PART 3: TRAINER'S GUIDE

The trainer's guide is the third of four parts contained in this module. It is NOT a training course. This guide provides guidance on how to design a training course by giving tips and examples of tools that the trainer can use and adapt to meet training needs. The trainer's guide should only be used by experienced trainers to help develop a training course that meets the needs of a specific audience. The trainer's guide is linked to the technical information found in Part 2 of the module.

Module 7 describes how to assess the nutritional status of populations through nutrition surveys. This module can be used to provide a practical training for field workers to plan and carry out a nutrition survey. It can also provide a short practical briefing on different ways of interpreting survey results for senior managers. This module focuses on population assessment while individual assessment (anthropometry) is covered in Module 7.

Navigating your way around the guide

The trainer's guide is divided into six sections.

1. **Tips for trainers** provide pointers on how to prepare for and organise a training course.
2. **Learning objectives** set out examples of learning objectives for this module that can be adapted for a particular participant group.
3. **Testing knowledge** contains an example of a questionnaire that can be used to test participants' knowledge of nutrition surveys either at the start or at the end of a training course.
4. **Classroom exercises** provide examples of practical exercises that can be done in a classroom context either by participants individually or in groups.
5. **Case studies** contain examples of case studies (one from Africa and one from another continent) that can be used to get participants to think by using real-life scenarios.
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1. Tips for trainers

Step 1: Do the reading!

- Read Part 2 of this module.
- Familiarise yourself with the technical terms from the glossary.
- Read through the following key document (see full references and how to access them in Part 4 of this module)[1]:

  Essential readings
  - SMART (2006) Measuring mortality, nutritional status and food security in crisis situations. SMART methodology, version 1.
  - WFP&CDC. (2005). *A Manual: Measuring and Interpreting Malnutrition and Mortality* Rome: WFP.

  More readings
  - SCUK. (2004). *Emergency Nutrition Assessment: Guidelines for Field Workers*. London: SCUK.
  - FAO. (2007). *Distance Learning Course: Nutritional Status Assessment and Analysis*. Rome: FAO.
  - FAO/FSAU. (2005). *Nutrition: a guide to data collection, analysis, interpretation and use*, p. 13-32 and Appendices 1, 2 and 4. Nairobi: FSAU.

Step 2: Know your audience!

- Find out about your participants in advance of the training:
  - How many participants will there be?
  - Have any of the participants already been involved in doing nutrition surveys?
  - Could participants with experience be involved in the sessions by preparing a case study or contribute through describing their practical experience?

Step 3: Design the training!

- Decide how long the training will be and what activities can be covered within the available time. In general, the following guide can be used:
  - A **90-minute** classroom-based training session can provide a basic overview of the steps involved in a survey and the data that needs to be collected.
  - A **half-day** classroom-based training session can provide an overview of the steps involved in designing a survey and calculating a representative sample and include practical exercise 2 or 3.
  - A **one-day** classroom-based training session can provide a more in-depth understanding of survey methodology and practice with some practical exercises and a case study.
  - A **three- to four-day** classroom and field training can provide participants with the skills needed to design and implement a survey.
  - This module does not cover the use of statistical software to analyse anthropometric data.
- Identify appropriate learning objectives. This will depend on your participants, their level of understanding and experience, and the aim and length of the training.
- Decide exactly which technical points to cover based on the learning objectives that you have identified.
- Divide the training into manageable sections. One session should generally not last longer than an hour.
- Ensure the training is a good combination of activities, e.g., mix PowerPoint presentations in plenary with more active participation through classroom-based exercises; mix individual work with group work.

[1] Survey and anthropometric measurements methodology and analysis are evolving. The readings indicated might not be totally up to date but give basic principles.

Step 4: Get prepared!

- Prepare PowerPoint presentations with notes (if they are going to be used) in advance and do a trial run. Time yourself! Recommended PowerPoint presentations that can be adapted from existing sources include (see full references and how to access them in Part 4 of this module):

Existing PowerPoint presentations for a session on measuring malnutrition: population assessment

	Author	Specific session
1.	SMART Contact: www.smartmethodology.org; check the SMART website for latest updates on manuals and associated standardised training materials	
2.	FAO (2007). FAO Food Security Information for Action Distance Learning Material – Food Security Information Systems and Networks; Reporting Food Security Information; Nutritional Status Assessment and Analysis. http://www.foodsec.org/dl/dlintro_en.asp (Free of charge registration provides access to the material)	Nutritional Status Assessment and Analysis (2.5-3 hours) • Nutritional Status and Food Security • Assessing Status • Nutritional Status Indicators
3.	University of Nairobi, FSAU & FAO. (2005). Training Package of Materials for the Course Food and Nutrition Surveillance and Emergency.	Unit II (Sessions 7 to 14) covers assessment and analysis of nutritional problems in emergencies with a view to guiding an appropriate humanitarian response. The power point teaching aids are presented in the Appendix.

- Prepare exercises and case studies. These can be based on the examples given in this trainer's guide but should be adapted to be suitable for the particular training context.
- Find the appropriate equipment for the session including a few copies of the United Nations System Standing Committee on Nutrition (SCN) Nutrition in Crisis Situations (NICS) publication, which lists nutrition survey results around the world on a quarterly basis.
- Prepare a 'kit' of materials for each participant. These should be given out at the start of the training and should include:
  - Timetable showing break times (coffee and lunch) and individual sessions
  - Parts 1, 2 and 4 of this module
  - Pens and paper

REMEMBER

People remember 20 per cent of what they are told, 40 per cent of what they are told and read, and 80 per cent of what they find out for themselves.

People learn differently. They learn from what they read, what they hear, what they see, what they discuss with others and what they explain to others. A good training is therefore one that offers a variety of learning methods which suit the variety of individuals in any group. Such variety will also help reinforce messages and ideas so that they are more likely to be learned.

2. Learning objectives

Below are examples of learning objectives for a session on measuring malnutrition in populations. Trainers may wish to develop alternative learning objectives that are appropriate to their particular participant group. The number of learning objectives should be limited; up to five per day of training is appropriate. Each exercise should be related to at least one of the learning objectives.

Examples of learning objectives

At the end of the training participants will:

- Be able to design appropriate objectives and methods for nutrition surveys.
- Understand how to calculate sample sizes for nutrition surveys.
- Understand how to do cluster sampling.
- Be aware of the practical steps involved in implementing nutrition surveys.
- Be able to interpret anthropometric and non-anthropometric nutrition survey results.
- Understand the meaning of prevalence and confidence intervals.
- Be able to summarize the essential content of a nutrition survey report.

3. Testing knowledge

This section contains one exercise which is an example of a questionnaire that can be used to test participants' knowledge about nutrition surveys either at the start or at the end of a training session. The questionnaire can be adapted by the trainer to include questions relevant to the specific participant group.

Exercise 1: What do you know about nutrition surveys?

What is the learning objective?

- To test participants' knowledge about nutrition surveys

When should this exercise be done?

- *Either* at the start of a training session to establish knowledge level.
- *Or* at the end of a training session to check how much participants' have learned

How long should the exercise take?

- 15 minutes

What materials are needed?

- **Handout 1a:** What do you know about nutrition surveys? Questionnaire
- **Handout 1b:** What do you know about nutrition surveys? Questionnaire answers

What does the trainer need to prepare?

- Familiarize yourself with the questionnaire questions and answers.
- Add your own questions and answers based on your knowledge of the participants and their knowledge base.

Instructions

Step 1: Give each participant a copy of handout 1a

Step 2: Give participants 10 minutes to complete the questionnaire working alone

Step 3: Give each participant a copy of handout 1b

Step 4: Give participants 5 minutes to mark their own questionnaires and clarify the answers where necessary.

Handout 1a: What do you know about nutrition surveys?: Questionnaire

Time for completion: 10 minutes

Answer all the questions

For some questions there is only ONE correct answer while for other questions there are SEVERAL correct answers.

1. True or false?

   Cross-sectional random-sampled anthropometric surveys can only provide an estimate of the level of malnutrition in a population.

2. Which of these populations would be difficult to survey? *Circle the correct answers.*

   a) Pastoralists living in small remote communities.

   b) Children aged 6 to 59 months in Internally Displaced Person (IDP) camps

   c) Populations living in insecure areas with many landmines

3. True or false?

   Sample size depends mainly on the sampling method used and not the size of the target population.

4. Which are the commonly used sampling method for anthropometric surveys? *Circle the correct answer.*

   a) Simple random sampling

   b) Interval/systematic sampling

   c) Cluster sampling

5. Nutrition status (wasting) should be expressed as: Circle the correct answer.

   a) Estimated prevalence of height-for-age in Z scores and percentage of the median with 95 per cent confidence intervals

   b) Estimated prevalence of weight-for-height in Z scores with 95 per cent confidence intervals

6. Name three common tools which can be used to assess non-anthropometric data

   1.

   2.

   3.

7. Which of these should be included in the summary of a nutrition survey report? *Circle the correct answers.*

   a) Methodology

   b) Description of the emergency and emergency-affected population

   c) Results

   d) Tables of coping strategies

   e) Recommendations

8. True or false?

   Repeat anthropometric surveys should be carried out in the same season

Handout 1b: What do you know about nutrition surveys? Questionnaire answers:

1. **True** or false?
   Cross-sectional nutrition surveys can only provide an estimate of the level of malnutrition in a population.

2. Which of these populations would be difficult to survey?
   a) Pastoralists living in small remote communities
   b) Children aged 6 to 59 months in IDP camps
   c) Populations living in insecure areas with many landmines
   Access and security are primary concerns in doing nutrition surveys.

3. **True** or false?
   Sample size depends mainly on the sampling method used and not the size of the target population.

4. Which are the commonly used sampling methods for nutrition surveys?
   a) Simple random sampling
   b) Interval/systematic sampling
   c) Cluster sampling
   The three methods can be used. Simple and interval/systematic will be used when a list of target population is available or living accommodation is well organised. Cluster sampling will be used when the target population is dispersed and the above statements do not apply.

5. Nutrition status (wasting) should be expressed as:
   a) Estimated prevalence of height-for-age in Z scores and percentage of the median with 95 per cent confidence intervals
   b) Estimated prevalence of weight-for-height in Z scores with 95 per cent confidence intervals

6. Name three common tools used to assess non-anthropometric data.
   Sample answers: Questionnaires, focus group interview, key information questionnaires, direct observation, secondary information, seasonal calendars, maps.

7. Which of these should be included in the summary of a nutrition survey report?
   a) Methodology
   b) Description of the emergency and emergency-affected population
   c) Results
   d) Tables of coping strategies
   e) Recommendations

8. **True** or false?
   Repeat anthropometric surveys should be carried out in the same season
   While it is good practice to carry our repeat surveys during the same season so as to compare over time and attribute seasonality appropriately, it is not always possible to do this. Sometimes repeat surveys are needed every three months at the peak of an emergency to asses if interventions are contributing to lowering malnutrition prevalence. Afterwards it may be possible to do surveys every 6 or even 12 months depending on the context. Financial limitations often mean repeat surveys are not always timed optimally.

4. Classroom exercises

This section provides examples of practical exercises that can be carried out in a classroom context either by participants individually or in groups. Practical exercises are useful between plenary sessions, where the trainer has done most of the talking, as they provide an opportunity for participants to engage actively in the session. The choice of classroom exercises will depend upon the learning objectives and the time available. Trainers should adapt the exercises presented in this section to make them appropriate to the particular participant group. Ideally, trainers should use case examples with which they are familiar.

Exercise 2: Designing appropriate objectives and information to be collected

What is the learning objective?

- To be able to design appropriate objectives and data collection for nutrition surveys

When should this exercise be done?

- Half-way through the session

How long should the exercise take?

- 45 minutes

What materials are needed?

- **Handout 2a:** Designing a nutrition survey: Gaza Strip 2003
- **Handout 2b:** Designing a nutrition survey: Gaza Strip 2003: Model answers

Instructions

Step 1: Divide participants into pairs.

Step 2: Give each participant a copy of Handout 2a.

Step 2: Give participants 30 minutes to read the case study and address the questions.

Step 3: Allow 15 minutes of discussion in plenary.

Handout 2a: Designing a nutrition survey: Gaza Strip 2003

Source: Nutritional assessment – anthropometric survey Gaza Strip. March 2003. Ard El Insan and Accion contra el Hambre.

Time for completion: 30 minutes

Read the following case example

The Palestinian population of the Gaza Strip has been exposed to varying levels of hardship and violence for decades. In 2003 the humanitarian situation was deteriorating. A second intifada (uprising by the Palestinians) was declared in 2000 while Israel had imposed severe restrictions on movement by Palestinians between the Gaza Strip and Israel. This meant that over 120,000 people who had worked in Israel before September 2000 lost their jobs. The United Nations estimated that the unemployment rate had reached around 50 per cent, compared to 10 per cent before the intifada. These figures were of great concern given that many households were dependent on the income of one person only. Poverty had increased from 21 to 66 per cent between 2000 and 2002 and the World Bank warned that the Palestinian economy was disintegrating and close to collapse.

The 1,197,591 inhabitants of the Gaza Strip were confined to a land area of 360 square kilometres of which 30 per cent was under Israeli occupation. Movement from the villages to the fields was becoming increasingly difficult for the few who had access to land at a time when purchasing power was reduced. As a result, the World Food Programme estimated that two thirds of households were having difficulty in obtaining food. There are five zones in the Gaza Strip, all of which had been negatively affected by the situation.

Information from various sources indicated that while wasting in children was relatively low (less than 2 per cent), stunting was on the increase.

Since September 2000, assistance activities have expanded in scope and scale. According to United Nations figures, over half of Palestinians (55 per cent of the total population) were dependent on external assistance in 2003. A large-scale food assistance programme was launched, targeting vulnerable groups and providing 2500 kcals per day (a full ration).

Although Israeli authorities officially agreed to facilitate the delivery of humanitarian assistance, in practice there have been serious obstacles.

You have been asked to design a nutrition survey to be conducted in the Gaza Strip. Briefly outline your design by addressing the following questions:

1. What are your objectives?
2. Which population groups will be included in the sample?
3. What type of information will you collect?

Handout 2b: Designing a nutrition survey: Gaza Strip 2003: Model answers

Source: Nutritional assessment – anthropometric survey Gaza Strip. March 2003. Ard El Insan and Accion contra el Hambre.

The goal of the survey was to evaluate the anthropometric nutritional status of Palestinian children in Gaza Strip, aged 6 to 59 months.

There are a number of food assistance programmes but the percentage of the population receiving food assistance and from which source is not clear. The anthropometric survey was taken as an opportunity to ask a few well-defined questions about food assistance.

Other information was of interest to understand the overall nutrition and humanitarian situation such as the major diseases affecting the children, the source of drinking water, the food security pattern and the infant and young child feeding practices. Most of this information was available from secondary sources. For example, there was a good morbidity surveillance system in place through the health structures from which data on major diseases could be extracted. Several food security assessments had been undertaken by various agencies from which a global pattern on food security could be drawn. Information on infant and young child feeding practices (IYCF) was lacking. However, it was decided not to include questions on these in the current survey as the target population for IYCF is mothers of children 0-24 months, so the households and sample size needed would be different than those for anthropometry. Moreover, the questionnaire will be of a significant length and it was thought that adding these questions to the current survey could undermine the quality of the survey.

1. What are your objectives?
   - To determine the prevalence of different types of malnutrition (wasting, stunting and underweight) among Palestinian children 6-59 months of age in the Gaza Strip
   - To determine the percentage of families that have received any food donation in the last six months
2. Which population groups will be included in the sample?

   Total population estimated: 1,197,591

   Target group: Anthropometry: Children from 6 to 59 months
   Food assistance: Households
3. What type of information will you collect?

   Anthropometric information collected: Age, Sex, weight, height, oedema, MUAC

   Non-anthropometric information collected:
   - **Food donation**: to know if the family received any food donation in the last six months
   - **Type of food donation**: to specify source, if the family receives any food donation

Exercise 3: Allocation of clusters

What is the learning objective?

- To understand how cluster sampling is done

When should this exercise be done?

- Half-way through the session

How long should the exercise take?

- 20 to 30 minutes

What materials are needed?

- **Handout 3a:** Cluster allocation form
- **Handout 3b:** Cluster allocation form: Model answers
- Random number tables
- Calculators

Instructions

Step 1: Give each participant a copy of Handout 3a and the random number tables.

Step 2: Give participants 20 minutes to allocate the clusters and then allow 10 minutes for plenary feedback and discussion.

Handout 3a: Cluster allocation form

Time for completion: 20 minutes

Allocate the 30 CLUSTERS to the villages using the information below.

Interval between clusters:

Random number to begin cluster allocation:

WILAYA	VILLAGE/ DAIRA	TOT POP*	UNDER-5 POP	CUMULATIVE POP	CLUSTER ALLOCATION	CLUSTER NUMBER
DAKHLA	Oum drega	6170	1111	1111		
	El_argoub	5853	1054	2165		
	Ain-rl-Beida	5710	1028	3192		
	Bir-N'Zazare	5423	976	4168		
	Boudjour	5224	940	5109		
	Gleibatt-el Foula	4946	890	5999		
	J'reifia	4679	842	6841		
EL-AAIUN	Hagounia	6589	1186	8027		
	Daoura	6597	1187	9215		
	Bou-Craa	6283	1131	10346		
	D'Cheira	6209	1118	11463		
	Amgala	5346	962	12426		
	Guetta	5481	987	13412		
AOUSSERD	Tichla	6212	1118	14530		
	Lagouera	6285	1131	15662		
	Bir-Gendouz	5201	936	16598		
	Mijek	5120	922	17519		
	Aghouenit	5094	917	18436		
	Zoug	4562	821	19258		
SMARA	Farsia	7554	1360	20617		
	Haouza	7369	1326	21944		
	J'Deria	7268	1308	23252		
	Tifariti	6480	1166	24418		
	Bir Lahlou	5249	945	25363		
	Mahbes	5590	1006	26369		
	27 feb school	2160	389	26758		
TOTAL		**148654**	**26758**	**26758**		

* ESTIMATED POPULATION BASED ON UNHCR DATA

Handout 3b: Cluster allocation form: Model answers

Interval between clusters: 26758/30 891 (always round down the sampling interval to the lower digit)
Random Number to begin between 1 and 891: e.g., 89

WILAYA	VILLAGE/ DAIRA	TOT POP*	UNDER-5 POP	CUMULATIVE POP	CLUSTER ALLOCATION	CLUSTER NUMBER
DAKHLA	Oum drega	6170	1111	1111	89, 980	1&2
	El_argoub	5853	1054	2165	1871	3
	Ain-rl-Beida	5710	1028	3192	2762	4
	Bir-N'Zazare	5423	976	4168	3653	5
	Boudjour	5224	940	5109	4544	6
	Gleibatt-el Foula	4946	890	5999	5435	7
	J'reifia	4679	842	6841	6326	8
EL-AAIUN	Hagounia	6589	1186	8027	7217	9
	Daoura	6597	1187	9215	8108, 8999	10&11
	Bou-Craa	6283	1131	10346	9890	12
	D'Cheira	6209	1118	11463	10781	13
	Amgala	5346	962	12426	11672	14
	Guetta	5481	987	13412	12563	15
AOUSSERD	Tichla	6212	1118	14530	13454, 14345	16&17
	Lagouera	6285	1131	15662	15236	18
	Bir-Gendouz	5201	936	16598	16127	19
	Mijek	5120	922	17519	17018	20
	Aghouenit	5094	917	18436	17909	21
	Zoug	4562	821	19258	18800	22
SMARA	Farsia	7554	1360	20617	19691, 20582	23&24
	Haouza	7369	1326	21944	21473	25
	J'Deria	7268	1308	23252	22364, 23255	26&27
	Tifariti	6480	1166	24418	24146	28
	Bir Lahlou	5249	945	25363	25037	29
	Mahbes	5590	1006	26369	25928	30
	27 feb school	2160	389	26758	–	–
TOTAL		**148654**	**26758**	**26758**		

* ESTIMATED POPULATION BASED ON UNHCR DATA

In order to ensure that no mistakes were made: if the number corresponding to the 30th randomly selected cluster is added to the sampling interval (891), the resulting number should be outside the range of the target population, i.e. above 26 758.

