of the median of the reference population.

Table 2: Distribution of children by nutritional status, based on Z-score categories in Rabdure district September 2002

Age	6-59 months		6-36 months	
	Proportion	No	Proportion	No
Global acute malnutrition	14.8% (95% CI: 11.9% - 18.3)	134	13.9% (95% CI: 11.6% - 18.5%)	78
Severe acute malnutrition	1.9% (95% CI: 1.1% - 3.0%)	17	1.4% (95% CI: 0.7% - 2.9%)	8
Oedema	0.2%	2	0.2%	2

About 14.8% of the surveyed children were malnourished, using <-2 Z-score or oedema cut-off while 1.9% of the surveyed children were severely malnourished, using <-3 Z-score or oedema cut-off. About 12.9% of the children were moderately malnourished. There were 2 oedema cases which both were less than 3 years of age..

Table 3: Distribution of children by nutritional status, based on percentage of the Median categories in Rabdure district September 2002

Age	6-59 months		6-36 months	
	Proportion	No	Proportion	No
Global acute malnutrition	8.9% (95% CI: 6.7% - 12.0%)	81	8.9% (95% CI: 6.2% - 13.0%)	50
Severe acute malnutrition	1.4% (95% CI: 0.8% - 2.5%)	13	1.4% (95% CI: 0.7% - 2.9%)	8
Oedema	0.2	2	0.2	2

Based on percentage of the median, 8.9% of the surveyed children were malnourished (w/h<80% of the median or oedema) while 1.4% of the children were severely malnourished (using <70% of median or oedema cut offs). There

was no significant difference between the prevalence of malnutrition in children aged 6-36 months and those aged 6-59 months.

Table 4: Distribution of children by nutrition status and age in, Rabdure district, September 2002

Age group Months	Total children	≥ -2 Z-score		< -2 and ≥ -3 Z-score or oedema		< -3 Z-score or oedema	
	Number	No.	%	No.	%	No.	%
6 – 11	91	84	92	5	6	2	2
12 – 23	178	144	81	31	17	3	2
24– 35	214	185	86.5	26	12	3	1.5
36– 47	189	163	86	23	12	4	2
48– 59	235	198	84	32	14	5	2
Total	907	773	85.2	117	12.9	17	1.9

The 12-23 age category was recorded to have the highest malnutrition (19%) within the age categories

Table 5: Distribution of children by common disease prevalence, measles vaccination and Vitamin A supplementation status , Rabdure district in September 2002

Age group Months	Total	Diarrhoea in last two weeks		ARI in last two weeks		Malaria in last two weeks		Measles cases in last one month		Measles vaccinations		Vit A Supplementati on in last 6 months	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
6 – 11	91	13	14	12	13	8	9	2	2	50	55	70	77
12 – 23	178	49	28	33	19	22	12	3	2	135	76	146	82
24– 35	214	45	21	39	18	34	16	4	2	178	83	181	85
36– 47	189	24	13	31	16	22	12	2	1	166	88	160	85
48– 59	235	12	5	23	10	15	6	0	3	200	85	197	84
Total	907	143	16	138	15	101	11	11	1.2	729	80	754	83

The overall incidence of diarrhoea, ARI and malaria among under-fives was 16%, 15% and 11% respectively with slightly high episodes observed in the first three years of age. A total of 22%, 25% and 16% of the malnourished children had diarrhoea, ARI and malaria respectively. ARI ($p < 0.05$), malaria ($p = 0.03$) and diarrhoea ($p = 0.04$) was found to be significantly associated with wasting in children. The survey also revealed that diarrhoea was significantly associated to children age category with those likely to be breastfeeding (6-23months) being at higher risk of diarrhoea ($p < 0.05$). This is supported by qualitative information revealing immediate introduction of food other than breast milk after birth. There were more cases of diarrhoea in the 12-23 and 24-35 age categories than in the other age categories.

Six months prior to the survey, measles immunisation coverage was 80% while 83% of the surveyed children had received Vitamin A supplementation over the same period.