Exercise 4: Assessing quality and completeness of nutrition survey reports

What is the learning objective?

- To be able to judge the quality and completeness of a nutrition survey report

When should this exercise be done?

- Half-way through the session

How long should the exercise take?

- 90 minutes

What materials are needed?

- **Handout 4a:** Nutrition survey report
- **Handout 4b:** Nutrition survey report completeness check list

Instructions

Step 1: Divide participants into pairs.

Step 2: Give each participant a copy of Handout 4a.

Step 2: Give participants 45 minutes to read the case study and address the questions.

Step 3: Ask one pair to present their conclusions about information missing/inadequate; ask the other pairs if they found additional information missing.

Handout 4a: Nutrition survey report

Time for completion: 45 minutes

Read the following survey report.

Working in pairs, fill the completeness checklist and make a list of missing/inadequate information. Do not complete the mortality-related data checklist because mortality was not assessed in the survey.

NUTRITION ASSESSMENT REPORT[2]

GEDO PASTORAL, AGRO-PASTORAL AND RIVERINE LIVELIHOOD SYSTEMS GEDO REGION, SOMALIA

MAY 2008
FSAU, UNICEF and Partners

EXECUTIVE SUMMARY

The nutrition situation in Gedo region has remained precarious over the years with the most recent livelihood-based assessments conducted in Gedo in April 2007 reporting critical nutrition levels that were above the emergency threshold of 15%. The poor nutrition situation in the region has largely been attributed to the chronic food insecurity arising from man-made disasters (conflicts) and natural causes such as drought which affected the livelihood and social support systems in the region. The chronically high levels of morbidity particularly diarrhoea and poor child feeding and care practices have also been identified as major contributory factors to malnutrition. These factors have not been addressed sufficiently creating the need for continued nutrition surveillance in order to give reliable information that can be used in designing appropriate responses.

Food Security Analysis Unit (FSAU) and partners[3] conducted three nutrition assessments in Gedo Region in May 2008:- Gedo Pastoral, Gedo Agro pastoral and Gedo Riverine livelihood systems (*See map 1*). A two stage Probability proportionate to size (PPS) methodology was used in sampling. Using the Emergency Nutrition Assessment (ENA) for Standardised Monitoring and Assessment of Relief and Transitions (SMART) software, a total of 715 households were calculated as the minimum number of households required in each of the livelihood systems for both anthropometric and mortality assessments from which 26 clusters per livelihood were sampled. Overall, samples of 1000; 742 and 782 children aged 6-59 months were assessed from Pastoral, Agro pastoral and Riverine Livelihoods respectively for anthropometric assessment. The main objective of the survey was to determine the level of wasting among children aged 6-59 months in the specific livelihood systems in the region.

Results indicate critical to very critical nutrition levels with Global Acute Malnutrition (GAM) rates of >15%. The pastoral and riverine livelihoods reported a **Very Critical** nutrition situation with GAM rates of **23.3%** (18.9-27.7) and **21.5%** (17.6-25.4) respectively, while the agro-pastoral livelihood reported a **Critical** level with a GAM rate of **18.8%** (15.2-22.3). A total of six oedema cases were identified in the region that included three (0.4%) in Agro-pastoral, two (0.2%) in pastoral and one (0.1%) in the Riverine livelihoods. When compared with the most recent nutrition assessments conducted in April 2007 where the Pastoral livelihood reported a GAM rate of **19.9%** (17.4-22.7), Agro-pastoral livelihood recorded a GAM of **16.7%** (14.4-19.3) and the Riverine livelihood a GAM rate of **17.7%** (CI: 15.3-20.4), the results indicate a deterioration from critical to very critical levels of acute malnutrition among the Pastoral and Riverine populations and a sustained critical nutrition situation among the Agro-pastoral population, according to FSAU Nutrition Categorization Framework. However, as the confidence interval ranges overlap between the current and April 2007 results there is **no statistically significant difference between these findings**. Similarly there is no statistical difference between the acute malnutrition rates reported in the three livelihood zones as the GAM rate ranges overlap.

[2] For the sake of the exercise, the report was amended and does not correspond to the original report.

[3] UNICEF, GHC, SRCS, NCA, WFP and COSV

Possible explanation for the deterioration of the situation could be the negative impact of the poor rain performance in the region which has affected crop production as well as pasture and water availability, ultimately affecting livestock body conditions and milk production. The effect of the global rise in food prices and inflation has made the situation of the chronically food insecure population in the region even worse. This is particularly worrying given that the main source of staple food reported across all livelihoods, is purchase.

The nutrition situation in Gedo Region is overall **Very Critical** and has deteriorated since the April 2007 nutrition assessment and the integrated nutrition analysis during post Deyr '07/08 in January 2008 which reported a Critical situation. The nutrition situation seems to have worsened and reverted back to very critical levels recorded prior to April 2007. This could be attributed to the impact of the poor *Deyr 07/08* cereal production of 2% PWA and crop failure in the Gu '07 particularly in North Gedo and the overall poor Gu'08 rains reported across Gedo. This has negatively affected crop and livestock production in the region. The situation has been made worse by rising global food prices coupled with the chronically high morbidity and poor child feeding and care practices, which have remained unaddressed over years. Rehabilitation of acutely malnourished children through existing selective feeding programs coupled with active case finding of acutely malnourished children in the rural areas are needed until household food security is restored and critical public health issues are addressed. Capacity building of the existing MCH and the community to manage acute malnutrition could also be explored.

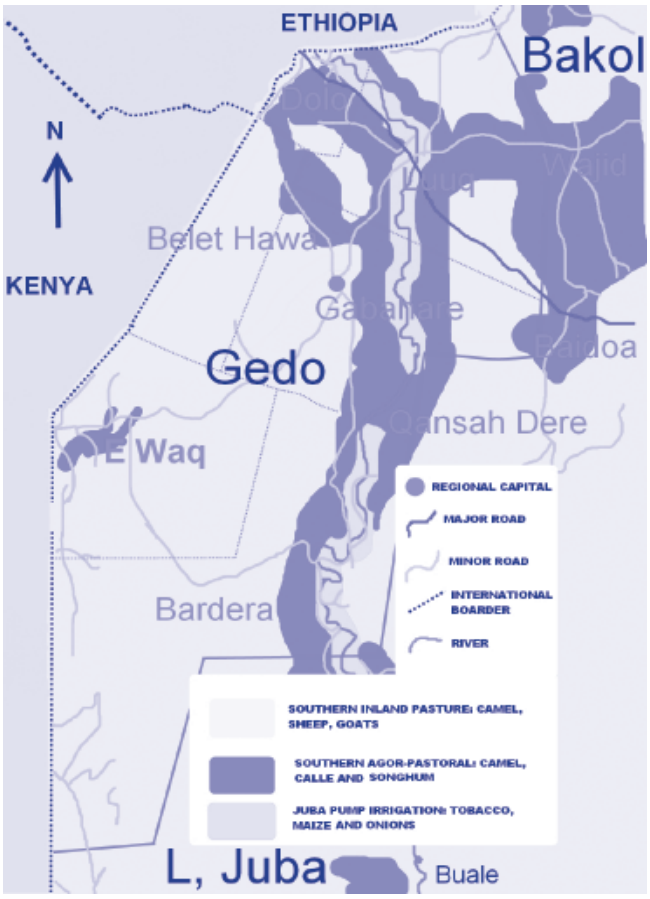
SUMMARY OF THE FINDINGS						
	Pastoral		Agro-pastoral		Riverine	
Indicator	**N**	**%**	**N**	**%**	**N**	**%**
Total number of households surveyed	403	100	418	100	485	100
Total number of children assessed	1000	100	742	100	782	100
Child sex: Males (boys) Females (girls)	519 481	51.9 48.1	421 321	56.7 43.3	433 349	55.4 44.6
Global Acute Malnutrition (<-2 Z score or oedema WHO standards)	228	**22.8** (18.2-27.4)	149	**19.0** (15.3-22.7)	172	**22.0** (17.4-26.7)
Severe Acute Malnutrition (<-3 Z score or oedema WHO standards)	51	**5.1** (3.3-6.9)	36	**4.9** (3.2-6.6)	47	**6.0** (3.8-8.2)
Global Acute Malnutrition (WHZ<-2 or oedema NCHS ref)	233	**23.3** (18.9-27.7)	139	**18.8** (15.1-22.3)	168	**21.5** (17.6-25.4)
Severe Acute Malnutrition (WHZ<-3 or oedema NCHS Ref)	30	**3.0** (1.8-4.2)	14	**1.9** (0.9-2.9)	33	**4.2** (2.2-6.3)
Oedema	2	0.2 (0.5-0.9)	3	0.4 (0.0-0.9)	1	**0.1** 0.0-0.4
Global Acute Malnutrition (WHM<80% or oedema NCHS Ref)	130	**13.0 (9.8-16.2)**	78	**10.5 (7.9-13.1)**	102	**13.0 (8.7-14.0)**
Severe Acute Malnutrition (WHM<70% or oedema NCHS Ref)	13	**1.3** (0.5-2.1)	8	1.1 (0.2-1.9)	12	**1.5** (0.4-2.7)
Children (9-59 months) immunised against measles	728 N=946	77.0 (66.4-87.5)	278	39.3 (26.5-52.0)	606	81.1 (70.9-91.4)

1.0 Introduction

Gedo Region is located in the South West of Somalia (*See Map 1*) and borders Ethiopia to the North, Kenya to the West and has an estimated population[4] of 328,378. Gedo region comprises six districts (Luuq, Dolo, Belet Hawa, Garbaharey, El Wak, and Bardera) with six main district capital urban centres. The main rural livelihoods zones in Gedo region are Bay Bakool Agro Pastoralist, Dawa Pastoralist, Juba Pump Irrigation Riverine, Southern Agro Pastoral and Southern Inland Pastoral (*See Map 1*).

Gedo is one of the regions in Somalia that have been greatly affected by a series of shocks from both natural and man-made causes. The devastating impact of these frequent shocks gives limited opportunity to the population to recover between shocks leading to a chronic emergency situation for parts of the population. According to the FSAU Integrated Food Security and Livelihood Phase Classification, parts of the region persistently faced a **Humanitarian Emergency (HE)** situation from 2004 to 2007.

However, the more recent analysis by FSAU during the Post Deyr 07/08 assessment indicated that the overall food security situation in southern Gedo, had improved to the **Generally Food Insecure (GFI)** phase (from Chronic Food Insecure watch situation in *Gu*'07) following good *Deyr* '07/08 cereal harvest, which amounted to 291% of the Post War Average (PWA), with 99% coming from Bardera District. In addition, the Southern Inland Pastoralists in southern Gedo experienced livestock recovery with high calving and kidding, leading to increased access to milk and milk products. However, the situation remained either in the **Acute Food and Livelihood Crisis (AFLC)** or **HE** in northern Gedo following poor *Deyr 07/08* cereal production of 2% PWA and crop failure in the Gu '07. Live-stock had also not fully recovered. About 35,000 and 10,000 people were classified in AFLC and HE phases respectively. This makes the overall food security in the Region precarious given that the livelihood system has been diminished or destroyed completely in parts of Gedo over years due to recurrent shocks.



Map 1

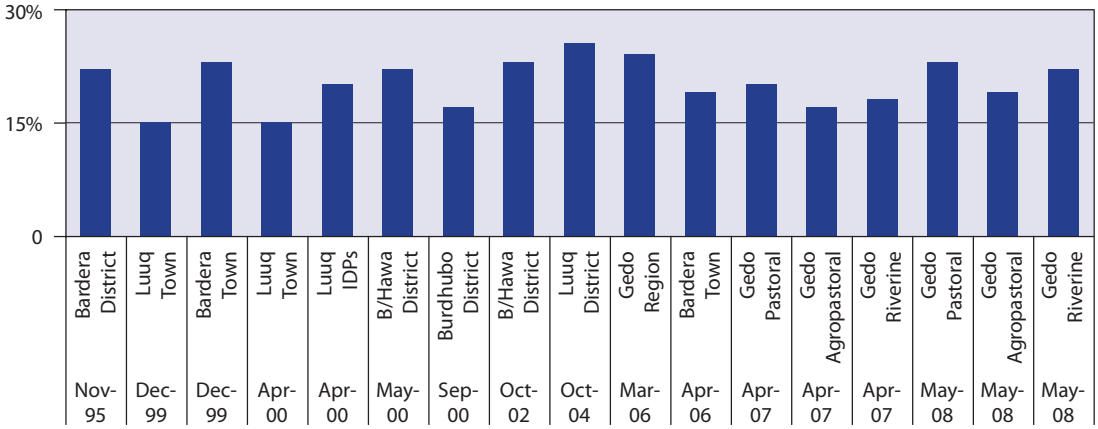
Nutrition Situation trends

A poor nutrition situation has persisted in the region with critical levels of acute malnutrition that are above emergency threshold of 15% recorded over years. From 1980 to 1988 nutrition assessments conducted in Gedo region indicated varying levels of Global Acute Malnutrition (GAM) below 15% ([5]WHM< 80% or oedema) indicating a worrying nutrition situation. The nutrition situation further deteriorated in the early nineties following the collapse of the government and subsequent conflict leading to famine conditions with extremely high levels of acute malnutrition with highest GAM rates of 38% and 37% recorded in Bardera in January 1993 and in Belet Hawa in July 1996 respectively. However, the more recent livelihood-based assessments conducted in Gedo in April 2007 reported lower yet still critical nutrition levels above the emergency threshold of 15%. This was a slight improvement (though still critical) from the previous regional assessment that reported a very critical nutrition situation with GAM rates of >20%. The poor nutrition situation in the region has largely been attributed to the chronic food insecurity arising from man made disasters (conflicts) and natural causes such as drought which affected the livelihood and social support systems in the region. The chronically high levels of morbidity particularly diarrhoea and poor child feeding and care practices have also been identified as major contributory factors to malnutrition. Chart 3 illustrates the trends of acute malnutrition in Gedo Region from 1995 to 2008. The trend clearly shows a precarious nutrition situation that requires constant monitoring to form the basis for feasible and appropriate interventions. This, therefore, necessitated the need for this assessment.

[4] Rural Population Estimates by Region/ District, UNDO Somalia, August 2005.

[5] Weight for Height Percentage of Median, <80% classified as global acute malnutrition

Chart 3: Trends in levels of Acute Malnutrition, 1995-2008, Gedo Region (WHZ<-2 or oedema)



2.0 ASSESSMENT OBJECTIVES

The overall objective of the three livelihood-based assessments was to establish the extent and severity of acute malnutrition and to monitor the trends of acute malnutrition in Gedo region.

Specific Objectives were:

1. To determine the prevalence of acute malnutrition and nutritional oedema among children aged 6-59 months in the three livelihood groups of Pastoral, Agro-pastoral and Riverine in Gedo region.
2. To determine the measles vaccination coverage among children in the three livelihood groups of Pastoral, Agro-pastoral and Riverine in Gedo region.

3.0 METHODOLOGY

Three cross-sectional assessments were conducted among the Pastoral, Agro-pastoral and Riverine livelihood populations of Gedo region covering all the six districts – Belet Hawa, Elwak, Dolo, Garbahare, Luuq and Bardera.

Sampling procedure

A multistage Proportional to Population Size sampling methodology was used to select 26 clusters in each livelihood from which 28 households were randomly selected for the assessment. A list of all settlements/villages/towns within each of the three assessed livelihoods in the region with their respective populations[6] formed a sampling frame from which 26 clusters were randomly selected using Epinfo ENA software. For the respective estimated acute malnutrition, population sizes, desired precision, design effects and the sample size for each livelihood see Appendix 1.

Quantitative data was collected through a standard household questionnaire for nutrition assessment (Appendix 2). Quantitative data collected included child and woman anthropometry and measles immunization coverage.

The second stage of sampling was carried out in the cluster to select the first and subsequent households. Each team, directed by assessment guides selected from the community, 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 assessment guide randomly selected the first household to be visited from among those numbers. 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 until the child was examined. Household -was defined as a group of people living together and sharing food from the same pot.

[6] Due to lack of UNDP population figures at settlement level, NID polio figures (March 2007) further verified by the assessment team were used for sampling.

Training and supervision

A five-day training of enumerators and supervisors was conducted covering interview techniques, sampling procedure, inclusion and exclusion criteria, sources and reduction of errors, taking of measurements (height, weight and MUAC), standardisation of questions in the questionnaire, levels of precision required in measurements, diagnosis of oedema, handling of equipment, and the general courtesy during the assessment.

Standardisation of measurements and pre-testing of the questionnaire and equipment were carried out in a section of Dolo town that had not been selected as a cluster for the actual assessment. Quality of data was also ensured through (i) monitoring of fieldwork by coordination team, (ii) crosschecking of filled questionnaires on daily basis and recording of observations and confirmation of measles, severe malnutrition and death cases by supervisors. All households sampled were visited and recorded including empty ones (iii) daily review was undertaken with the teams to address any difficulties encountered, (iv) progress evaluation was carried out according to the time schedule and progress reports shared with partners on a regular basis, (v) continuous data cleaning and plausibility checks (vi) monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights and (vii) continuous reinforcement of good practices. All measurements were loudly shouted by both the enumerators reading and recording them to reduce errors during recording.

Data analysis

Child and women data was entered, processed (including cleaning) and analysed using Epinfo and ENA software. The plausibility check was carried out using Epiinfo ENA software to determine the quality of data collected.

Variables examined

Age – Only children aged 6-59 months were selected for examination. The age of a child was determined from the mother/caregiver's recall, the under fives card, or from a local events calendar (appendix 3) when the birth date was not known or documented on a children health record.

Weight – UNICEF electronic scales were used to weigh children to the nearest 100g.

Height – Children were measured barefoot and bare head using height measuring boards graduated to the nearest 0.1cm. 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.

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

Arm Circumference: The Mid Upper Arm Circumference was measured using a MUAC tape to the nearest 0.1 cm.

Definition of nutritional status

The anthropometric measurement of weight and height were used to compute the WFH nutritional status indicators of the studied children.

WFH, was used to classify children into categories of nutritional status as follows:
< -3 Z-Scores or oedema of *WHO standards or NCHS reference* = Severe acute malnutrition
-3 Z-Scores ≤WFH< -2 Z-Scores of *WHO standards or NCHS reference* = Moderate acute malnutrition
<-2 Z-score or oedema of *WHO standards or NCHS reference* = Global/total acute malnutrition

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

4.0 ASSESSMENT RESULTS

Malnutrition by livelihoods

A total of 2524 children aged 6-59 months, including 1000 from pastoral, 742 and 782 from agro-pastoral and riverine livelihoods respectively were assessed. The results from the pastoral and riverine livelihoods using NCHS references indicate a **Very Critical** nutrition situation with GAM rates of **23.3%** (18.9-27.7) and **21.5%** (17.6-25.4) respectively while the agro-pastoral livelihood indicate a **Critical** level with GAM rate of **18.8%** (15.2-22.3). A total of six oedema cases were identified in the region that included three (0.4%) in agro-pastoral, two (0.2%) in pastoral and one (0.1%) in the riverine livelihood. Analysis of the data using the WHO Anthro references show more or less the same GAM results with the pastoral and riverine livelihoods recording GAM rates of 22.8% (18.2-27.4) and 22%(17.4-26.7) respectively, while agro-pastoral livelihood's results showed a GAM rate of 19.0%(15.3-22.7). However as indicated in the table below, the Severe Acute Malnutrition (SAM) rates by WHO Anthro across livelihoods were almost double those derived by NCHS references.

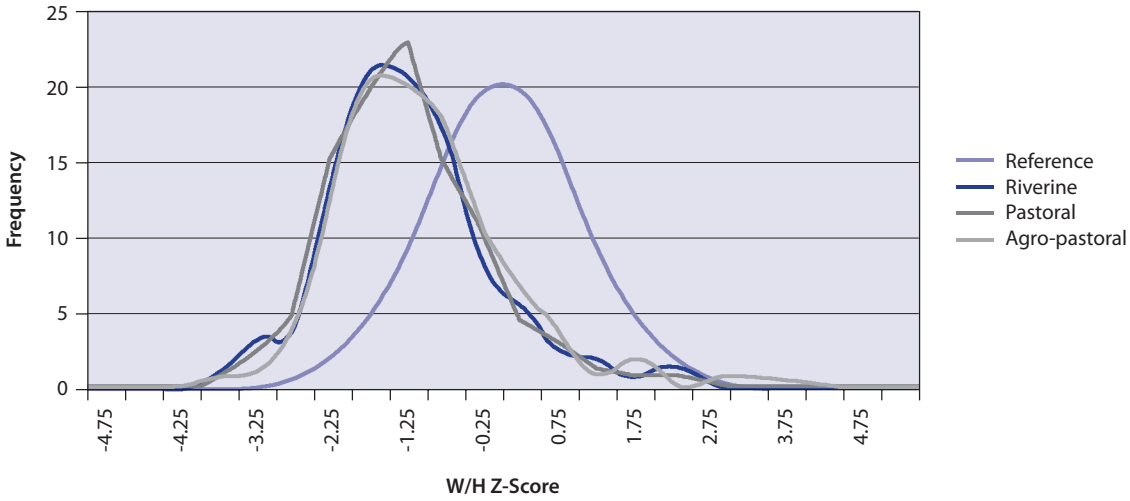
Agro-pastoral livelihood assessment recorded the highest stunting rate of 32% (26.0-38.0) followed by riverine with a rate of 26.5 %(20.0 - 42.8) while pastoral had relatively lowest rate of 19 % (15.4-22.6). Similarly, the underweight levels were highest among the agro-pastoral population at 38.2%, then riverine livelihood at 36.3% and pastoral with rate of 32.2%. A summary of the findings for malnutrition rates is given in the table below.

Summary of Malnutrition rates by livelihood systems

Malnutrition rates	Pastoral		Agro-pastoral		Riverine	
	No	% (CI)	No	% (CI)	No	% (CI)
Global Acute Malnutrition (<-2 Z score or oedema)	233	**23.3** (18.9-27.7)	139	**18.8** (15.1-22.3)	168	**21.5** (17.6-25.4)
Severe Acute Malnutrition (<-3 Z score or oedema)	30	**3.0** (1.8-4.2)	14	**1.9** (0.9-2.9)	33	**4.2** (2.2-6.3)
Oedema	2	**0.2** (0.5-0.9)	3	**0.4** (0.0-0.9)	1	**0.1** (0.0-0.4)
Global Acute Malnutrition (<-2 Z score or oedema WHO Anthro)	228	**22.8** (18.2-27.4)	149	**19.0** (15.3-22.7)	172	**22.0** (17.4-26.7)
Severe Acute Malnutrition (<-3 Z score or oedema WHO Anthro)	51	**5.1** (3.3-6.9)	36	**4.9** (3.2-6.6)	47	**6.0** (3.8-8.2)
GAM (WHM<80% /oedema)	130	13.0 (9.8-16.2)	78	10.5 (7.9-13.1)	102	13.0 (9.7-16.4)
SAM (WHM<70% /oedema)	13	1.3 (0.5-2.1)	8	1.1 (0.2-1.9)	12	1.5 (0.4-2.7)
Stunting (HAZ < -2)	190	19.0 (15.4-22.6)	237	32.0 (26.0-38.0)	207	26.5 (20.0-33.0)
Underweight (WAZ < -2)	322	32.2 (26.4-38.0)	283	38.2 (33.2-43.2)	284	36.3 (29.9-42.8)

Overall, the distribution of the weight-for-height scores in the Gedo assessments were skewed towards the left depicting a poorer nutrition situation according to international (WHO) standards. A summary of the Nutrisurvey quality checks for the assessments is given in appendix 4.

WHZ Distribution curve



Malnutrition by sex in the three livelihoods

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

Nutrition status	Pastoral				Agro-pastoral				Riverine			
	Males		Females		Males		Females		Males		Females	
	n	%	n	%	n	%	n	%	n	%	n	%
GAM (WHZ <-2 /oedema)	128	24.7	105	21.8	87	20.7	52	16.3	103	23.8	65	18.6
SAM (WHZ <-3 /oedema)	19	3.4	11	2.3	10	2.4	4	1.3	20	4.6	13	3.7
Oedema	2	0.4	0	0	3	0.7	0	0	0	0	1	0.3

In the three livelihoods a higher proportion of boys than girls were acutely malnourished. In the pastoral livelihood 24.7% of boys as compared to 21.8% of girls were acutely malnourished. Similarly 20.7% boys and 16.3% girls; 23.8% boys and 18.6% girls were acutely malnourished in agro-pastoral and riverine livelihoods respectively. However, statistically both sexes were equally likely to be acutely malnourished (p> 0.05).

Malnutrition by Age in the three Livelihoods

Distribution of Acute Malnutrition (WHZ Scores) by Age

Age (months)	Pastoral		Agro-pastoral		Riverine	
	SAM	GAM	SAM	GAM	SAM	GAM
6-17	7 (3.0%)	41 (17.5%)	4 (2.9%)	28 (20.0%)	5 (2.8%)	28 (15.8%)
18-29	9 (3.6%)	63 (25.4%)	1 (0.6%)	32 (19.5%)	9 (4.1%)	50 (22.6%)
30-41	4 (1.7%)	51 (21.7%)	2 (1.0%)	36 (18.3%)	9 (5.5%)	41 (24.8%)
42-53	5 (2.6%)	45 (23.0%)	7 (4.4%)	28 (17.7%)	8 (5.3%)	39 (25.7%)
54-59	5 (5.7%)	33 (7.9%)	0	15 (18.1%)	2 (3.0%)	10 (15.2%)
Total	30 (3.0)	233 (23.3%)	14 (2.4%)	139 (18.8%)	33 (4.2%)	168 (21.5)

The proportion of acutely malnourished children varied across livelihoods and age category. Among the pastoral population the age categories with highest (25.4%) and the lowest (7.9%) proportion of acutely malnourished children were 18-29 and 54-59 months age categories respectively. In the agro-pastoral livelihood the age category with the youngest children aged 6-17 months recorded the highest proportion of acutely malnourished children while children in the age category of 42-53 months had the lowest acute malnutrition level (17.7%). While amongst the riverine population, children in the age category of 42-53 and those aged 54-59 recorded the highest (25.7% and the lowest (15.2%) proportion of the acutely malnourished children respectively. However, analysis of distribution of acute malnutrition between the breastfeeding age group 6-24 months and the 25-59 months category, showed no statistical difference among them (p>0.05). Equally there was no statistical difference (p>0.05) in acute malnutrition levels among the children in the age of 6-29 months and 30-59 months age bands.

Acute Malnutrition by MUAC

Child Malnutrition by MUAC

Malnutrition rates	Pastoral		Agro-pastoral		Riverine	
	No	% (CI)	No	% (CI)	No	% (CI)
Child MUAC						
GAM (MUAC< 12.5 cm or oedema)	70	7.0 (5.5-8.8)	77	10.4 (8.3-12.9)	88	11.3 (9.2-13.7)
SAM (MUAC< 11.0 cm or oedema)	6	0.6 (0.2-1.4)	8	1.1 (0.5-2.2)	4	0.5 (0.2-1.4)

Based on MUAC measurements, acute malnutrition rates (MUAC< 12.5 cm or oedema) were significantly lower when compared to GAM rates assessed using by <-2 WHZ or oedema at 7.0% (CI: 5.5-8.8); 10.4% (CI: 8.3-12.9) and 11.3% (CI: 9.2-13.7) among Pastoral, Agro-pastoral and Riverine livelihoods respectively indicating serious malnutrition situation (see table above).

Measles vaccination coverage

Measles vaccination

Malnutrition rates	Pastoral		Agro-pastoral		Riverine	
	N	%	N	%	N	%
Children (9-59 months) immunised against measles	728	77.0	278	39.3	606	81.1

Coverage was all below the recommended coverage of 95% level (Sphere, 2004) across the three livelihoods with agro-pastoral livelihood recording the lowest levels.

5.0 Discussion

Results indicate critical to very critical nutrition levels with a GAM rate of >15% recorded in all three livelihoods assessed. The pastoral and riverine livelihoods assessments show a **Very Critical** nutrition situation with GAM rates of **23.3%** (18.9-27.7) and **21.5%** (17.6-25.4) respectively while the agro-pastoral livelihood recorded a **Critical** level with GAM rate of **18.8%** (15.2-22.3). This was inclusive of a total of six oedema cases that included three (0.4%) in Agro-pastoral, two (0.2%) in pastoral and one (0.1%) in the Riverine livelihood. When compared with the most recent nutrition assessments conducted in April 2007, where the Pastoral livelihood reported a GAM rate of **19.9%** (17.4-22.7), Agro-pastoral livelihood recorded a GAM of **16.7%** (14.4-19.3) and the Riverine livelihood a GAM rate of **17.7%** (CI: 15.3-20.4), the results indicate a deterioration from critical to very critical levels of acute malnutrition among the Pastoral and Riverine populations and a sustained critical nutrition situation among the Agro-pastoral population. However, as the confidence interval ranges overlap between the current and April 2007 results there is no statistically significant difference between these findings. Similarly there is no statistical difference between the acute malnutrition rates reported in the three livelihood zones as the GAM rate ranges overlap. Stunting and underweight levels are high in the three livelihoods. The pastoral livelihood recorded stunting and underweight rates of **19.0%** (15.4-22.6) and **32.2%** (26.4-38.0) respectively. The stunting and underweight rates among the riverine were **26.5%** (20.0-33.0) and **36.3%** (29.9-42.8) respectively. Among the agro-pastoralist, the respective stunting and underweight rates were **32.0%** (26.0-38.0) and **38.2%** (33.2-43.2).

Possible explanation for the deterioration of the situation could be the negative impact of the poor rain performance in the region which affects crop production as well as pasture and water availability, ultimately affecting livestock body conditions and milk production and also the out migration of livestock to areas with better pasture and water availability such as Juba. The effect of the global rise in food prices and inflation has made the situation of the chronically food insecure population in the region even worse. This is particularly worrying given that the main source of staple food reported across the livelihoods is purchase. Qualitative information indicated that households have resorted to various coping strategies including reduction in purchase of food and non-food items, switching to cheaper cereals and skipping meals and increased sale of bush products.

Measles vaccination was far below the recommended coverage. Nevertheless the reported coverage does not confirm whether the child is fully immunized due to lack of health records.

In conclusion, the overall nutrition situation in Gedo Region is **Very Critical** and has deteriorated since the April 2007 nutrition assessment and the integrated nutrition analysis during post Deyr '07/08 in January 2008, which reported a Critical situation. The nutrition situation seems to have reverted back to very critical levels recorded prior to April 2007. The worsening nutrition situation could be attributed to the impact of the poor *Deyr 07/08* cereal production of 2% PWA and crop failure in the *Gu* '07 particularly in North Gedo and the overall poor Gu'08 rains reported across Gedo. This has negatively affected crop and livestock production in the region. The situation has been made worse by rising global food prices coupled with the chronically high morbidity and poor child feeding and care practices which have remained unaddressed over years.

Intervention efforts, therefore, need to be strengthened and broadened to address both immediate life saving needs such as rehabilitation of acutely malnourished children and measures to cushion against the impact of food prices and poor rain performance. This is in addition to developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms.

6. 0 Recommendations

The slight recovery of food security and nutrition situation recorded in April 2007 in Gedo seems to have been lost and the situation reverted to the very critical nutrition situation with higher proportions of people facing food insecurity. Intervention efforts, therefore, need to be strengthened and broadened to address both immediate life saving needs such as rehabilitation of acutely malnourished children and measures to cushion against the impact of food prices and poor rain performance. This is in addition to developing longer term strategies to enhance the provision of basic services, sustainable strategies for livelihood support and social protection mechanisms.

Appendix 1: Clusters Sampling for Gedo 2007 assessment

Measure	Pastoral	Agro-pastoral	Riverine
Anthropometric surveys			
Estimated malnutrition prevalence	19.9%	16.7%	17.7%
Children below 5 years	9094	7720	7710
Desired precision	3.5	3.5	3.5
Design effect	1.5	1.5	1.5
Children to be included	711	619	647
Households to be included	594	518	541

Appendix 2: Nutrition assessment household questionnaire, 2008

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

Anthropometry and measles vaccination for children aged 6-59 months in the household

First Name	**Age**	**Sex** 1 = Male 2 = Female	**Oedema** 1 = yes 0 = No	**Height (cm)** To the nearest tenth of a cm	**Weight (kg)** To the nearest tenth of a kg	**MUAC (cm)** To the nearest tenth of a cm	**(If ≥9 months old)** Has child been Vaccinated against measles? 1 = Yes 2 = No
1							
2							
3							
4							

Appendix 3: Traditional calendar of events

Mawlid	48 Mawlid	36 Mawlid	24 Mawlid	12 Mawlid/Jamadul-awal.	Mawlid
59 Malmadoone/ Milihore	47 Malmadoone/ Milihore	35 Malmadoone/ Milihore	23 Malmadoone/ Milihore ICU took control	11 Malmadoone/ Milihore/Jamadul-awal	
58 Jamadul- Awal/	46 Jamadul- Awal/	34 Jamadul-Awal/	22 Jamadul-Awal/	10 Jamadul-Awal/	
57 Jamadul- Akhir/	45 Jamadul- Akhir/	33 Jamadul-Akhir/	21 Jamadul-Akhir/	9 Jamadul-Akhir/	
56 Rajab/ Shacbaan	44 Rajab/ Shacbaan	32 Rajab/Shacbaan	20 Rajab/Shacbaan	8 Rajab/Shacbaan	
55 Shacbaan	43 Shacbaan Election of president Abdulahi Yusuf in Kenya.	31 Shacbaan/	19 Shacbaan/	7 Shacbaan	
54 Soon **(Ramadhan)**	42 Soon **(Ramadhan)**	30 Soon **(Ramadhan)**	18 Soon **(Ramadhan)**	6 Soon **(Ramadhan)**	
53 Soon fur	41 Soonfur	29 Soonfur	17 Soonfur ICU overthrown from Mogandishu	5 Sidatal	

Appendix 4: Assessments plausibility checks

	Gedo Pastoral	Gedo Agro-pastoral	Gedo Riverine
Digit Preference score-Weight	4.31(good)	3.83 (good)	5.4 (acceptable)
Digit Preference score-Height	8.18 (acceptable)	19.8 (poor)	19.9 (poor)
Age preference	49	59	None
SD of WHZ	1.04	1.09	1.14
Skewness of WHZ	0.86 (<1: normal)	1.16	0.96 (<1: normal)
Kurtosis of WHZ	1.86	3.19 (>2: problem)	2.02 (>2: problem)
Percent of flags	(2 cases) 0.2%	(5 cases) 0.7%	(4 cases) 0.5%
Age groups (6-29)	No bias	No bias	No bias
Age Groups(30-59)	No bias	No bias	No bias
Sex Ratio (M/F)	1.08	1.31	1.24

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Handout 4b: Nutrition survey report completeness checklist (refer to http//www.cedat.be for latest version of checklist)

Pre-survey preparation and planning

Objective of the survey
1) Nutrition
2) Mortality
3) Vaccination

Population
4) Type of population stated
5) Total population in universe stated

Location
6) Geographical scope of the survey stated
7) Area excluded from sampling frame listed

Time period
8) Survey dates are stated ((dd-)mm-yyyy)

Translation
9) Language of the questionnaire is stated
10) Language of the interview is stated

Questionnaire/tool
11) Pre-testing of questionnaire stated
12) Use of local event calendar stated

Training
13) Training organisation stated

Methods

Sampling design
16-18 only if cluster sampling, ↳ 19 for other sampling designs
14) Type of sampling design stated
15) Rationale for sampling design explained
16) State if PPS was used
17) Number of clusters [ ] x [ ]

Final stage
19 only if mortality module included, otherwise ↳ 20
18) State final stage sampling
19) State if HH without U5 were included
20) Stated whether sample size was increased to account for non-response?

Household
22 only if nutrition/vaccination module included, otherwise ↳ 23
21) State definition of HH
22) State selection of U5 in the HH
23) HH selection in a compound is explained
24) Procedure for choosing respondent stated
25) Procedure for re-visiting absent hh stated

Sample size precision
26-28 only if nutrition module included, ↳ 29 ; 29-31 only if mortality module included, otherwise ↳ 32
26) Expected GAM: [ ] Stated why?
27) Expected Deff for GAM: [ ] Stated why?
28) Desired precision for GAM: [ ] Stated why?
29) Expected CMR: [ ] Stated why?
30) Expected Deff for CMR: [ ] Stated why?
31) Desired precision for CMR: [ ] Stated why?