Table 6: Social economic characteristics of the Rabdure population

Sex of Household Head	Total	Percentage
Female headed households	107	21
Male headed households	395	79
Total	502	100
Residential Status of households		
Indigenous residents	469	93
Returnees	23	5
Displaced	10	2
Total	502	100
Two main reason of displacement/returnee		
Food shortage	18	54.5
Insecurity	7	21.2
Two main source of food		
Household crop production	238	47.4
Purchases	108	21.5
Two main source of income		
Sale of crops	180	35.9
Sales of animals and animal products	150	29.9
Two main coping strategies during food shortage		
Wild food collection	125	24.9
Food aid	117	23.3
Two main source of drinking water		
Open hand dug well	317	63.3
Water pond	148	29.5
Main practice of human excreta disposal		
Bush/Open ground	434	86
Main source of treatment when a child is sick		
Public facility	346	70.5
Traditional healer	112	22.8

With regard to seeking health assistance, most of the children are taken to public health facilities that are sponsored by International Medical Corps, when sick. The data indicated that majority of the households did not have access to toilet facility.

Most of the households included in the survey were located in their original place of residence with only 5% and 2% being returnees and internally IDP respectively. Food shortage and insecurity are the main factors attributed to population movement.

According to data in Table 6, sale of crops and sale of animals as well as their products are the main income sources for the households in Rabdure. With regard to food sources, household crop production and food purchases were the main food sources. The commonly purchased food items include sorghum, sugar, milk, meat, oil, ghee, wheat flour, rice and beans in normal situation while during crisis sorghum, sugar and wheat flour are prioritised. Dependency on wild food (dik dik) and relief food distributed through the ongoing interventions are the main coping strategies currently employed by the Rabdure residents. Qualitative information further indicate that in times of severe food shortage wild food collection is one of the main strategy of coping in Rabdure. Some households reduce the quantity per serving and number of meals consumed.

An in-depth analysis between global acute malnutrition and variables like food source, income source, and source of drinking water indicate no direct relationship. However, it was found that children whose households income source is casual labour and salaried employment are more likely to be malnourished compared with other sources.

Survey data revealed hand dug wells and water catchments/ponds as the main sources of water in Rabdure with about 63% and 30% of the households respectively depending on them.

5.3 Childcare aspects influencing nutritional status of children

The survey revealed that about 4% of surveyed children were breastfed less than 6 months, 21% were breastfed between 6-11 months, slightly more than 28% are breastfed between 12-18 months while the rest 47% were breastfed more than 18 months. Almost 90% of the children were introduced foods other than breast milk before 4 months of age, 8% were weaned at age 4-6 months while slightly more than 2% were weaned after 6 months. Less than 1% of children are fed once a day, 11% are fed twice a day while the other 88% are fed three and more times a day.

Additional information collected through Focus Group Discussions with women groups and caretakers indicate that most of the mothers introduce to their babies water with sugar immediately after birth. During breastfeeding period, mothers breastfeed 6-8 times /day, (5 times between morning and night and 3 times in the night) unless the mother becomes pregnant or sick. Usually, breastfeeding continues up to 24 months unless on special circumstances when breastfeeding stops (mother's pregnancy and/or sickness). In the case when the mother is away, elder sister or grand mother feed babies with whatever is available (milk, porridge, tea with milk or sugar solution) with a cup or traditional bowl. Mothers and elder sister usually assist young children (less than three years) in the feeding.

Sometimes food preparation is done under poor unhygienic condition mainly due to lack of water and/ or simply the caretaker/mother not being sensitive on cleanliness. Through focus group discussion it was revealed that sorghum porridge is usually prepared for infants and is given with a cup or some times with spoon. Infants are given between 1/8 - 1/4 of a litre of porridge at one feed with a cup for 3-4 times/ day or on child's demand. The ingredients and composition of the porridge depends on the household income and purchasing power, with the poor households inclining to give less dense food. Normally, the porridge consists of sorghum flour with any one of the following items, sesame oil, vegetable oil, sugar or milk. Over the past few months, the porridge consumed mainly consists of sorghum flour with milk only and sometimes without milk. It was reported also that there is tendency of holding back food when children are sick and presenting them late at the health facility when home remedies have failed.

Normally, families consume three meals unlike in stress period when they get one or two meals a day. Families eat sorghum, meat and milk in a normal day and in case of stressful situation, sorghum and meat or sorghum and milk, if milk and meat are available and affordable. Wild food, dik dik and some wild fruit in particular, is consumed during stress period.

Additional qualitative information on childcare indicated that most of mothers/caretakers do not have enough time to devote to their children due to their involvement in household income activities as well as household chores. Some mothers are the breadwinners of the households besides fetching water, fire wood and cooking food etc. The mothers/ caretakers are sometimes fatigued leading to less attention to their children. Sometimes childcare is delegated to siblings in the absence of the caretaker/mother.