Nutrition survey
32-36 only if nutrition module included, otherwise ↳ 37
32) GAM includes bilateral oedema
33) Inclusion criteria in terms of age or height described?
34) Weight and height smallest rounding unit described?
35) Cut-off for measuring children lying or standing stated?
36) Questionnaire is provided in Appendix

Methods (Ctd)

Mortality survey
37-40 only if mortality module included, ↳ otherwise 41
37) Recall period stated
38) Denominator calculation indicated
39) Census method indicated
40) Questionnaire is provided in Appendix

Results

Analysis
41) Name, version of the software and statistical procedure stated

Nutritional indicators
module included, otherwise ↳ 50
Definition: 42) Prevalence of GAM based on Weight for Height Z-scores reported?
43) Type of growth ref. used (WHO or NCHS) stated?
Precision: 44) Confidence interval [;]
45) Design effect: [ ]
46) Plausibility checks mentioned
47) Definition of flags stated
48) Flags exclusion from analysis described?
49) Sample size of 6-59 months: [ ]

Mortality indicators
module included, otherwise ↳ 60
Definition: 50) CMR expressed as death per 10,000/day, 1,000/month or 1,000/year
Precision: 51) Confidence interval [;]
52) Design effect: [ ]

Demographic indicators
53) Births: [ ] 54) Deaths: [ ]
55) Persons joined: [ ] 56) Pers. left: [ ]
57) Population at the time of the survey: [ ]
58) n° of households: [ ]
59) n° of U5 (0-59 months): [ ]

Vaccination indicators
60 - 63 only if vaccination module included, otherwise ↳ 64
60) MCV coverage by card and history
61) Confidence interval [;]
62) Age range for inclusion in analysis stated?
63) n° of children in the analysis: [ ]

Discussion

Limitation and bias
65-67 only if cluster sampling, ↳ 67 only if replacement was made, otherwise ↳ 68
64) % non response: [ ]
65) % inaccessible clusters: [ ]
66) Final number of clusters: [ ]
67) Replacement method stated?
68) Potential bias described?

Comparison of results
69) Results are compared to a reference

Interpretation of results
70) Recommendations are given

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Exercise 5: Summarizing nutrition survey reports

What is the learning objective?

- To be able to summarize the essential content of a nutrition survey report

When should this exercise be done?

- Towards the end of the session on Module 7

How long should the exercise take?

- 60 to 75 minutes

What materials are needed?

- **Handout 5a:** Nutrition survey report
- **Handout 5b:** Nutrition survey summary report: Model answers
- Laptops with PowerPoint or flip chart paper

Instructions

Step 1: Divide participants into groups of two or three people.

Step 2: Give each participant Handout 5a.

Step 3: Explain that the task is to present the results of the survey at a nutrition cluster coordination meeting in a clear and succinct manner.

Step 4: Give participants 60 minutes to read and summarize the survey report.

Step 5: In plenary, each group should present their summary in the form of a role play, where the presenting group represents the agency who carried out the survey, and the rest of the participants represents members of the nutrition cluster coordination group in that country (e.g., government representatives, donors, other nutritionists).

Handout 5a: Nutrition survey report

Time for completion: 60 minutes

Read the following survey report.
Working in small groups of two or three, prepare a summary of the reports (with PowerPoint slides or flipchart paper) with key information on methods, results and recommendations. You should prepare about 10 slides or chart pages in total.

Present your findings to members of the nutrition cluster coordination group in that country (e.g., government representatives, donors, other nutritionists) as if you were part of the agency that had carried out the survey.

NUTRITION ASSESSMENT[7]
IN AGRO-PASTORAL AREAS OF SHINILE, DAMBAL AND ERRER DISTRICTS SOMALI REGION
AUGUST 2004

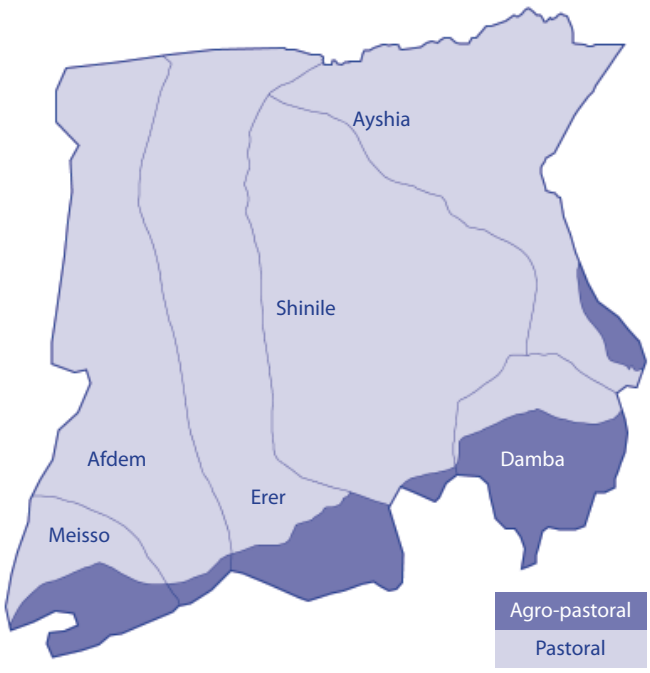
Introduction

Shinile zone is one of the nine administrative zones in the Somali National Regional State. The majority of the zonal population are pastoralists, dependent on livestock for their livelihoods. In addition, 15 to 25 per cent of the zonal population are agro-pastoralists, found in the Shinile agro-pastoral food economy zone (FEZ).[8]

This report covers the agro-pastoral areas of Shinile, Dambal and Erer districts in the zone. The population in these districts is made up of different Somali groups. The Issa, the majority of whom are pastoralists, are the dominant clan in the Shinile zone. The Gurgura, Gadabursi and Hawiya are mainly agro-pastoral and inhabit the Erer, Dambal and Mieso districts. Erer and Shinile are located along the railway line, while Dambal is far from the railway. The other major route in the zone is the loose surface gravel road between Dire Dawa and Djibouti, which passes through parts of three districts, Shinile, Dambal and Ayshia.

The main rainy seasons in this FEZ are the *gu* and *karan*. The gu normally starts in late March and ends mid-May. The *karan* rains start in July and continue up to early September. The *gu* rains are followed by the *hagaa* season, which is a dry period that can cause crop failure if the *gu* rains are not sufficient.

Access to arable land is free unless there are clan animosities. The main crops grown by the agro-pastoralists are sorghum, followed by maize. The *karan* rains determine what is harvested from the long maturing cereal varieties planted in the gu and also provide a second opportunity for cultivation of a short maturing variety of maize (*dega nugul*). The performances of the *'gu'* and *'karan'* rains determine whether the year is considered normal, good or bad.



Map of Shinile

[7] For the sake of the exercise, the report was amended and does not correspond to the original report.

[8] Main source: *Shinile Agro-pastoral Food Economy Zone HEA Baseline Study*, SCUK, DPPB and Partners, October 2001.

The major vulnerability/risk factor is the failure of seasonal rains, which adversely affect crop, pasture and water availability and lead to poor livestock production, body condition and low prices. Other risk factors include restrictions on the collection of bush products like charcoal, firewood and construction materials, which are important sources of income for the poor groups. Clan and other conflicts are another source of risk because they can block access to markets, farmland and grazing as well as water sources.

There is cross-border trade with Somaliland and Djibouti, which provides income for livestock traders and labourers involved in rental of pack-camels to transport goods from either Djibouti or Somaliland. The railway passes through almost all Shinile districts, which also provides trade benefits for Shinile agro-pastoralists.

Coping strategies employed by households in this FEZ include: increased sales of livestock, sending children to stay with wealthier relatives, increased employment seeking, reduced number of meals, substitution of less expensive foods and migration in search of pasture and water. The better off groups would also reduce gifts. In bad years, these strategies become less effective as more people are involved and returns fall.

Generally, the infrastructure of Shinile zone is very poor, with only one main road connecting Dire Dawa and Djibouti that passes through Aysha town. There are only rough roads connecting all the peasants' associations (PAs) within the zone, and there is often no road access to many parts of the zone during the rainy seasons. There is no public transport between the PAs of Shinile zone, except between Dire Dawa and Shinile town. Pack animals are the major means of transportation in rural areas. The main Addis Ababa-Djibouti railway also passes through Shinile zone.[9]

Health facilities are limited and of poor quality. There is 1 health centre, 27 health stations or clinics, and 4 health posts within the 3 districts included in the survey. However, these health facilities are often insufficient, with poor staffing levels and a shortage of drugs and medical supplies. Regarding health staff the numbers are as follows: 1 doctor, 14 junior nurses, 2 midwives, 2 lab technicians, 3 sanitarians and 7 senior nurses.[10]

The number of school facilities in the surveyed districts are as follows: 21 primary schools, 4 intermediate, 2 secondary and the total number of teachers is 158. The main market within the zone is in Dire Dawa town.

There is also a significant traffic of unofficial cross-border trade from Djibouti. The trade mainly consists of non-food household items, and the final destination for this traffic is the Shinile zone, primarily Afdem district.[11]

Survey objectives

The survey objectives were to:

1. Estimate the prevalence of acute malnutrition in agro-pastoral Peasant Associations (PAs) of Dambal, Shinile and Erer districts of the Shinile zone.
2. Estimate the measles vaccination coverage in agro-pastoral PAs of Dambal, Shinile and Erer districts of the Shinile zone.
3. Determine main livelihoods of the area, condition of livestock and the proportion of households receiving relief food.

Methodology

Sampling procedure and sample size

The sample size was calculated using EPI-INFO and was based on an estimated prevalence of 20 per cent global acute malnutrition in children aged less than 5 years, a precision of +/- 5 per cent, 95 per cent confidence limits and a design effect of two. This number was rounded up to 900 with 30 children measured in each of 30 clusters.

The smallest administrative unit was considered to be the peasant association (PA). The district administration office and the bureau of agriculture provided the population figures in August 2004. The cumulative population was calculated and the sampling interval determined. Thirty-three clusters including three contingency clusters were randomly selected by assigning probability proportional to population size.

[9] *SCUK Nutrition survey report in pastoral areas of Shinile, Erer and Dambal districts*, April 2004.

[10] *SCUK Nutrition survey report in pastoral areas of Shinile, Erer and Dambal districts*, April 2004.

[11] *SCUK Nutrition survey report in pastoral areas of Shinile, Erer and Dambal districts*, April 2004.

Selection of households and children

So that the teams did not have to walk the entire way across each PA before starting a cluster, a list of the names of the villages in each PA was obtained from each PA official. A village was randomly selected in each PA where a cluster was selected.

The centre of the village was located as the starting point in each cluster. A direction was selected randomly and houses in that direction to the end of the village were counted. One house was randomly selected and every subsequent nearest household was visited, always selecting to the right hand side.

All children between the ages of 6 and 59 months in each selected household (65-110cm) were included in the sample, including all those in the last selected household. If the child's age was unknown, only children between 65 cm and 100 cm were eligible for this survey. Absent children were followed up with a second visit. If still absent, they were not replaced by another child. Teams were instructed to measure children currently in hospital or feeding programmes at this location.

Data collected

Anthropometric data

Nutritional indicators: Weight-for-height and/or oedema were used as the indicators for moderate and severe acute malnutrition.

Definitions:

Global Acute Malnutrition (GAM): <-2 Z-Scores / <80% median weight-for-height (WFH) and/or oedema (NCHS reference)
Severe Acute Malnutrition (SAM): <-3 Z-Scores / <70% median weight-for-height (WFH) and/or oedema (NCHS reference)

Age: Children between 6 and 59 months were measured. Age was recorded from immunisation cards when available or was determined using a local calendar. Only children under 110 cm (proxy for 5 years) and over 65 cm (proxy for 6 months) were measured if age could not be estimated.

Weight: A 25-kg Salter spring scale was used for children. Weight was recorded to the nearest 100 g.

Height: Children between 65 cm and 85 cm were measured lying down on a wooden height board while those above 85 cm and below 110 cm measured standing up. Length/height was recorded with 0.5 cm precision.

Oedema: The presence of nutritional oedema was determined by pressing both feet for three seconds. If a shallow print remained in both feet it was recorded as positive oedema.

Retrospective morbidity of children

Mothers were asked whether or not their children had been sick in the 15 days prior to the survey. Sickness was defined as diarrhoea (loose stools more than three times per day), cough (coughing or difficulty breathing), fever, and measles or 'other'.

Vaccination status and coverage

A completed vaccination card for measles was recorded as positive for measles vaccination. If a child did not have a card, mothers were asked to confirm whether or not their children had had a measles vaccination.

Household and key informant questionnaires

Household and key informant questionnaires were developed. The questionnaires focused on data on food security and relief. Data were both qualitative and quantitative. Every fifth house was asked the household questionnaire (including those without children). These questionnaires provided the basis for the food security analysis.

Training and piloting

The regional disaster prevention and preparedness bureau (DPPB) and local staff who were employed on temporary basis were trained. Ten of the team members had been involved in several nutrition surveys.

Initial training was provided in the following areas:

- survey design
- anthropometric measurements
- recognition of malnutrition signs and symptoms
- data collection and interview techniques

A pilot test was conducted in one area not selected for the survey. Household sampling, anthropometric measurements and questionnaires were tested.

Data analysis

Initial analysis was done by hand in the field. Further analysis was conducted using EPI-INFO version 6.04d.

Results

Anthropometric results

891 children were considered for the analysis. Nine children were excluded from final analysis due to aberrant anthropometric values.

Table 1: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
	No.	%	No.	%	No.	%	Boy : Girl
6-17 months	87	52.7	78	47.3	165	18.5	1:1
18-29 months	92	55.8	73	44.2	165	18.5	1:3
30-41 months	136	56.9	103	43.1	239	26.8	1:3
42-53 months	85	43.6	110	56.4	195	21.9	0:8
54-59 months	65	51.2	62	48.8	127	14.3	1:0
Total	**465**	**52.2**	**426**	**47.8**	**891**	**100**	**1:1**

Table 2: Prevalence of acute malnutrition based on weight-for-height Z scores and/or oedema

	6-59 months No. = 891	**6-29 months** No. = 330
Prevalence of global malnutrition (< -2 Z score and/or oedema)	(72) **8.1%** 95% CI (6.2-10.0%)	(32) **9.7%** 95% CI (6.5-12.8%)
Prevalence of severe malnutrition (< -3 Z score and/or oedema)	(3) **0.3%** 95% (0.0-0.7%)	(2) **0.6%** 95% (0.0-1.4%)

The prevalence of oedema is 0 per cent.

Table 3: Prevalence of malnutrition by age based on weight-for-height Z scores and oedema

		Severe malnutrition (< -3 Z score)		Moderate malnutrition (≥ -3 and < -2 Z score)		Normal (≥ -2 Z score)		Oedema	
Age (months)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
06-17	165	0	0.0	17	10.3	148	89.7	0	0.0
18-29	165	2	1.2	13	7.9	150	90.9	0	0.0
30-41	239	1	0.4	15	6.3	223	93.3	0	0.0
42-53	195	0	0.0	10	5.1	185	94.9	0	0.0
54-59	127	0	0.0	14	11.0	113	89.0	0	0.0
Total	**891**	**3**	**0.3**	**69**	**7.7**	**819**	**91.9**	**0**	**0.0**

Table 4: Distribution of acute malnutrition and oedema based on weight-for-height Z scores

	< -2 Z score	**≥ -2 Z score**
Oedema present	Marasmic Kwashiorkor **0** (0%)	Kwashiorkor **0** (0%)
Oedema absent	Marasmic **72** (8.1%)	Normal **819** (91.9%)

Table 5: Prevalence of acute malnutrition based on the percentage of median and/or oedema

	6-59 months No. = 891	**6-29 months** No. = 330
Prevalence of global acute malnutrition (< 80% and/or oedema)	(35) **3.9%** 95% CI (2.8-5.1%)	(18) **5.4%** 95% CI (2.9-8.0%)
Prevalence of severe acute malnutrition (< 70% and/or oedema)	(1) **0.1%** 95% (0.0-0.3%)	(1) **0.3%** 95% (0.0-0.9%)

The prevalence of oedema is 0 per cent.

Table 6: Prevalence of malnutrition by age based on weight-for-height medians and oedema

		Severe malnutrition (< 70% median)		Moderate malnutrition (≥ 70% and < 80% median)		Normal (≥ 80% median)		Oedema	
Age (months)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
06-17	165	0	0.0	11	6.7	154	93.3	0	0.0
18-29	165	1	0.6	6	3.6	158	95.8	0	0.0
30-41	239	0	0.0	8	3.3	231	96.7	0	0.0
42-53	195	0	0.0	3	1.5	192	98.5	0	0.0
54-59	127	0	0.0	6	4.7	121	95.3	0	0.0
Total	**891**	**1**	**0.1**	**34**	**3.8**	**856**	**96.1**	**0**	**0.0**

Table 7: Mean percentage of the median weight-for-height

	6-59 months No. = 891
Mean percentage of weight-for-height median	**91.9%** 95% (91.3-92.5%)

Children's morbidity

Table 8: Prevalence of reported illness in children two weeks prior to interview (No. = 93)

	6-59 months
Prevalence of reported illness	**10.4%**

Table 9: Symptom breakdown in the children who reported illness two weeks prior to interview (No. = 891)

		6-59 months
Diarrhoea	16	17.2%
Cough	32	34.4%
Fever	25	26.9%
Measles	–	–
Other	20	21.5%

Vaccination results

Table 10: Vaccination coverage: Measles for 9-59 months

Measles (with card) No. = 829	**Measles** (with card or confirmation from mother) No. = 829
(10) **1.2%** 95% CI (0.0-2.7%)	(423) **51.0%** 95% (43.4-58.7%)

Food security

110 households were interviewed.

Dependency/livelihood
90% of interviewed key informant reported to depend on both animal and agriculture.
3% of interviewed key informant reported to depend on agriculture.
3% of interviewed key informant reported to depend on animal products.
3% of interviewed key informant reported to depend on salary wage.

Livestock holdings/possession
78% reported to have animals of any kind.
22% reported they do not have any animal.

Condition of livestock of those household reported having animals
47% reported that their animal condition is average.
31% reported that their animal condition is good.
21% reported that their animal condition is poor.

Relief food in the last three months
98% of households received food.
2% of households reported they did not receive food.

Discussion.

Nutritional status

A total of 891 children aged 6 to 59 months were analysed. The sex ratio and age distributions indicate that the sample was unbiased. The prevalence of global acute malnutrition (< -2 Z scores weight-for-height) was estimated at 8.1% (95% CI 6.2-10.0%) and severe acute malnutrition (< -3 Z scores weight-for-height) was estimated at 0.3% (95% CI 0.0-0.7%).

This level of malnutrition with the absence of aggravating factors is considered typical for chronically malnourished population as per the disaster prevention and preparedness commission (DPPC) emergency nutrition assessment guidelines (December 2002). The levels of malnutrition remained stable since May 2004. The stability of nutritional status within an acceptable level since May 2004 could be linked to the ongoing relief food distribution in the areas since December 2002.[12]

Other supportive indicators, such as the food security and health situation, do not show a serious situation. In view of these findings, it is important to describe and discuss the food security, health and care situation in the surveyed areas before drawing any further conclusions and making recommendations.

Comparison with previous surveys

Three rounds of emergency nutrition surveys were conducted in agro-pastoral areas of Dambal, Shinile and Erer districts of Shinile zone in December 2002, in September 2003 and in May 2004. Therefore, the current survey is the fourth of its kind in the areas. The same sampling methodology and techniques were applied during the past three surveys and the current one. The same population and area have also been covered during those assessment times. As a result the current findings can be compared with the past three surveys

The following table and graphs show the trends in the prevalence of malnutrition in the areas since December 2002.