During pregnancy, mothers avoid consumption of some foodstuffs as they prefer others. Women reported reduced consumption of liver and milk during pregnancy to control foetal growth¹. When breastfeeding, mothers consume more and prefer better quality food (liver and milk) if they can afford. In case of sickness mothers prefer soft food. Mothers have limited access to information on good childcare practices, much of which is given at the limited health facilities. Beside access problem, it was reported that mothers are expected to get consent from their husbands before seeking medical assistance.

Regarding intra household childcare aspects, there is no sex bias rather priority is given to the youngest children at the time of feeding and attention.

¹ Birth of large babies is reported to contribute to difficulties during delivery, particularly in the light of limited quality gynaecological services available in most parts of Somalia.

6. ANALYSIS OF FINDINGS

6.1 Nutrition status improves with consorted humanitarian response

The prevalence of total/global acute malnutrition among children in Rabdure district (14.8%) was an unacceptably high. However, the survey result depicts an improvement of nutritional situation in Rabdure with a noticeable drop from 19.2% in October 2001 to 14.8% in global acute malnutrition. A similar drop was also realized in severe acute malnutrition² i.e. 1.9% down from 2.9% in October 2001. The drop is partly attributed to the impact of the on-going humanitarian interventions and partly to the short-lived improvement in food security during May and June 2002 (following some Gu rains). The humanitarian interventions improved access to food among vulnerable households as well as improving the population's access to essential health services. The water and pasture situation slightly improved during the Gu season. It is notable that before the commencement of the current interventions, the food security indicators showed significant deterioration. The Gu 2001 rains were very low resulting to poor harvest/near total crop failure in the district. There was also reduced pasture and severe water shortage that had caused outward livestock movement. In addition, was the arrival of internally displaced persons from Ethiopia between May and July 2001 that added strain on the population that was depending on limited resources and experienced food shortage. The poor nutritional situation documented in October 2001 (global acute malnutrition of 19.2%) was mainly attributed to food insecurity. This triggered the ongoing response by the humanitarian organisation. The interventions countered among others, the challenges of reduced food access and availability and erratic food prices.

Besides providing ration for malnourished children's families, WFP also supported food for work activities that included, among other things, construction of SFP MCH outreach sites, support to 4 SFP women groups who were implementing partners, rehabilitation of water catchment areas, pit latrine construction and agriculture related activities. This implicitly gave a boost to the general welfare of the Rabdure population.

Regarding relationship between malnutrition and social economic variables, there was no significant relationship in almost all the factors with malnutrition.. However, it was found that children whose income is from casual labour and salaried employment are more likely to be malnourished compared with other sources. This could probably be due to compromised childcare. The current food security indications look bleak with recent outward movement of livestock from the district, following reduced pasture and water availability in most parts. Milk prices are on the increase implying milk access to the poor getting lower. The crop prospects are poor leading to a rise in cereal prices available in the district. Based on this, reliance on the current coping strategies, wild food collection and food aid, may persist.

6.2 Morbidity aspects and the health seeking behaviour

A total of 22%, 25% and 16% of the malnourished children had diarrhoea, ARI and malaria respectively. ARI ($p<0.05$), malaria ($p=0.03$) and diarrhoea ($p=0.04$) were found to be significantly associated with wasting in children. The survey also revealed that diarrhoea was significantly associated to children age categories with those likely to be breastfeeding (between 6-23months) ($p<0.05$) being likely to have diarrhoea. This could probably have resulted from immediate introduction of food other than breast milk after birth. This is also the crawling age at which children get in touch with dirt. Of those children with diarrhoea, malaria and ARI, 83%, 70% and 71% were less than 36 months. Diseases seem to suppress the immunity of the children in Rabdure therefore putting them at risk of malnutrition. Diseases usually lead to increased nutritional demands to make up for the tissue breakdown. Also poor childcare practices (introduction of weaning foods) have been identified to contribute to diseases and possibly to malnutrition.

The high measles immunisation coverage (80%) and Vitamin A supplementation (83%) is a positive indication of a boost to the Rabdure children's immunity. Further about 73% of the children were vaccinated against measles in

² Severe acute malnutrition based on <-2 z score or oedema cut off level

last six months (recent past). The high vaccination and immunisation coverage could be attributed the ongoing health interventions and the regular WHO anti-polio campaigns.

Though high, the prevalences of various diseases were lower than those reported in the Oct 2001 survey report. For example, about 27% of the children surveyed in Oct 2001 had diarrhoea two weeks prior to the survey, 16% had ARI, 19% had malaria and 3% had measles a month prior to the survey. In the August 2002 survey report, about 16% of the children had diarrhoea, 15% had ARI, 11% had malaria and about 1.2% had measles. The relative decline in the disease prevalence is a positive aspect that could have contributed to the drop in the current rate of malnutrition (August 2002 survey).