Table 11: Prevalence of acute malnutrition based on weight-for-height Z scores and/or oedema

	December 2002	September 2003	May 2004	August 2004
	6-59 months No. = 912	**6-59 months** No. = 898	**6-59 months** No. = 899	**6-59 months** No. = 891
GAM[13]	**(164) 18.0%** 95% CI (14.3-21.7%)	**(101) 11.2%** 95% CI (8.2-14.3%)	**(69) 7.7%** 95% CI (5.9-9.5%)	**(72) 8.1%** 95% CI (6.2-10.0%)
SAM[14]	**(18) 2.0%** 95% CI (0.9-3.1%)	**(7) 0.8%** 95% CI (0.2-1.4%)	**(4) 0.4%** 95% CI (0.0-0.9%)	**(3) 0.3%** 95% CI (0.0-0.7%)
Oedema	**0.1%**	**0.0%**	**0.0%**	**0.0%**

The tables and graphs above show the results of the current survey (August 2004) in comparison with the three previous surveys (December 2002, September 2003 and May 2004) that were conducted in the agro-pastoral areas of the surveyed districts.

It can be seen that the nutritional status of the surveyed population remains within an acceptable and stable trend in particular since the survey in May 2004. It has to be noted that there was a significant reduction in the level of malnutrition since the survey in December 2002 that might indicate an overall improvement in the level of malnutrition since then.

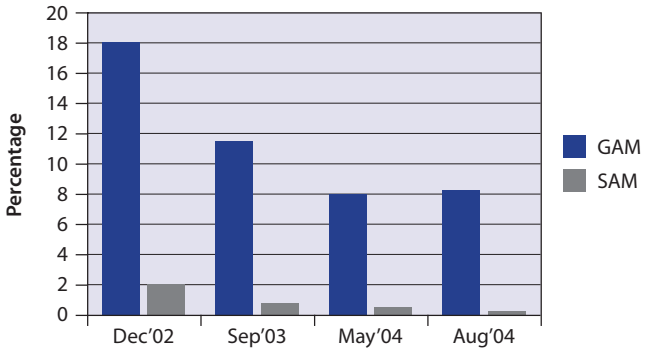
[12] Emergency Drought Relief and Recovery Programme for Shinile zone, Ethiopia. Implemented by SCUK and SCUS and funded by USAID/OFDA and food aid intervention through JEOP since December 2002.

[13] Prevalence of global acute malnutrition (< -2.00 Z score and/or oedema)

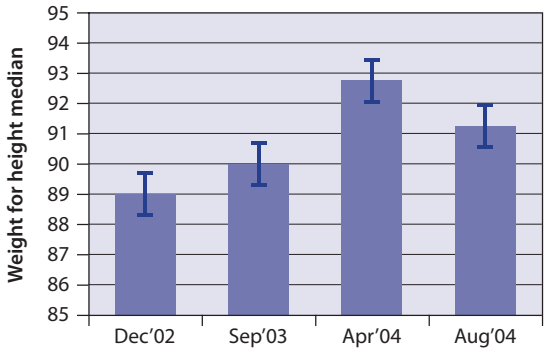
[14] Prevalence of severe acute malnutrition (< -3.00 Z score and/or oedema)

Graph 1: Trends in prevalence of global and severe acute malnutrition based on weight-for-height median and Z scores and/or oedema

Trends in prevalence of global and severe malnutrition since December 2002



The percentage Weight for Height Median and (95% confidence interval) since December 2002



The stability of the nutritional status at an acceptable level since May 2004 and the general improvement in the nutrition situation could be associated with the existing relief food distribution and the seasonal variation in the timing of the survey.

Food security situation

Livelihood

Farmers within the agro-pastoral food economy zone are usually dependent on both agriculture and livestock. Interviews conducted with key informants indicated that the majority of the surveyed population in this food economy zone are dependent on both livestock and agriculture. Few reported to have developed a number of livelihood strategies such as depending on pure livestock or agriculture and wage.

Rains and their effects

The gu or (*dirra*) and the karan rains are the main rainy season in the agro-pastoral part of the surveyed districts. The gu or (*dirra*) rains normally fall between late March and mid-May. The karan rains start in July and continue up to early September. The *karan* rains determine what is harvested from the long maturing cereal varieties planted in the gu or dirra and also provide a second opportunity for the growing of short maturing variety of maize.[15]

At the time of the survey, the discussion conducted with the key informants indicated that the performance of the last *gu* rains was not favourable and may have resulted in poor prospects of the long cycle crops that are widely grown in the agro-pastoral areas of the zone.

This condition is anticipated to affect the general condition of the livestock as the gu rains are one of the most important and determinant factors for the improvement of grazing and surface water availability.

A similar discussion conducted with these key informants indicated that the start of the current year *karan* rains was reported to be late by most of the key informants. Very few of them said that they haven't received *karan* rains at all at the time of the survey. Some of these key informants reported that the current *karan* rains started on time. The late start of the current *karan* rains is evident throughout the zone as these and similar reports through other sources (Somali Region Quarterly Food Security Update) have reported a delay of about three weeks.

It has to be noted that the poor performance of both *gu* and *karan* rains still remains a specific concern for farmers living in the vicinity as pasture and water availability is seriously affected and anticipated to become below normal particularly in the coming *jilaal* season.[16]

[15] HFE, Baseline study by SCUK and Partners, October 2001.

[16] *Jilaal* is the long dry season that usually happens between October and March.

Condition of livestock, cereal and shoat prices:

Shoat is reported to be the first, and cattle the second, dominant livestock within the surveyed areas. Most of the households own animals of some kind. At the time of the survey, the condition of livestock was reported as good/average by the majority of the interviewed households. A similar discussion conducted with key informants also reflected that the current condition of livestock was rated as good/medium.

Cereal prices have gradually increased in the past one year. This could be associated with the very poor food crop production, which was mentioned in the majority of surveyed villages. A very poor food grain supply from adjacent districts is also mentioned as one of the other reasons for the cereal price increases. Cereal prices are also dependent on the availability and continuity of relief food distributions.

Relief food

The provision of relief food has been carried out in the surveyed districts since December 2002.[17] The SCUS/SCUK Emergency Drought Relief and Recovery Programme office mentioned that the revision in the number of beneficiaries was carried out in February 2004 which resulted in a reduction of about 40 per cent of the number of previous beneficiaries. The office also indicated that, currently, about 103,300 beneficiaries from both pastoral and agro-pastoral areas of Errer, Dambal, Ayisha and Shinille districts are still receiving food aid since February 2004.

The commodities that have been provided to the beneficiaries include wheat grain, corn soy blend, oil and lentils. At the time of the survey almost all the interviewed households received relief food in the last three months. The average family size within the surveyed areas was reported to be six people. However, the amount of relief wheat distributed per household varies from 10 kg to 100 kg with an average of about 36 kg per household. This is about 6 kg of relief wheat per person per month. This amount is below the recommended amount of 15 kg /person/month.

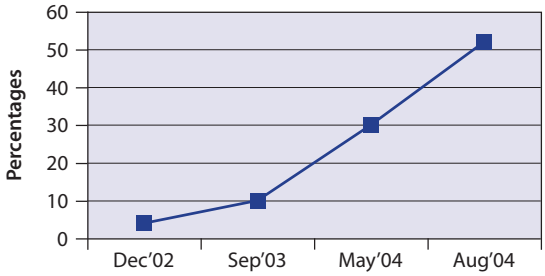
Although the quantity distributed at household level was below the recommended norms, it still has been an important contribution to the overall improvement of the nutritional status of the population, and has also played an important role in maintaining market stability.

Health

Measles vaccination coverage as confirmed by card is only 1 per cent though it increases to 51 per cent when mothers were asked to confirm whether or not their children had been vaccinated against measles or not. The current levels of measles vaccination coverage is better than all the previous years but still remains low according to the international standards.

Vaccination coverage for measles has shown an increase in coverage since the survey in December 2002. This might indicate that the general health services in the surveyed areas are getting better over time and areas located at far distances have been included for vaccination. Moreover, it may also reflect the routine Expanded Programme on Immunisation (EPI) services underway in the areas and that the measles/polio vaccination campaign has reached the remote areas as well.

Measles vaccination coverage since December 2002



[17] Emergency Drought Relief and Recovery Programme for Shinile zone, Ethiopia. Implemented by SCUK and SCUS and funded by USAID/OFDA and food aid intervention through JEOP since December 2002.

Recommendations

Short-term recommendations

Monitor the performance of the current year harvest.

Continue monitoring the nutrition situation

Although the current measles vaccination coverage has increased since the previous survey it is still low. Therefore, it is important to advocate for increased vaccination coverage.

Long-term recommendations

The surveyed areas have been food insecure due to the recurrent drought. As a result, annual production is not expected to cover food needs. Therefore, it is very important to create an opportunity for households to generate cash income through establishing income diversification projects, promoting off-farm opportunities and saving and credit associations.

Handout 5b: Nutrition survey summary report: Model answers

NUTRITION ASSESSMENT
IN AGRO-PASTORAL AREAS OF SHINILE, DAMBAL AND ERRER DISTRICTS SOMALI REGION
AUGUST 2004

SCUK undertook a nutrition survey in Shinile, Dambal, and Errer districts in August 2004. A summary of the main findings is presented in this document.

A total of 891 children aged 6 to 59 months were analysed. The prevalence of global acute malnutrition (< -2 Z scores weight-for-height) was estimated at 8.1 per cent (95 per cent CI 6.2-10.0 per cent) and severe acute malnutrition (<-3 Z scores weight-for-height and or oedema) was estimated at 0.3 per cent (95 per cent CI 0.0-0.7 per cent).

This level of malnutrition with the absence of aggravating factors is considered typical for a chronically malnourished population as per the disaster prevention and preparedness commission (DPPC) emergency nutrition assessment guidelines (December 2002). The stability of nutritional status within an acceptable level since May 2004 could be linked to the ongoing relief food distribution in the areas since December 2002.

Food security situation: The gu or (*dirra*) and the karan rains are the main rainy season in the agro-pastoral part of the surveyed districts. The gu or (*dirra*) rains normally fall between late March and mid-May. The *karan* rains start in July and continue up to early September. The *karan* rains determine what is harvested from the long maturing cereal varieties planted in the *gu* or *dirra* and also provide a second opportunity for the growing of short maturing variety of maize.[18]

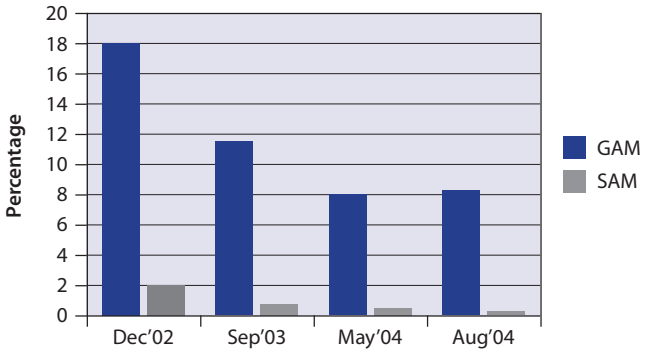
At the time of the survey, the discussion conducted with the key informants indicated that the performance of the last gu rains was not favourable and may have resulted in poor prospects of the long cycle crops that are widely grown in the agro-pastoral areas of the zone.

This condition is anticipated to affect the general condition of the livestock, as the "gu" rains are one of the most important and determinant factors for the improvement of grazing and surface water availability.

It has to be noted that the poor performance of both gu and karan rains still remains a specific concern for farmers living in the vicinity as pasture and water availability is seriously affected and anticipated to fall below normal particularly in the coming jilaal season.

Condition of livestock, cereal and shoat prices: At the time of the survey, the condition of livestock was reported as good/ average by the majority of the interviewed households. A similar discussion conducted with key informants also reflected that the current condition of livestock was rated as good/ medium.

Trends in prevalence of global and severe malnutrition since December 2002



Health:

Nearly 10 per cent of mothers reported that their children had been ill in the two weeks prior to the survey. Diarrhoea, cough, fever and other disease like malaria were reported as the most common health problems usually affecting the health of children under five.

[18] HFE Baseline Study, SCUK and Partners, October 2001.

Measles vaccination coverage as confirmed by card is only 1 per cent though it increases to 51 per cent when mothers were asked to confirm whether or not their children had been vaccinated against measles. The current levels of measles vaccination coverage is better than all the previous years but still remains low according to the international standards.

Vaccination coverage for measles has shown an increase in coverage since the survey in December 2002. This might indicate that the general health services in the surveyed areas are improving and areas located at far distances have been included for vaccination. Moreover, it may also reflect the routine EPI services underway in the areas and that the measles/polio vaccination campaign has reached the remote areas as well.

Recommendations

Short-term recommendations

- Monitor the performance of the current year harvest.
- Continue monitoring the nutrition situation
- Although the current measles vaccination coverage has increased since the previous survey it is still low. Therefore, it is important to advocate for increased vaccination coverage.

Long-term recommendations

- The surveyed areas have been food insecure due to the recurrent drought. As a result, annual production is not expected to cover food needs. Therefore, it is very important to create an opportunity for households to generate cash income through establishing income diversification projects, promoting off-farm opportunities and saving and credit associations.

5. Case studies

Two case studies, from Malawi and from Ethiopia, are presented in this section. Case studies are useful for getting participants to think through real-life scenarios. They also provide an opportunity for participants to work in a group and develop their analytical and decision-making skills. Trainers should develop their own case studies which are contextually appropriate to the particular participant group. Ideally, trainers should use scenarios they are familiar with. More detailed case study exercises have been developed for the other modules in the training course.

Exercise 6: Interpreting nutrition survey data

What are the learning objectives?

- To be able to interpret anthropometric and non-anthropometric nutrition survey results
- To understand the meaning of prevalence and confidence intervals

When should this exercise be done?

- As part of a longer in-depth training

How long should the exercise take?

- 60 to 90 minutes

What materials are needed?

- **Handout 6a:** Case study I: Political and economic turmoil in Malawi 2002
- **Handout 6b:** Case study I: Political and economic turmoil in Malawi 2002-Suggested answers
- **Handout 6c:** Case study II: Somali refugees in Hartisheik camp, Ethiopia 1988-1990
- **Handout 6d:** Case study II: Somali refugees in Hartisheik camp, Ethiopia 1988-1990-Suggested answers

What does the trainer need to prepare?

- Prepare a case study from a context familiar to the participants based on the templates in Handouts 6a and 6c and suggested answers according to Handouts 6b and 6d.

Instructions

Step 1: Distribute Handouts 6a and/or 6c on the day before this activity, so that participants can read it through in advance. If this is not possible make sure you allocate 15 additional minutes for participants to read the case study, especially if English is not their first language.

Step 2: Divide the participants into groups of (Maximum) five people.

Step 3: Ask each group to complete the task in 40 minutes. This includes preparing a five-minute presentation of their answers.

Step 4: Give each group five minutes for feedback in plenary and discuss the presentations.

Handout 6a: Case study I: Political and economic turmoil in Malawi 2002

Time for completion: 40 minutes

Spend up to 15 minutes reading through the case study you have been given.

In your group, and once you have all had time to read through the case study, nominate a rapporteur to record your main points and a spokesperson to provide feedback to the wider group. Answer the questions below.

1. What do the survey results tell us about nutritional status in Salima District?

2. What are the likely causes of malnutrition?

3. Is there any additional information you would have liked to have to help with the interpretation of the results?

Background

Malawi is a small country, 118,484 sq km, with a population of 10.18 million, in comparison with Zimbabwe which is 390,580 sq km and has a population of about 12 million. Infant and under-five mortality rates are estimated at 104 and 189 per 1,000 live births, respectively and maternal mortality is at 1,120 per 100,000 live births.[19]

The country gained independence in 1964 and its first president, Dr. Hastings Banda, of the Malawi Congress Party, became president for life. He was eventually forced, by church-led civil society, to announce a referendum about a multi-party democracy. Balkili Muluzi, of the United Democratic Front, was elected in 1994, re-elected in 1999 and recently it has been announced that the Government of Malawi will seek to change the constitution to enable him to stand for a third term in 2004.

Food security

Agriculture is the most important sector of the economy. Tobacco is Malawi's main export, and tea is its second cash crop. Fish from Lake Malawi is important as a staple food for lakeshore communities as well as an export.

Malawi is heavily dependent upon maize, which makes up 73 per cent of the total kilocalorie intake. Maize cultivation, to the exclusion of almost all other crops, was strongly encouraged during Dr. Banda's regime. Annual maize consumption levels are about 2 million metric tons (MT). The last good year of above-average production was 1999-2000, when the total yield was around 2.5 million MT. Efforts by NGOs to encourage diversification into other staples, such as sweet potato and cassava, have enabled some communities in the north to withstand the worst of the maize shortages, but this is taking time to have an impact on the country as a whole.

Population density is high and rural small holdings are generally not large enough to produce sufficient food for a household' s needs. Fertilizer is hard to come by and expensive for farmers that do not have enough land to optimize crop rotation practices. It is estimated that only 10 per cent of the country's irrigation potential is utilized, and the livestock sector is very underdeveloped. There is very little employment in the district's rural areas. The road network is poor; there are only a few sealed roads and others are regularly damaged by the heavy rains that can occur during the rainy season from January to April.

There is usually a hungry season of two to three months, before the harvest in April and May. People are used to this, and have various ways of coping, such as reducing the number of meals per day and increasing consumption of wild fruits.

Circumstances leading to the 2002 crisis

Northern Malawi experienced flooding in early 2000, but Malawi as a whole was spared by Cyclone Eline and the flooding that had devastated southern Mozambique. However, Malawi did not escape the following year. In 2001, some 335,000 people in the south and central regions, and some areas of northern Malawi, were affected by serious flooding, which destroyed crops, homes and possessions. Thousands of people spent months in camps. The flooding and late rains in February and March 2001 also meant that crop yields were down as the maize could not mature and dry out. In many places, it rotted in the fields.

At around the same time, the national grain reserves were sold off, including 15,000 MT of donor grain. This was not replaced, leaving the country without an emergency grain stock. The usual relief assistance provided by the government to see rural populations through the hungry season was therefore not available.

[19] *Malawi Demographic and Health Survey 2000*, National Statistical Office, Zomba, Malawi.

Growing shortages forced the Agricultural and Marketing Board (ADMARC) to suspend price-fixing on maize in October 2001. The price of a kilogram increased overnight by over 300per cent, from 5MK to 17MK. This caused a panic, with people selling other produce, such as sweet potato, seasonal fruits and vegetables, at very low prices in order to buy their favourite staple food. This helped to push up prices still further.

By December 2001 the food scarcity and increased maize prices were starting to have negative effects on rural communities. Fewer hectares of land were being planted, which would lead to a lower-than-normal harvest the following year. The government announced that it would import 150,000 to 200,000 MT to meet the anticipated shortfall. In February 2002, following more floods which delayed planting of some crops, there was an unseasonal dry spell that affected the maize crops at a crucial point in its growth cycle. Crops began withering and dying in the fields, having produced very small, if any, cobs. The president finally declared a state of disaster on 27 February 2002.

Current situation

As of March 2002, the government had only replaced less than half of maize stock requirements. Transport bottlenecks, financial difficulties and importation problems are cited as reasons for the slow importation of maize. There is a serious regional shortage of maize, South Africa being the only country in the region currently in a position to export it. Serious food shortages are being reported at government ADMARC outlets, and many of them are empty. Traders are taking advantage of the situation to increase their profits.

Most households cannot afford current prices and are resorting to reducing the number of meals they eat per day, harvesting premature crops, selling livestock and other assets, and eating poor quality foods, (e.g. wild foods and maize husks/bran). In addition, due to the early onset of a hungry season, normal patterns of work have broken down. Instead of preparing for a new season and working in their gardens, many Malawians have gone further afield to look for work, including migrating across borders, sleeping outside the ADMARC depots to wait to buy food, camping outside district administrators' offices in the hope that they will receive some food aid assistance, digging up and eating banana tree roots and other wild roots and tubers, scavenging for food, begging, and selling off livestock and other possessions. In many instances, it is the men who leave home to look for work or other income, leaving women and children behind in the villages. There have been reports of women leaving young children alone or in the company of other children while they go out to look for food, and even of children being sold to bring in some income. The increasing theft of green maize and other immature crops from fields, with consequent severe punishments, in communities with strong moral teachings, is an indication of the severity and volatility of the situation.

Nutritional status

SCUK took cluster sample nutrition surveys in the district of Salima regularly between 2001 and 2004. Salima borders the lake where SCUK was implementing programmes prior to the emergency in 2002, which led SCUK to set up selecting feeding programmes and food security programmes from 2002 to 2004. The results of these surveys are shown below.

Acute malnutrition in Z scores	December 2001	February 2002	February 2003	February 2004
< 5 GAM (%)	10.5 (9.2-11.8)	19.0 (17.7-20.3)	13.1 (10.8-15.4)	8.2 (6.9-9.5)
< 5 SAM (%)	4.9 (4.0-5.8)	6.0 (4.9-6.1)	2.6 (1.6-3.6)	1.4 (0.9-2.9)
CMR (per 10,000/day)	–	1.2	1.1	1.0
< 5MR (per 10,000/day)	–	2.8	2.1	1.8

Morbidity and health environment in 2002

In the flooded areas along the lake and other low-lying regions, cholera outbreaks have so far claimed over 1,000 lives (as reported in health centres). The lack of ringers-lactate in the country to contain cholera is a great concern. Malaria and anaemia are common, especially in low-lying southern areas and near the lake.

The water table remains high and it has been very difficult to replace the latrines that collapsed during the flooding. The usage of latrines is usually very low anyway (35 per cent in Salima district) and there is no well-established system of hygienic rubbish disposal. Water points are shared by people and livestock, for washing, drinking and bathing.

Many families with wage earners already have to look after additional children of relatives who have died as a result of AIDS. In rural areas the number of child-headed households is steadily increasing. The case of children being 'orphaned' repeatedly is common, as parents, aunts, uncles, grandparents die. This year it is widely acknowledged that the HIV infection is taking its toll and adding to hunger-related deaths: many HIV-positive people rely on a simple and healthy lifestyle as a guard against illness because access to health care and medicines is difficult and costly.

Handout 6b: Case study I: Political and economic turmoil in Malawi 2002 – Suggestion of answers

Question 1. Nutritional status was bad in 2002 and had almost doubled compared to 2001. It improved the following years in 2003 and 2004.

Question 2. Likely determinants:

Food insecurity in 2002: Floods; bad harvest; suspension of price-fixing of maize; insufficient importation of maize; food price increase; …

Effect of HIV/AIDS epidemics which render many children orphans and increasing number of households child-headed.

Question 3. More information on:

Household main sources of income and food

Household food consumption, including infant and young child feeding practices

Humanitarian aid provided in 2002

Information on food security in 2003 and 2004

…

Handout 6c: Case study II: Somali refugees in Hartisheik camp, Ethiopia 1988-1990i

Time for completion: ***40 minutes***

Spend up to 15 minutes reading through the case study you have been given.

In your group, and once you have all had time to read through the case study, nominate a rapporteur to record your main points and a spokesperson to provide feedback to the wider group. Answer the questions below.

1. ***What do the survey results tell us about the nutritional status of the refugees and the local population?***
2. ***What are the likely causes of malnutrition?***
3. ***Is there any additional information you would have liked to have to help with the interpretation of the results?***

The population

In June 1988 the population in northwest Somalia fled to Ethiopia, because of the outbreak of the civil war. The population was mainly from the town of Hargeisa, and was an urban, educated and fairly well-nourished population. They had to travel for three to four days. They were housed in six camps, one of which was Hartisheik. People settled themselves, and hence camps were disorganized. The population in Hartisheik was about 200,000. A large proportion of the refugee population was women and children, as many of the men in the area were either killed or were soldiers with the SNM, who continued fighting in Somalia.

The local environment

The area is flat scrubland, with heavy rains in March, and small rains in October and November. Previously only nomadic pastoralists inhabited the area, as the land is unsuitable for farming. The camp is in an isolated area, with no large markets nearby. The movement of food was restricted in Ethiopia, and particularly the availability of fresh fruit was limited.

The provision of aid to refugees was politicized as the Mengistu government tried to minimize the severity of the situation. In addition, the Ogaden region, where the refugees had settled, had long been a contested area between Ethiopia and Somalia, as most of the inhabitants are ethnic Somalis. The Somali Western Liberation Front, fighting for the liberation of the Ogaden from Ethiopia, was active in the region, and the Ethiopian military had bases in the area.

Movement in and out of the camps was restricted both for aid agencies and refugees. Agency staff could only operate in the camp from 8 a.m. until 2 p.m., and were based in Jijiga, almost a two hours' drive from the camp.

Nutritional status

Nutrition surveys in September 1988 based on two-stage cluster sampling were completed among the refugee population and the local resident population and showed the following results:

Acute malnutrition (weight-for-height)	Somali refugees Z scores	Somali refugees % of the median	Resident population Jijiga Z scores	Resident population Jijiga % of the median
< 5 GAM (%)	14.7 (12.5-17.2)	17.0 (15.7-18.3)	15.9 (13.6-18.5)	16.2 (13.8-18.8)
< 5 SAM (%)	2.2 (1.4-3.5)	3.0 (1.9-4.1)	1.4 (0.8-2.5)	1.6 (1.0-2.4)
Women's MUAC < 18.5cm	3.0%		0.8%	
CMR (per 10,000/day)	1.6		0.6	
< 5MR (per 10,000/day)	2.2		1.1	
Measles immunization with card	76.2%		52.2%	
Vitamin A distribution with card	32.1%		51.3%	

Mortality and morbidity

Regular mortality surveillance was not carried out at the start of the programme. The normal patterns of disease in the area include diarrhoea and respiratory infections during the rainy season in March and October through November, and a high incidence of chest and eye infections during the cold dry season in December and January. The prevalence of TB in the area is also high.

Health environment

Water supply was limited to three to five litres per person per day, which had to be trucked into the camp on a daily basis. Sanitation programmes are non-existent. There are no milling facilities in the camp.

Food assistance

Relief assistance was provided by the Administration of Refugee Affairs (ARA) of the Government of Ethiopia (GOE), the office of the UNHCR, the World Food Programme and a number of NGOs. Food had to be stored in Jijiga, as there was no space for warehouses in the camp. In the camp, food distribution was centralized, using family ration cards. Fuel or firewood for cooking was not provided.

Population figures

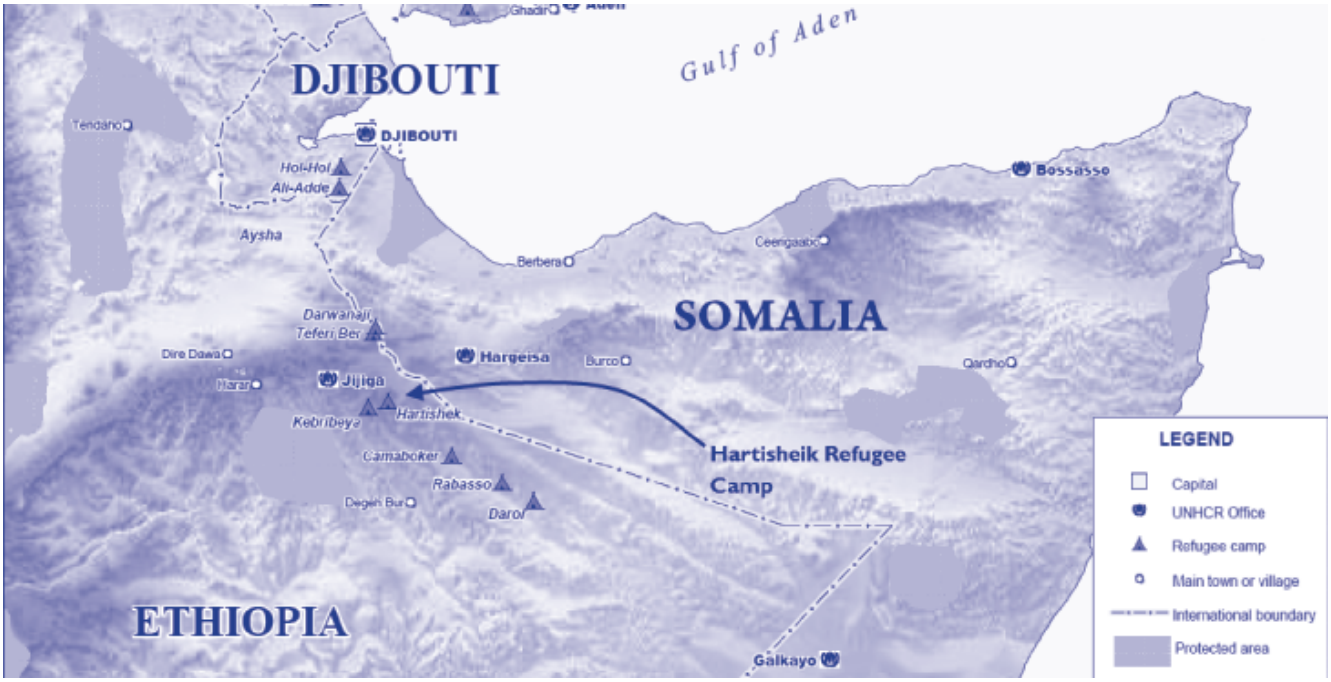
The official number of refugees registered for rations was 300,000 (e.g., number of ration cards). The true population was estimated to be around 170,000. To supply food for the camp, WFP and UNHCR used a planning figure of 200,000. Camp officials managing ration distribution waited until there was sufficient food in the camp to distribute a full ration to the number according to the ration cards. Distributions were therefore irregular. Weekly rations were given out at two- to three-week intervals.

The planned ration is shown below:

Per person per day	g	Kcal
Wheat grain	500	1725
Or wheat flour	400	
Pulses	50	172
Vegetable oil	30	270
Sugar	20	80
Corn soy blend	30	114
TOTAL		2361

In practice, the actual ration that was distributed per ration card was:

	Jan-August 1989		Feb-May 1989	
Per person per day	g	Kcal	g	Kcal
Wheat grain	412g	1421	290g	1000
Pulses	42g	143	33g	112
Vegetable oil	28g	252	25g	225
Sugar	3g	12	3g	12
Corn soy blend	28g	106	30g	114
TOTAL		1934		1463



Source: UNHCR.

Handout 6d: Case study II: Somali refugees in Hartisheik camp, Ethiopia 1988-1990 – Suggestion of answers

Question 1. Nutritional status is precarious although similar to the nutritional status of the surrounding resident population. Mortality seems higher among refugees than residents.

Question 2. Likely determinants:

Food insecurity: irregular food distribution; absence of milling and distribution of firewood so refugees must use part of their ration for this; no possibility of income-generating activities.

Poor public health, including access to water and sanitation

Question 3. More information on:

Household main sources of income and food

Household food consumption, including infant and young child feeding practices

Micronutrient status

Confidence Intervals of mortality rates

…

Exercise 7: Designing and implementing a nutrition survey

What is the learning objective?

- To be able to design appropriate objectives and methods for nutrition surveys
- To understand how to calculate sample sizes for nutrition surveys
- To understand how to do cluster sampling
- To be aware of the practical steps involved in implementing nutrition surveys

When should this exercise be done?

- As part of a longer in-depth training

How long should the exercise take?

- 1 day

What materials are needed?

- **Handout 6a:** Case study III: Afghanistan 2002
- **Handout 6b:** Case study III: Afghanistan 2002: Model answers

What does the trainer need to prepare?

- Prepare a case study from a context familiar to the participants based on the templates in Handouts 7a and b.

Instructions

Step 1: Distribute Handout 7a on the day before this activity, so that participants can read it through in advance. If this is not possible make sure you allocate additional time for participants to read the case study, especially if English is not their first language.

Step 2: Divide the participants into groups of (Maximum) five people.

Step 3: Ask each group to complete the task over the course of one day. This includes preparing a presentation of their answers.

Step 4: Give each group 30 minutes for feedback in plenary and discuss the presentations.

Handout 7a: Case study III: Afghanistan 2002

This case study is based on a real survey carried out in Badghis province, Afghanistan in March and April 2002. It has been simplified somewhat in the interests of time. Please read each background section carefully and then discuss each question. Try not to look ahead, as the background for the next question may narrow your discussion of the prior question (or worse, just give you the answer).

Part I: Survey planning

Twenty years of civil conflict has destroyed most of the infrastructure, and there has not been a well-functioning government in Afghanistan since before the conflict began. Moreover, the northern and western areas of the country have suffered a drought for the past three years. Some NGOs have reported widespread malnutrition in some villages in provinces in these areas. The vulnerability assessment mapping done by the World Food Programme during the summer of 2001 estimated that many districts in the north and west produced less than 75 per cent of their food needs (see Figure 1).

All the organizations working in health and nutrition in Afghanistan need data on the nutritional status of young children in order to plan emergency nutrition interventions. Also, the donors are demanding confirmation of the level of malnutrition before committing to provide millions of dollars to import and distribute thousands of tons of food to the population. They also want a baseline against which to evaluate the efficacy of any interventions implemented as a result of your investigation.

1. How would you gather the data needed by these organisations? Discuss the relative advantages and disadvantages of the following data collection methods.

   a) Surveillance

   b) Qualitative methods

   c) Survey

   d) Other methods?

Badghis province has been selected to be the first province in a series of province-wide nutrition and health assessment surveys. Badghis was selected because: 1) it is considered at high risk, 2) it is, on average, at a lower altitude so the snow melts earlier in the spring granting access to mountainous areas, and 3) it is close to the regional capital of Herat. Moreover, World Vision is implementing blanket supplementary feeding in two of the five districts in Badghis province for children less than five years of age and pregnant and lactating women. As a part of registration for this programme, World Vision staff screened more than 23,000 children one to four years of age with mid-upper arm circumference (MUAC) and found a worrying situation.

UNICEF has invited you to conduct a population-based survey in Badghis province to confirm or refute these results and to guide future nutrition programming. The rest of this exercise concerns planning and carrying out a province-wide survey.

2. During talks with various organizations in Islamabad, Pakistan and Herat, Afghanistan, what are the first questions you need answered in these cities in order to begin survey planning?

   After meetings with UNICEF staff and the medical and nutrition coordinators of various NGOs, you determine that the objectives of this survey will be:

   1) The prevalence of acute malnutrition (as indicated by weight-for-height) and chronic malnutrition (as indicated by height-for-age) in children less than five years of age
   2) The prevalence of malnutrition in women of reproductive age (15 to 49 years of age), as measured by body mass index (weight divided by height squared)
   3) Crude mortality rate and causes of death
   4) Age-specific mortality rates, including the mortality rate among children less than five years of age
   5) The coverage of recent measles vaccination campaigns among children nine months to five years of age
   6) The prevalence of having a safe water source for household members

3. If you were planning to do a survey to only meet Objective 1, what variables would you need to collect? Remember other variables you will need during analysis.

4. Write the questions to be posed to an adult household member to meet Objective 6.

Part II: Sample size calculation

You have formulated objectives as listed above and have begun circulating a draft data collection form for comment to all organizations working in Badghis. Now you are ready to begin planning for the sampling phase. The first thing you need to do is to determine what you will sample. Because you will include both young children and women as survey subjects, you will probably need to sample households. It would be too time consuming to select one sample of young children and a separate sample of women.

Now you need to decide how many households you will need to select. Sample size calculation is the next step because the sample size will determine many of the logistics needs of the survey, such as how many teams will be needed for data collection, how many data collection forms you will need to have printed, etc. The current population of Badghis province is estimated to be about 680,000, but this estimate does not fully account for the substantial emigration last winter because of drought.

1. What assumptions do you need to formulate before calculating sample size?

You decide that, for this survey, nutritional status will be the main outcomes which will determine the final sample size. Several NGOs say that there is a lot of acute malnutrition among children less than five years of age in provinces in the north and west of Afghanistan. There have been no reports concerning adult nutritional status, but a few NGO workers say that mothers are starving themselves in order to feed their young children. In addition to these qualitative impressions, there have been two nutrition surveys in Afghanistan in the past year that generated estimates of the prevalence of acute malnutrition. Data from other neighbouring countries in south Asia demonstrate that the prevalence of chronic malnutrition is 60 to 65 per cent.

Survey	Place	Date	Prevalence
A UNICEF Multiple Indicator Cluster Survey (MICS)	6 eastern provinces	September 2001	9.9%
Save the Children – US	Kohistan district Faryab province (next door to Badghis)	April 2001	7.0%

These surveys and other data demonstrate that each household has on average 1.3 children and 1 woman 15 to 49 years of age. Since this is an emergency nutrition assessment, you decide that you do not really need very much precision. However, the results of this survey will be used as a baseline against which to judge the efficacy of various nutrition programmes.

2. Complete the table below for each nutrition outcome. Be sure you can justify each of your assumptions.

Target population	Outcome	Estimated prevalence	Desired precision	Sample size (assuming simple random sampling)
Children 0-59 months of age	Acute malnutrition			
Children 0-59 months of age	Chronic malnutrition			
Women 15-49 years of age	Malnutrition			

3. Do you need to adjust the sample size calculated above for any other factors? If so, which factors?

4. Assuming that 25 per cent of selected households will be empty or the family unavailable, how many households must be selected to obtain 246 children less than five years of age and 246 women 15 to 49 years of age?

5. Which of the three nutrition outcomes above will be more important in determining your final sample size?

Part III: Cluster sampling

Now it is time to decide how you will select a sample of the population of Badghis province.

1. What information do you need to find in order to decide what sampling method to use?

You find out from NGO staff that they have recently registered every village and/or sub-village in Badghis province in order to carry out general food distribution during the winter of 2001 and 2002. You obtain from these NGOs their lists of villages in electronic form and create a spreadsheet containing the district where the village is located, the village name, the number of households in the village and an estimate of the village population. With this wealth of data, you decide that cluster sampling will be easy. But now you have to adjust your sample size to reflect the loss of statistical precision inherent in cluster sampling.

Of course, in order to do this you need to make some assumptions about the design effect. From your discussions with people that have travelled and worked throughout Badghis province, you get the impression that nutritional status is generally the same throughout the province. Nonetheless, Jawand district is more isolated than the other districts and the snow melts there last, so roads open later in the spring. The prior surveys in Afghanistan have found that the design effect for acute and chronic malnutrition have been less than 2. No prior survey has included an assessment of the nutritional status of adults.

2. Formulate assumptions about the design effect and complete the table you started in Question 1 in Part II to determine how many households you will need to include in the survey.