Public health facility and traditional healer seem to be major sources of health services when a child is sick in Rabdure district with almost 71% and 23% respectively. However, distance could be limiting utilisation of the health facility. The availability of only one MCH in Rabdure town and six health posts that are located in main villages calls for long distance trekking of health service seekers. In effect some people do not access the services. Inadequate access to safe water and poor human excreta disposal remain a major concern in Rabdure district. About 69% and 23% of the visited households use open hand dug wells and water pond/catchment as the main water source respectively.

A total of 86% out of 502 respondents use bush/open ground for defecation, an indication of poor sanitary condition especially during wet weather. Of the 14% that use latrines, 36% were observed dirty and in bad condition. In rural village, children defecate around their settlement and water catchments. This implies need for community sensitisation on proper hygiene and environmental sanitation practices.

6.3. Childcare practices as it influences nutrition status of the Rabdure District.

Exclusive breastfeeding and sound complementary feeding practices are crucial for enhancing the nutritional and health status of infants and young children. Unfortunately, a large proportion of children surveyed (90%) in Rabdure were introduced to foods other than breast milk before four months while about 25% of the children were breastfed for less than a year. This is a major impediment to optimal growth for children in Rabdure. In addition, feeding young children less dense food and limited in diversity reduces energy and other nutrients availability and access to the young children. The unhygienic conditions under which the foods are sometimes prepared exposes food to contamination and may predispose children to risk of diarrhoea episodes and finally reduced resistance to other common infections. It was notable that about 28% of children between 12 and 23 months had diarrhoea two weeks prior to the survey. It is not surprising therefore that high malnutrition (19%) were recorded among children aged 12-23 months.

Some feeding habits among expectant mothers limit consumption thus increasing chances of delivery of low birth weights.

Through the ongoing health and nutrition intervention activities coupled with the WHO's anti-Polio campaigns, the Vitamin A coverage has tremendously improved on comparison with the previous survey results. About 83% of the surveyed children had received Vitamin a supplementation six months prior to the survey up from 66% coverage recorded in October 2001. Measles immunisation coverage had also improved from 66% (Oct 2001) to 80% (Aug 2002). Though the immunisation and supplementation coverage improved, diseases continue to hamper children's proper growth hence continued recording of unacceptable levels of malnutrition (14.8%). The practice of holding back food when children are sick and the tendency to present sick children to the health facility when home remedies fail is likely to have negative effects on child's well being. The bureaucracy within households (particularly in light of 79% of the households being male headed) for a decision to be made on seeking health services also limits fast seeking of help, further advancing possibility of health status deterioration for the mothers and for children.

Regarding feeding the food variety accessible to the children is limited to sorghum porridge and milk which is not usually regular. The diet consumed by children at age twelve months is monotonous and mainly dictated by local

availability and price of foods in the market. About 88% of the children are fed more than two meals in a day. Meals for the adults mainly consist of sorghum or maize and meat.

Additional qualitative information collected indicated that most of mothers do not have enough time to devote to their children because mostly mothers are the breadwinners of the households besides fetching water, fire wood collection and cooking food etc. This has likely consequence of compromised childcare.

On overall the nutrition situation in Rabdure has improved. However, the current malnutrition rates indicate fragility of the situation that has been improved by UNICEF/IMC/WFP interventions since the end of 2001. The problems of food availability and access faced by poor households combined with the high incidence of diseases, poor sanitary practices and limited access to safe water are factors contributing to the high malnutrition rates. These problems must be urgently addressed to sustain the progress and prevent further nutritional situation deterioration.

7 RECOMMENDATIONS

Recommendations to alleviate the immediate causes of malnutrition such as diseases and inadequate dietary intake are important and urgent in the light of the global acute malnutrition in Rabdure district.

- Continuation of UNICEF/IMC and WFP intervention in SFP and family food ration to malnourished children until support systems are put in place to prevent a deterioration of the situation.
- Need to consider strategy of distributing general rations to increase access to food and prevent displacements until good harvest.
- Continuation of WFP food for work to complement food shortage in the area until good harvest.
- To address the issues of limited access to water and need for other sectors including Water & Environmental Sanitation, Agricultural and Veterinary sectors to take a more proactive role in addressing malnutrition.
- To initiate income generating activities to improve the socio-economic situation of Rabdure district by introduce small-scale credit system.
- To continue the supportive supervisory visits to outreach feeding programme and feeding centres in Rabdure district to monitor progress.
- Intensifying health and nutrition education activities at the household level to address care concerns, targeting mothers, fathers and other caregivers. The main areas of focus should include promoting exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvements in household hygiene and health care practices. Also continued support of primary health care is crucial.