Target population	Outcome	Estimated prevalence	Desired precision	Sample size (assuming simple random sampling)	Design effect	Sample size needed
Children 0-59 months	Acute malnutrition					
Children 0-59 months	Chronic malnutrition					
Women 15-49 years of age	Malnutrition					

You decide that, given the difficulty in travelling and the shortage of time, you will include 30 clusters.

3. Using the list of villages at the end of this exercise, or on the spreadsheet supplied, select a sample of 30 villages probability proportional to size to determine where your clusters will be.

- What is the total number of households in Badghis province?
- What is the sampling fraction for the first sampling stage?

You have chosen 30 villages in Badghis province to include in the survey. You may notice that some of your selected villages are very large, with more than 1,000 households. Other selected villages are much smaller with only 50 to 100 households. You visit a few villages in Badghis province and village leaders, as well as your Afghan survey team members, tell you that all households in the province belong to a mosque to which they pay a small annual subscription fee. No household belongs to more than one mosque. Depending on the size of the mosque and the popularity of the mullah, mosques may have 25 to 150 households as subscribers. The mullah of each mosque knows each family belonging to his mosque.

You decide, based on your sample size calculations and available resources, to include 600 households in the survey.

4. How many households should be in each cluster? Should each cluster be the same size, or should clusters be larger in larger villages and smaller in smaller villages?

5. How will you select households in each village? Discuss the advantages and disadvantages of each of the following techniques:

a) EPI method of spinning a bottle to determine a random direction

b) Segmentation and random selection of one segment

c) Enumeration and random selection

d) Letting the mullah or village leaders choose the households

Because some villages are so large that it would take hours to list every household (if it could be done at all), you decide to select one mosque in villages with more than 200 households. The required number of households would then be selected from a list of all the households belonging to that mosque.

6. Below is a list of mosques and the approximate number of households belonging to each which are found in one selected village. Select one mosque probability proportional to size using the random number table in Appendix 2. (Hint: use the extra columns to add the cumulative total.)

Name of mullah	Number of families	Cumulative number families	Selected mosque
Saed Rachid	63		
Abdil Hamid	84		
Hajji Jawid Ahmad	121		
Mirwais Azamy	96		
Jalad Kolalay	134		
Mohd Azfal Hydary	60		
Abduk Khalik	73		

Part IV: Logistics and implementation

You have now completed the first stage of sampling and have figured out how you will select either households or mosques in the second and third stages of sampling. Now it is time to plan for all the survey activities, probably the most tedious but most important part of carrying out a survey.

1. You must first determine what you need to complete the survey. After reviewing the objectives of the survey (see page 2), make a list of all the equipment and supplies that you will need to carry out your survey and meet these objectives.

2. What tasks are necessary to collect the data? What should the qualifications of the person who performs these tasks?

You have enough personnel to form three teams. You estimate the team will require about half an hour at each house for data collection, and that it takes only 10 minutes to walk to the next house. However, driving to the next cluster takes one day.

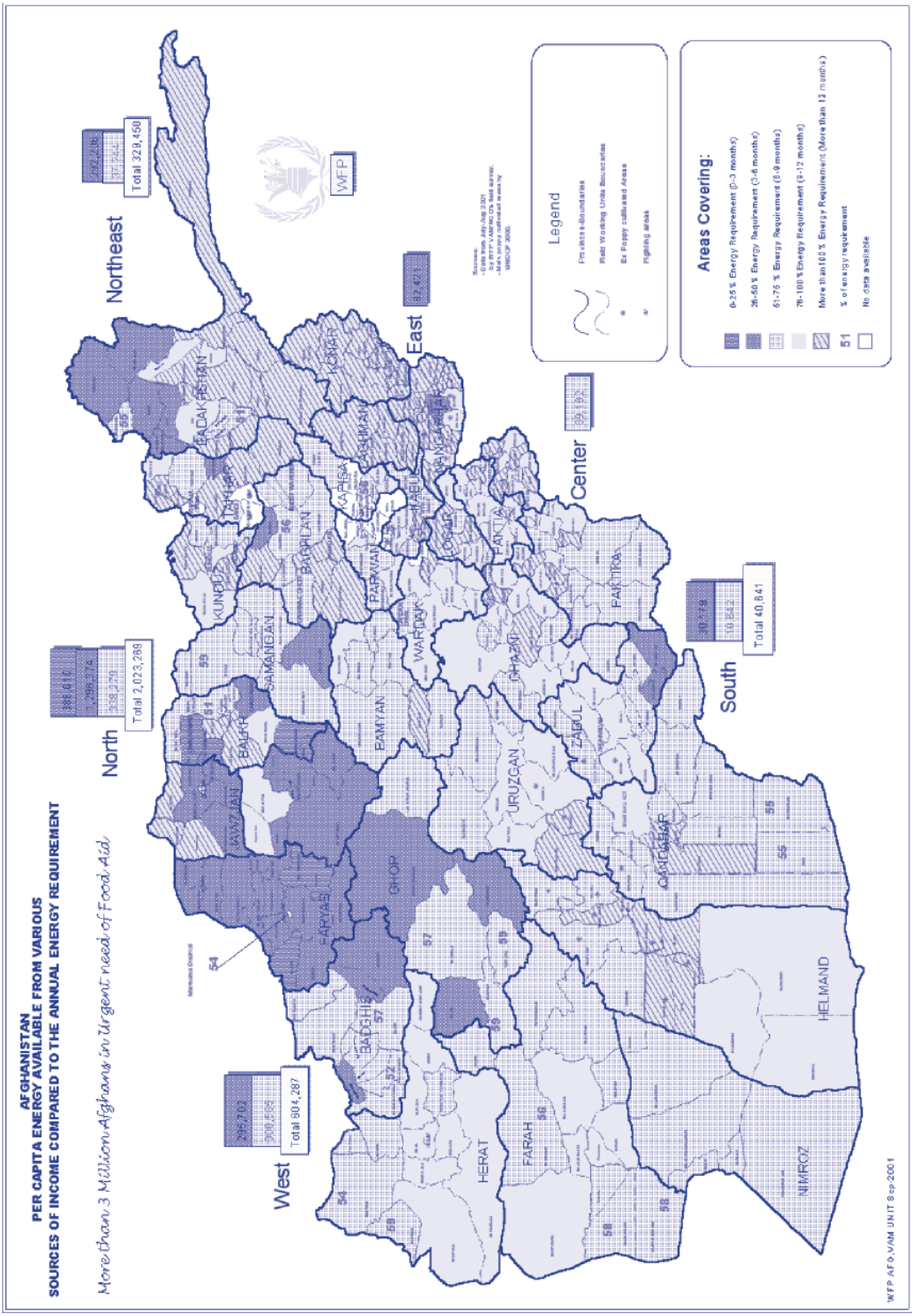
3. How much time should you budget for data collection?

Most of your planning is done. Of course, you have to arrange duplication of the data collection forms, decide on the pay scale for the various survey team members, organize and carry out the training, and take care of many other details before you can actually load up the vehicles and get started. But there is no need to include those details here.

Table 1: Random number table

76350	78339	37830	99947	43444	98453	50998	75554	04195	85201
01581	46405	52672	46305	08886	33547	38993	18768	14469	72645
67238	13884	20162	80008	62569	22205	30546	28072	44837	49459
66570	33762	21469	00199	27172	15397	82047	61497	07638	97270
10557	21230	49179	29167	91844	51682	71808	45604	47827	87184
09219	97504	31797	55465	99417	95123	17753	98301	97544	98741
32543	64753	03363	75921	19893	88730	18290	20197	61643	60201
05689	43380	65162	24128	11352	45001	03769	89504	99057	83269
03507	88301	79068	65814	83846	19277	66548	97374	68215	52775
28225	32562	80334	30146	61413	91111	43080	28520	49848	82813
99646	08072	73891	72968	00687	38170	31509	05309	49248	05801
26756	07050	27244	13452	53824	42973	53428	95469	10687	17704
25235	65105	57132	92464	29317	60554	06727	88036	74389	67967
25656	67440	05564	71519	49575	64287	00165	16939	41789	66082
33390	91113	08488	81634	16286	46749	73217	41865	19390	67245
43992	57138	00819	15070	20945	25400	57957	71599	16271	57901
13893	92231	60466	90318	37897	66912	90283	37008	36989	78760
66398	01315	02014	70505	34941	76983	61435	54541	97455	39820
31762	31972	63350	36644	33992	44364	85710	21443	77930	38707
30127	40804	64291	59007	77904	18539	75234	65215	67092	58640
32105	53327	84967	52173	65105	98585	56590	57180	25674	84454
57981	21947	84104	02266	33572	35803	16381	96110	52509	16049
56126	26952	92400	94553	96271	66806	89957	86934	47075	94908
13006	34316	09174	78732	96563	29286	02657	02883	18857	37822
71463	03840	20296	13460	48767	73046	59743	77656	04051	18536
85318	60674	67335	63363	48627	83227	35832	12923	73892	07336
88510	93235	41827	12682	46688	41684	97946	93028	99020	15613
00429	98471	73469	59309	02463	11443	64722	09558	33674	17649

Figure 1


AFGHANISTAN
PER CAPITA ENERGY AVAILABLE FROM VARIOUS
SOURCES OF INCOME COMPARED TO THE ANNUAL ENERGY REQUIREMENT
More than 3 Million Afghans in Urgent need of Food Aid
Northeast
Total 329,450
North
Total 2,023,289
West
Total 804,287
East
Center
South
Total 40,841
WFP
Legend
Areas Covering:
0-25 % Energy Requirement (0-3 months)
26-50 % Energy Requirement (3-6 months)
51-75 % Energy Requirement (6-9 months)
76-100 % Energy Requirement (9-12 months)
More than 100 % Energy Requirement (More than 12 months)
% of energy requirement
No data available
BADAKHSHAN
KUNDUZ
TAKHAR
BAGHLAN
SAMANGAN
BALKH
JAWZJAN
FARYAB
BADGHIS
HERAT
GHOR
BAMYAN
PAPWAN
WARDAK
URUZGAN
GHAZNI
ZABUL
KANDAHAR
HELMAND
NIMROZ
FARAH
KAPISA
PARWAN
KABUL
LOGAR
PAKTIA
PAKTIKA
KONAR
LAGHMAN
NANGARHAR
WFP AFG,VAM UNIT Sep-2001

List of villages in Badghis province, Afghanistan (abridged for case study)

Village no.	District	Sub-district	Area	Village	No. HHs in village	Culm no. HHs	Cluster no.
1	Jawand		Allah Yar	Chishma bid	85	85	
2	Jawand		Allah Yar	Kawriz	35	120	
3	Jawand		Jalaie	Chel Buz Kudian	19	139	
4	Jawand		Jalaie	Kamar Shar&Kandalzar	31	170	
5	Jawand		Jalaie	Pitaw Tawila&Panj Naw	43	213	
6	Jawand		Jalaie	Tandura	23	236	
7	Jawand		Kawrij	Gelak	85	321	
8	Jawand		Kawrij	Shah Ali	31	352	
9	Jawand		Khaja Surkhian	Darbar Mullah Tashi	46	398	
10	Jawand		Khawaja Surkhi	Chashma Safaid	46	444	
11	Jawand		Khawaja Surkhi	Jar Taka	73	517	
12	Jawand		Khawaja Surkhi	Nasiria	46	563	
13	Jawand		Khawaja Surkhi	Taruky	27	590	
14	Jawand		Koucha	Kala Khan	46	636	
15	Jawand		Koucha	Tair	23	659	
16	Jawand		Lalabay	Char Band Petow	50	709	
17	Jawand		Lalabay	Khak Sufar	27	736	
18	Jawand		Lalabay	Nyzar	23	759	
19	Jawand		Lalabay	Tapa Sharak	8	767	
20	Jawand		piroji	Chaya	15	782	
21	Jawand		Piroji	Kabudi	92	874	
22	Jawand		piroji	Qouduqa	27	901	
23	Jawand		piroji	Takh Rigi	50	951	
24	Jawand		piroji	Tootak	38	989	
25	Jawand		Punjbuz	Haji Rashid	42	1,031	
26	Jawand		Punjbuz	Shah Mashad	12	1,043	
27	Jawand		Punjbuz	Zir Pula Shival	123	1,166	
28	Jawand		Tate-Jawand	Ghar Girdak Takhlang	42	1,208	
29	Jawand		Tate-Jawand	Takht Kawa	58	1,266	
30	Jawand		Tate-Jawand	Shakafak	92	1,358	
31	Jawand		Yalanta	Gharma	138	1,496	
32	Jawand		Yalanta	Qala Jawhar	23	1,519	
33	Tagab Alam		Markaz	Haft Naw	4	1,523	
34	Tagab Alam		Markaz	Mrkaz TAG.	25	1,548	
35	Tagab Alam		Dawudy	Ghalak Kashta Bala	62	1,610	
36	Tagab Alam		Dawudy	Amrichestan K.Daud	24	1,634	

List of villages in Badghis province, Afghanistan (abridged for case study) (continued)

Village no.	District	Sub-district	Area	Village	No. HHs in village	Culm no. HHs	Cluster no.
37	Tagab Alam		Dawudy	Khakshorak Mulla Ramat	46	1,680	
38	Tagab Alam		Zi Hakim	Chakab	60	1,740	
39	Tagab Alam		Timury Hardoza	Pir Mohammad	21	1,761	
40	Tagab Alam		Timanya	Sislar	39	1,800	
41	Ghormach		Tutak	Habibulla	60	1,860	
42	Ghormach		Taiz Nawa	Amir	87	1,947	
43	Ghormach		Shadi Kam (1)	Abdul Qayom	60	2,007	
44	Ghormach		Bazzar	Noor Mohammad	60	2,067	
45	Ghormach		Kariz Dawana	Gull Mohammad	60	2,128	
46	Ghormach		Laie	Lal Mohammad T	67	2,195	
47	Ghormach		Laie	Mohammad Omer	39	2,234	
48	Ghormach		Pai Makhton	Gull Aqa	46	2,280	
49	Ghormach		Ab Garmak	Khan Gul	36	2,316	
50	Ghormach		Arzanak	Mulla Abdulla	43	2,359	
51	Ghormach		Shar Shar	Amir Tawakal	55	2,414	
52	Ghormach		Shar Shar	Mulla Badar	67	2,482	
53	Ghormach		Garband	Gul Ju	55	2,537	
54	Ghormach		Takht Khatun	Ahamd	60	2,598	
55	Ghormach		Kotani	Mohamad Eisa	277	2,875	
56	Ghormach		Tor Jar	Abdul Khaliq	60	2,935	
57	Ghormach		Qalai Wali	Langari	60	2,995	
58	Ghormach		Qalai Wali	Gul Mohammad	60	3,055	
59	Ghormach		Qalai Wali	Esaqzai	19	3,075	
60	Ghormach		Qalai Wali	Aqa Mohd	19	3,094	
61	Ghormach		Qalai Wali	Abdul Rahman	67	3,161	
62	Ghormach		Qalai Wali	Sakhi Dad	63	3,224	
63	Ghormach		Qalai Wali	Haji Hasan	60	3,284	
64	Qala-e-Nau		Chakaab	Cheshma Khalil	90	3,374	
65	Qala-e-Nau		Chakaab	Darzak Sofla	35	3,409	
66	Qala-e-Nau		Chakaab	Zaimat	21	3,430	
67	Qala-e-Nau		Daihistan	Sar Kamar	16	3,446	
68	Qala-e-Nau		Gundaab	Gundaab Dakhel Dara	140	3,586	
69	Qala-e-Nau		Padaha	Pada Nokdari	215	3,801	
70	Qala-e-Nau		Kokchail	Qudoq Ulia	52	3,853	
71	Qala-e-Nau		Kokchail	Khowja Gulbaid	45	3,898	
72	Qala-e-Nau		Aab Kamari	Akher Aab Kamari	688	4,586	

List of villages in Badghis province, Afghanistan (abridged for case study) (continued)

Village no.	District	Sub-district	Area	Village	No. HHs in village	Culm no. HHs	Cluster no.
73	Qala-e-Nau		Ferestanha	Ferestan Sharqi	645	5,231	
74	Qala-e-Nau		Senjetak	Darwaish Mohammadi	30	5,261	
75	Qala-e-Nau		Baghak	Shoor Howlang	71	5,332	
76	Qala-e-Nau		Qarghaito	Kowjaha Sar Cheshma	397	5,729	
77	Qala-e-Nau		Shamal Darya	Masjed Haji Habibullah	165	5,894	
78	Qala-e-Nau		Tagaab Ismail	Tagaab Ismail	180	6,074	
79	Qala-e-Nau		Kundulan	Khalifaha Pain	50	6,124	
80	Qala-e-Nau		Kundulan	Malmangi Sar Pushta Kundulan Bala	101	6,225	
81	Qala-e-Nau		Kundulan	Sad Yaka Kundulan	232	6,457	
82	Qala-e-Nau		Kharestan	Idris Kharestan	58	6,515	
83	Qala-e-Nau		Kocha Zard	Zi Shaher	35	6,550	
84	Qala-e-Nau		Kocha Zard	Abdul Hakim	39	6,589	
85	Qala-e-Nau		Gulkhana	Zai Quchi	18	6,607	
86	Qala-e-Nau		Quam Mashwani	Kargas Ghal	100	6,707	
87	Qala-e-Nau	Laman Valley	Laman Valley	Khalifa Ha	67	6,774	
88	Qala-e-Nau	Laman Valley	Laman Valley	Masumi	50	6,824	
89	Qala-e-Nau	Laman Valley	Laman Valley	Mir Mirrak	38	6,862	
90	Qala-e-Nau	Laman Valley	Laman Valley	Bagbanan Tagaab Ismail Laman	67	6,929	
91	Qala-e-Nau	Moqoor	Ghareb Woloswali	Taraki Ulia	90	7,019	
92	Qala-e-Nau	Moqoor	Sherq Woloswali	Lemary	62	7,081	
93	Qala-e-Nau	Moqoor	Sherq Woloswali	Rama Zayee	23	7,104	
94	Qala-e-Nau	Sang Atesh		Adam Khan	106	7,210	
95	Qala-e-Nau	Sang Atesh		Jahre Qaini	138	7,348	
96	Qala-e-Nau	Sang Atesh		Sar Kamar Jangal Zar	86	7,434	
97	Qala-e-Nau	Sang Atesh		Pay Lagh Ayasi	68	7,502	
98	Qala-e-Nau	Sang Atesh		Kalari Sang Aab	149	7,651	
99	Murghab		Gaze Ghoul		73	7,724	
100	Murghab		Quzichel		86	7,810	

Handout 7b: Case study III: Afghanistan 2002: Model answers

Part I: Survey planning

1. How would you gather the data needed by these organizations? Discuss the relative advantages and disadvantages of the following data collection methods.

   a) Surveillance
   Too long to set up
   May not be population-based

   b) Qualitative methods
   No given quantitative estimate useful for comparison to future surveys
   May not use standard case definitions of nutritional status

   c) Survey
   Provides a snapshot of the situation at this point in time
   Probably best method for this situation

   d) Other methods?
   Discourage use of convenience samples, obviously biased reports from community members, journalists' accounts, etc.

2. During talks with various organizations in Islamabad, Pakistan and Herat, Afghanistan, what are the first questions you need answered in these cities in order to begin survey planning?

- What data are to be collected?
  - Meet with NGOs working in health and nutrition.
  - Determine what nutrition programs currently in place.
  - Determine what decisions will be made based on survey results.
- What are the goals and objectives for survey?
  - What nutritional outcomes you want to assess
  - Who are the target groups for survey
- What are the constraints to meeting the objectives determined above?
  - Equipment availability
  - Cultural barriers to targeting subgroups

After meetings with UNICEF staff and the medical and nutrition coordinators of various NGOs, you determine that the objectives of this survey will be:

1) The prevalence of acute malnutrition (as indicated by weight-for-height) and chronic malnutrition (as indicated by height-for-age) in children less than five years of age
2) The prevalence of malnutrition in women of reproductive age (15 to 49 years of age), as measured by body mass index (weight divided by height squared)
3) Crude mortality rate and causes of death
4) Age-specific mortality rates, including the mortality rate among children less than five years of age
5) The coverage of recent measles vaccination campaigns among children nine months to five years of age
6) The prevalence of having a safe water source for household members

3. **If you were planning to do a survey to only meet Objective 1, what variables would you need to collect? Remember other variables you will need during analysis.**

- Identification of cluster
  - Date of data collection
  - District
  - Village name
  - Cluster number
  - Household number
  - Team identification number
  - Follow-up of household (completed, refused, family moved away, missing and number of revisits)
- All children 0 to 59 months of age currently in household
  - Demographic information
- Date of birth or age in months
- Sex
  - Acute malnutrition
- Weight
- Length (less than 24 months of age) or height (24 to 59 months of age)
- Presence of deformity preventing measurement of length/height
- Oedema

NOTE: Don't let the students forget to mention these items. Date of data collection is necessary to calculate the exact age of those children for who birth date is recorded. A cluster number will be necessary during data analysis to account for cluster sampling. Oedema is necessary to exclude those with oedema from an analysis of weight-for-height.

4. **Write the questions to be posed to an adult household member to meet Objective 1.**

Judge specificity and clarity of questions developed.

Part II: Sample size calculation

1. **What assumptions do you need to formulate before calculating sample size?**

- Estimate of the prevalence of the outcome to be measured
- Precision desired around this estimate
- Level of confidence – Choose 95%

2. **Complete the table below for each nutrition outcome. Be sure you can justify each of your assumptions.**

Target population	Outcome	Estimated prevalence	Desired precision	Sample size (assuming simple random sampling)
Children 0-59 months of age	Acute malnutrition			
Children 0-59 months of age	Chronic malnutrition			
Women 15-49 years of age	Malnutrition			

3. **Do you need to adjust the sample size calculated above for any other factors? Is so, which factors?**

- Households which are not available; may be estimated from prior surveys or other information about the stability of the population
- Households or individuals which refuse participation
- Average number of children and women in each household

4. **Assuming that 25 per cent of selected households will be empty or the family unavailable, how many households must be selected to obtain 246 children less than five years of age and 246 women 15 to 49 years of age?**

For children
246 children/1.3 children per household = 189 households
189 households = 75% of X households or 189 households/0.75 = 252 households

For women
246 women/1 women per household = 246 households
246 households = 75% of X households or 246 households/0.75 = 328 households

5. **Which of the three nutrition outcomes above will be more important in determining your final sample size?**

Acute malnutrition in children and malnutrition in adult women. Chronic malnutrition is generally of less concern in emergency situations because it does not indicate acute food insufficiency.

Part III: Cluster sampling

1. **What information do you need to find in order to decide what sampling method to use?**

- Is there list of all basic sampling units (e.g., households) in the province?
  - If no, must consider cluster sampling
- Is there a geographic subunit which can be sampled?
  - Do you have some indication of size, such as population or number of households?
  - If yes, can use this as first stage sampling (geographic unit will be primary sampling unit)
- In primary sampling unit, can you select sample of households?
  - If no, must find smaller geographic unit to select within primary sampling unit
  - If yes, determine how to select households

2. **Formulate assumptions about the design effect and complete the table you started in Question 1 in Part II to determine how many households you will need to include in the survey.**

Target population	Outcome	Estimated prevalence	Desired precision	Sample size (assuming simple random sampling)	Design effect	Sample size needed
Children 0-59 months	Acute malnutrition					
Children 0-59 months	Chronic malnutrition					
Women 15-49 years of age	Malnutrition					

3. **Using the list of villages at the end of this exercise, or on the spreadsheet supplied, select a sample of 30 villages probability proportional to size to determine where your clusters will be.**

- What is the total number of households in Badghis Province? 113,933
- What is the sampling fraction for the first sampling stage? 3797

You decide, based on your sample size calculations and available resources, to include 600 households in the survey.

4. **How many households should be in each cluster? Should each cluster be the same size, or should clusters be larger in larger villages and smaller in smaller villages?**

- 30 clusters of 20 households each
- Cluster size must be the same in order to end up with a sample where the probability of selection is the same for each household in Badghis.

5. **How will you select households in each village? Discuss the advantages and disadvantages of each of the following techniques:**

a) **EPI method of spinning a bottle to determine a random direction**

Advantages
Easy to carry out quickly

Disadvantages
Bias toward centre of village
Irregularly shaped villages to some households not noticed
Relies on judgment of survey workers regarding next closest house

b) **Segmentation and random selection of one segment**

Advantages
All selected households close together, so less travel

Disadvantages
Proximity of households may increase clustering and therefore design effect
May be more difficult to train survey workers in this method

c) **Enumeration and random selection**

Advantages
Allows truly random sample
Sample is dispersed throughout village, so less clustering

Disadvantages
Requires list of all households in village
May take time to compile list
May be more difficult to train survey workers in this method

d) **Letting the mullah or village leaders choose the households**

Advantages
Easy and saves time

Disadvantages
Likely to produce highly biased sample of mullah's friends and relatives, or people the mullah doesn't like
Violates a basic requirement of second-stage sampling, that is, that each eligible sampling unit has equal chance of selection

Because some villages are so large that it would take hours to list every household (if it could be done at all), you decide to select one mosque in villages with more than 200 households. The required number of households would then be selected from a list of all the households belonging to that mosque.

6. Below is a list of mosques and the approximate number of households belonging to each which are found in one selected village. Select one mosque probability proportional to size using the random number table in Appendix 2. (Hint: use the extra columns to add the cumulative total)

Name of mullah	Number of families	Cumulative number families	Selected mosque
Saed Rachid	63		
Abdil Hamid	84		
Hajji Jawid Ahmad	121		
Mirwais Azamy	96		
Jalad Kolalay	134		
Mohd Azfal Hydary	60		
Abduk Khalik	73		

Part IV: Logistics and implementation

1. You must first determine what you need to complete the survey. After reviewing the objectives of the survey (see page 2), make a list of all the equipment and supplies that you will need to carry out your survey and meet these objectives.

Training equipment
Overhead projector
Flip chart
Markers for flipchart
Scotch tape
Equipment for demonstration

Logistics and sampling
Maps of districts and province
Cluster list for each team
Random number table
Cluster control forms
Local calendar
Verbal autopsy questions

Transport
Vehicles
Drivers
Fuel
Spare parts
Spare tire and patch kit

Stationary
Clipboards
Large file folders
Copies of training manual
Pencils and erasers
Pencil shapeners
Pens
Writing pads

Anthropometry
Height boards
Scales
Portable stadiometers

Living
Bedding
Extra food
Spending money

2. What tasks are necessary to collect the data? What should the qualifications be of the person who performs these tasks?

Task	Team member
Choosing one mosque at large villages	University education, preferably public health or statistics training
Choosing sample of households at each selected village or mosque	Same
At each selected household, introducing team members and explaining survey	Respected member of community, Team supervisor
Interviewing adult respondent (often man) to gather household Information (e.g., water supply and household census)	Male interviewer, literate
Interviewing mother to determine measles vaccination status	Female interview, literate
Weighing and measuring children < 5 years of age	Nurse, community health worker, other educated person
Weighing and measuring women 15-49 years of age	Female nurse, community health worker, other educated person

You have enough personnel to form three teams. You estimate the team will require about half an hour at each house for data collection, and that it takes only 10 minutes to walk to the next house. However, driving to the next cluster takes one day.

3. How much time should you budget for data collection?

Each household	Travel between households	Working hours per day	Households per day	Time for each cluster	Total team-days
30 minutes	5 minutes	12	20	2 days	60

Therefore, with three teams, data collection will take 20 days, without any rest days.

6. Field-based exercises

This section outlines ideas for exercises that can be carried out as part of a field visit. Field visits require a lot of preparation. An organization that is actively involved in programming has to be identified to 'host' the visit. This could be a government agency, an international NGO or a United Nations agency. The agency needs to identify an area that can be easily and safely visited by participants. Permission has to be sought from all relevant authorities and care taken not to disrupt or take time away from programme activities. Despite these caveats, field-based learning is probably the best way of providing information that will be remembered by participants.

Exercise 8: Practising household selection for a cluster survey

What is the aim?

- To understand how to do cluster sampling

When should this exercise be done?

- As part of an in-depth course and after the session on measuring malnutrition

How long should the exercise take?

- 1 day, including travel time to site

What materials are needed

- **Handout 8a:** Cluster survey: Instructions
- **Handout 8b:** Cluster allocation form
- **Handout 8c:** Anthropometric survey form
- Random number tables

What does the trainer need to prepare?

- A list of villages/population units for the local area where the training is taking place with population figures
- Agreement with local representatives to visit a number of these places and allow participants to practice selecting the first house to be surveyed (Appendix 3, Part 2)
- Transport and logistical support to visit these places

Exercise 8: Practising household selection for a cluster survey (continued)

Instructions

The timing for this session will depend on the sites to be visited. It may be necessary to do the classroom part one day and the site visit the following day

Step 1: Divide the participants into groups of four. They will all work on the same task.

Step 2: (30 min.) Distribute Handout 8a and ask the groups to allocate the clusters for the population given. It is possible each group's allocation will be different because of the random number they chose. However the sampling interval should be the same.

Step 3: (half day) Choose one or two sites to visit depending on your logistical means and the number of experienced surveyors you have to hand to supervise. Explain to the participants you will simulate a survey by going to a cluster site and that they should use the cluster survey instructions to select the first two households to visit. They should interview the family and fill out the non-anthropometric parts of the questionnaire for practice. They should visit at least two houses. Once in the field site it may take the group 1 to 2 hours to do this.

Step 4: Find a suitable place to discuss the procedures and help participants correct their own mistakes if they have made any. This is a good opportunity to clear doubts on how to proceed when there is a block of flats, or a river which cannot be crossed. It is also useful to discuss how the household members responded to the visit and the questioning, so that participants become aware of how invasive surveys are.

Additional exercise

You can make this exercise more complete by using it as a chance to practice anthropometric measurement taking. For this you will need to prepare the correct equipment.

- Weighing scales and pants
- Height board
- MUAC strips
- Stationary to complete questionnaire

Handout 8a: Two-stage cluster survey: Instructions

Step 1: Selection of the 30 clusters

i) Identify the population to be surveyed (e.g., population of a refugee camp or drought-stricken area).

ii) Divide the population into existing or natural groupings (e.g., villages, districts or camp sections).

iii) Estimate the population in each village, district or camp section (use census data if available).

iv) Make a table with six columns (see box below).

- Column 1 should include the name of each locality (village, district or camp section) in any order.
- Column 2 should contain the estimated total population of each locality.
- Column 3 should contain the estimated population of the children in each locality.
- Column 4 should contain the cumulative population of the children (obtained by adding the population of each locality to the combined population figure of the preceding localities).
- Column 5 should contain the attributed numbers for each unit – the range of the cumulative population for each unit.

Geographical unit	Estimated total population	Estimated children 6-59 months	Cumulative population 6-59 months	Attributed numbers	Location of clusters
Locality 1	2,500	500	500	1-500	1
Locality 2	1,000	200	700	501-700	2
Locality 3	800	160	860	701-860	0
Locality 4	3,250	650	1,610	861-1,610	3, 4
Etc.	…	…	…	…	…
Total	**50,000**	**10,000**			**30**

v) Calculate the 'sampling interval'. This is obtained by dividing the total 6- to 59-month-old population by the desired number of clusters, which is usually between 25 and 40 (30 in this example). In this example, the sampling interval is 10,000/30 = 333).

vi) Determine the location of the first cluster. Its location is randomly chosen by selecting a number within the first sampling interval (1 to 333 in this example). The number can be randomly selected using a random number table. Let us assume that 256 is the starting point. This number places the first cluster in 'Locality 1' in the example because it has the attributed numbers 1 to 500.

vii) Select the other clusters. Add the sampling interval sequentially to the starting number until 30 numbers are chosen. Each number chosen represents the population of a geographic unit. In this example, the first cluster is at 256 (Locality 1), the second cluster at 256 + 333 = 589 (Locality 2), the third cluster is at 589 + 333 = 922 (Locality 4), the fourth cluster is at 922 + 333 = 1,255 (Locality 4), etc. A large geographical unit may appear twice – two clusters are drawn in Locality 4 in the example. In the same way, a small geographical unit (smaller than the sampling interval) may not be selected – Locality 3 in the example.

Step 2: Selection of the children in each of the 30 clusters

Having identified the 30 clusters, a team of data collectors should go to the site of each cluster. In this example, a sample size of 700 children was required. Previous data showed that on average there were 1.5 children per household. Therefore, 458 households (700/1.5 = 457.5, rounded to 458) needed to be included in the sample, or 16 households per cluster (458/30: 15.3, rounded to 16). At any given cluster, or locality the following procedure is followed:

1- Ask the village leaders if a list of all households in the locality exist. If yes, attribute a number to each household and chose 16 households with simple or systematic sampling, where you will go to conduct the survey.

2- If no list of households exists, draw a rough map of the households in the locality and carry out systematic random sampling of households.

To select 16 households by systematic sampling, you need first to determine the sampling step, which is the total number of households in the locality divided by the number of households to be sampled. For example, if there are 87 households in the locality, the sampling step will be 5 (87/16= 5.4, rounded to 5). The first household to be visited will be determined by choosing a random number between 1 and 5.

If the locality is large enough to make the techniques above too time-consuming, it can be divided into segments of roughly the same number of households, generally not more than 250 households. The procedures indicated above can then be followed.

If it is absolutely not possible to follow the above procedures, then the çspinning the pené method can be used:

– Go to the centre of the selected locality (Ask local people for information.).

– Randomly choose a direction by spinning a pencil or pen on the ground and noting the direction in which it points when it stops.

– *Walk in the direction indicated by the pen, from the centre to the outer perimeter of the locality, counting the number of households along this line*.

– The first household to be visited should be the one selected by drawing a random number between one and the number of households counted when walking. For example, if the number of households counted was 27, then select a random number from 1 to 27. If the number five was chosen, then the fifth household on the walking line is the first you should visit.

– The subsequent households are chosen by proximity. In a locality where there is a high population concentration, proceed by always choosing the next house to the right or to the left (Decide which at the beginning of the survey.). Continue to go to the left/right until the required number of children has been measured. The same method should be used for all clusters. However, if the locality has a very spread out population, then proceed by simply choosing the nearest house. The nearest house is the one with the door nearest to the last house surveyed, whether it is on the right or left (this should save you a lot of time in an area where the dwellings are very spread out). Continue the process until the required number of children has been measured.

All eligible children in a household are included and thus should be measured and weighed. This means that all eligible children in the last randomly selected household should be measured even if this means exceeding the number required to complete the cluster (that is 24 children). If a child is not present at the time of the survey go back to the house later to find the child (continue to look for the missing children until leaving the survey area). If a child cannot be found, don't replace him/her and record him/her as absent from the selected household. If a child has been admitted to a feeding centre, the team should go to the centre and measure him or her there, if feasible. If there are no eligible children in a household, collect the household-based data (if applicable) and proceed to the next household. This household is part of the 16 households that should form the cluster, even if no eligible children were found. **It is extremely important to follow this house-to-house method. If children are just called to the centre of the locality, it is likely that some of the children could be missed which could result in bias.**

If there are insufficient households found in a locality (that is 16 households) then proceed to the nearest locality. Repeat the process of spinning a pen and randomly select a household to start until the required 16 households are surveyed to complete the cluster. Proceed from house to house until you have surveyed 16 households.

Handout 8b: Cluster allocation form

Interval between clusters 76,269/30 = 2542 Random number between 1-2542 = 2025

No.	KABELLE NAME	NEW KABELLE DIVISIONS	TOTAL* Pop	Under-5 years estimates (18%)	Cumulative <5yr pop	CLUSTER ALLOCATION	
1	GAMA WALANA		10422	1876	1876		–
2	GUNUNO	Gununo1&Gununo2	14151	2547	4423	2025	1
3	LEGAMMA		11322	2038	6461	4567	2
4	ADMANCHO ARFITA		10772	1939	8400	7109	3
5	DANGARA MADALCHO		12312	2216	10616	9651	4
6	CHAMA HEMBECHO		11790	2122	12738	12193	5
7	GARA GODE		10202	1836	14575		–
8	MATALA WALANA		9227	1661	16236	14735	6
9	AREKA 1	Yukara&Areka 1	11901	2142	18378	17277	7
10	ACHURA		9260	1667	20045	19819	8
11	DOGE ANCHUCHO		13160	2369	22413	22361	9
12	WORMUMA		13372	2407	24820		–
13	AREKA 2	Areka2&Tadisa	10752	1935	26756	24903	10
14	MOROCHA WALANA		9247	1664	28420	27445	11
15	GADALA		10070	1813	30233	29987	12
16	GIDO HOMBA		11662	2099	32332		–
17	HEREJE		10182	1833	34165	35529	13
18	MATALA HEMBECHO		12501	2250	36415	35071	14
19	AMBE BADAYE	Ambe&Badaye	17810	3206	39621	37613	15
20	DUBBO		10542	1898	41518	40155	16
21	KORKE DOGE		9691	1744	43263	42697	17
22	ZABA		9922	1786	45049		–
23	AFAMA BANCHA		13802	2484	47533	45239	18
24	SHAYAMBA		8957	1612	49145	47781	19
25	ADILA		10022	1804	50949	50323	20
26	OSSE	Osse&Mole	10573	1903	52852	–	
27	DOLA		10522	1894	54746	52865	21
28	WAYBO		10584	1905	56651	55407	22
29	ANCHUCHO CHAWKARE		9022	1624	58275	57949	23
30	SUNKALE		9666	1740	60015	60491	24
31	DNAGARA SALATA		13222	2380	62395	–	
32	DEMBE ZAMINE		12852	2313	64709	63033	25
33	BOMBE	Bombe1&Bombe2	14796	2663	67372	65575	26
34	AFAMA MINO		9522	1714	69086	68117	27
35	BASA GOFARA		10604	1909	70995	70659	28
36	DACHE GOFARA		9584	1725	72720		–
37	FARA WOCHA		9598	1728	74447	73201	29
38	SORE HOMBA		10122	1822	76269	75743	30
	TOTAL		423718	76269			

* 1994 Census

Handout 8c: Anthropometric survey form

HH no.	Child no.	Name	Age in months	Sex (F/M)	Weight (kg)	Height (cm)	Oedema (Y/N)	WHZ	WHM	Measles Vaccination Card = 1; Yes, but no card = 2 No = 0