REFERENCES

FSAU Monthly Food Security Report, 2002

FSAU Nutrition Update Report, 2002 and 2001

Maxwell, S. & Frankenberger, T. R. (1992) Household Food Security: Concepts, Indicators, Measurements New York and Rome UNICEF/IFAD

SACB/Nutrition Working Group 1999, Nutrition Survey, Recommendations for Somalia

UNICEF, 1990. Strategy for Improved Nutrition of Children and Women in Developing Countries
New York: UNICEF

UNICEF Somalia, 1998, Children and Women in Somalia, A Situation Analysis

WHO Regional Office for the Eastern Mediterranean, 1995 Field Guide on Rapid Nutritional Assessments in Emergencies.

ANNEX:1 Estimated population, cumulative and total clusters.

NAME	Estimated Populations	Cumulative Populations	Total clusters
Arunlei	300	300	
Lahelo	300	600	1
Imilka	600	1200	2
Guubey	400	1600	3
Rab Dhuure	2400	4000	4, 5,6, 7, 8, 9
Quracle	400	4400	10
Maduul	200	4600	
Dhurey	300	4900	11
Yeed	400	5300	12
Riiga	200	5500	
Lawareegow	300	5800	13
Haboow	300	6100	14
Dambas / Daremaley	200	6300	
Waabgarad	300	6600	15
Raxale	300	6900	16
Caatow	400	7300	17
Dhoobaale	300	7600	
Hurre	300	7900	18
Boodaan	500	8400	19
Warsankoor/Warxajin	400	8800	20
Wardhujiiley	680	9480	21, 22
Koronkoo	120	9600	
Isdhowrto	400	10000	23
Wartiriibka	200	10200	
Sadexbuurood	200	10400	24
Warxinshile	300	10700	
Warbarbaar	200	10900	25
Banaaneey	200	11100	
Lagalaay	200	11300	26
Cimilow	400	11700	27
Doonful	200	11900	
Bakal	300	12200	28
Biyocadoweyn	200	12400	
Iskiri	300	12700	29
Lowijiiley	100	12800	
Wargomoro	200	13000	30
Total	13000		

Sampling Interval
Random selection

433
378

TRADITIONAL CALENDAR FOR NUTRITION SURVEY IN RABDURE DISTRICT

ANNEX:2

Month	Events	1997	1998	1999	2000	2001	2002
Jan.	Beginning of Jiilal		55 Soonfur	43 Soonfur	31 Soonfur	19 Soonfur	7 Soonfur
Feb.	Mid of Jiilal		54 Siditaal	42 Siditaal	30 Siditaal	18 Siditaal	6 Siditaal
Mar.	End of Jiilal		53 Arafo/Dul-Xaj	41 Arafo/Dul-Xaj	29 Arafo/Dul-Xaj	17 Arafo/Dul-Xaj	5 Arafo/Dul-Xaj
Apr.	Beginning of Gu'		52 Sako	40 Sako	28 Sako	16 Sako	4 Sako
May	Mid of Gu'		51 Safar	39 Safar	27 Safar	15 Safar	3 Safar
Jun.	End of Gu'		50 Mawliid	38 Mawliid	26 Mawliid	14 Mawliid	2 Mawliid
Jul.	Beginning of Xagaa		49 Malmadoone	37 Malmadoone	25 Malmadoone	13 Malmadoone	1 Malmadoone
Aug.	Mid of Xagaa		48 Jamadul-Awal	36 Jamadul-Awal	24 Jamadul-Awal	12 Jamadul-Awal	
Sep.	End of Xagaa	59 Jamadul-Akhir	47 Jamadul-Akhir	35 Jamadul-Akhir	23 Jamadul-Akhir	11 Jamadul-Akhir	
Oct.	Beginning of Deyr	58 Rajab	46 Rajab	34 Rajab	22 Rajab	10 Rajab	
Nov.	Mid of Deyr	57 Shacbaan	45 Shacbaan	33 Shacbaan	21 Shacbaan	9 Shacbaan	
Dec.	End of Deyr	56 Ramadan	44 Ramadan	32 Ramadan	20 Ramadan	8 Ramadan	

Jiilal

GU'

Xagaa

Deyr