

**BASELINE NUTRITION SURVEY
NTCHISI ADP - MALAWI**

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EXECUTIVE SUMMARY

The baseline survey was conducted by the Home Economics and Human Nutrition Department of the Bunda College of Agriculture in Malawi, in Ntchisi in the Traditional Authority Nthondo area to establish the food and nutrition situation and determine contribution of fish to diets. The area was chosen because it is an area where World Vision Malawi has been operating for a number of years. One of the key interventions being implemented is fish farming.

Household Socio-Economic Characteristics

The majority of respondents (73.2%) were married in monogamous families hence most households were headed by men (77.6%). Most household heads could read and write (66.9%) compared with only 48.8% of women who could read and write. The average household size for each of the three districts was 5.2 persons which is higher than national average of 4.4 persons reported in the 2004 MDHS survey (NSO, ORC Macro 2005). Farming was the main occupation (86.0% of the household heads and 90.2% of women). Regular employment and businesses provide regular income to households, which may ensure stability of household food supplies.

Prevalence of malnutrition

Global acute malnutrition (GAM) was 1.8% and severe acute malnutrition (SAM) was 0.4% among children 6-59 months of age. Both are low and within the acceptable range of less than 3%. It is of concern however that 3.8% of infants and children aged 6 to 17 months and 3.3% aged 18 to 29 months were wasted (<-2 Zscore). This is a reflection of poor weaning practices. Prevalence of chronic malnutrition (stunting) among the children was very high 49%. Prevalence of stunting was high even among the youngest infants and the effects appear to be cumulative so that there are no improvements even among the older children 40.8% of 6 – 17 month old and the prevalence increased to 61.8% for the 54 – 59 months old children

Prevalence of underweight was 17.7% overall and 3.6% were severely underweight. The prevalence of underweight was highest among the 18 to 29 month old children (21.4%) followed by those aged 6 to 17 months (20.4%)

The results of the survey show that malaria (30.3%) was the main cause of illness followed by diarrhoea (13.3%) . Most mothers (78.9%) consulted a health facility to manage the diarrhoea but it is of concern that 10.5% did nothing during the diarrhoeal episode. Diarrhoea and malaria have the effects of reducing food and nutrient intake and at the same time increasing the body's demand for nutrients.

The crude (0.35 per 10,000) and underfive retrospective (0.31 per 10,000) mortality rates were both well below serious levels of concern of 1 death and 2 deaths per 10,000 persons respectively. The main causes of underfive mortality were fever and malnutrition each accounting for 26.1%. For crude mortality, persistent cough (40%) was the main cause of death and causes of the remaining 3 deaths were unknown. HIV/AIDS may significantly be contributing to both mortality and morbidity in this area since all the stipulated causes are interlinked with HIV/AIDS.

Child feeding, dietary diversity, and intra-household food distribution

The majority of the children (79%) had been put to the breast within the recommended period of within one hour of birth 84.5% of all children received colostrum based on mothers' memory. The results also show that only a small proportion of mothers (6%) ever bottle fed their children. It is however of grave concern that a significant proportion of mothers (44.6%) had introduced complementary foods to their youngest children before the age of six months. This is even more worrying with the possibility that those who indicated exclusive breastfeeding may have done so not out of practice but knowledge.

Most household diets comprised of staples with considerable consumption of vegetables. Using the dietary diversity score, the results showed that 44.1% of all households had low dietary diversity (≤ 3 food groups out of the 12 possible food groups or ≤ 2 out of 6 food groups bases on the Malawi food grouping of six).

At baseline, 90 households had registered to start fish farming. Most of them had completed construction of the ponds and were waiting for fingerlings. The details of their baseline dietary practices have been reported separately.

1. INTRODUCTION

Malawi is a landlocked country but has vast water resources in form of lakes and rivers. The lakes in Malawi are Lake Malawi, covering almost one third of the country's territory, Lake Malombe, Lake Chilwa, Lake Malombe and Lake Kazuni. These lakes plus the numerous rivers are a source of fish resulting in a greater part of the protein consumed in Malawi is from fish. Fish farming therefore has the potential to substantially increase fish consumption and improve incomes of rural households in Malawi.

Malnutrition is still a problem in many developing countries particularly in Africa. It is estimated that 47 million under five children are stunted in the sub-Saharan Africa whereas in the Eastern and Southern Africa 24 million under five children are stunted (UNICEF, 2008).

In Malawi prevalence of chronic malnutrition has remained high over two decades based on Malawi demographic surveys at 1990 (49% stunting), 2000 (49%), 2004(48%), and Mics of 2006 (46%). Among school aged children (5 – 10 years) stunting stand at 29.8% (M o E & VT, M o H and NSO, 2006).

Micronutrient deficiencies of vitamin A, Iron and Iodine are also of public health concern. Zinc deficiency is also likely to be highly prevalent but national studies have not yet been conducted. Based on the National Micronutrient survey of 2001, vitamin A deficiency ranged was 59% in preschool children, 57% in women of child bearing age, 38% in school children and 37% in men. The highest prevalence of anemia was found in preschool children (80%), followed by non-pregnant women (27%), school children (22%) and men (17%). Micronutrient malnutrition is therefore a serious public health problem that affects all groups in Malawi, particularly among pre-school children and women of childbearing age. Consequences of these disorders include nutritional blindness, increased susceptibility to infection, impaired growth and development, impaired cognitive function, defects in thermoregulation, increased risk of pregnancy complications, increased risk of low birth weight and increased morbidity and mortality rates.

Short term interventions for tackling micronutrient deficiencies in Malawi include biannual vitamin A supplementation, deworming and promotion of food production diversity as well. Long term measures that are being pursued include fortification of centrally processed flour, oil and salt and dietary diversification and modification.

Consumption of animal foods is relatively low based on the few localized studies that have been done and food balance sheet (FAO 2008). In Malawi it is estimated that fish contributes over 60% of the dietary animal protein (GOM, 2007). Fish are valuable to any diet directly as a food that provides variety and the essential nutrient of which fish protein is of high biological value particularly Sulphur containing amino acids hence a good complement to cassava and cereal based diets fish are also a good source of thiamin, niacin, riboflavin, iron and calcium. Small fish that are eaten together with bones provide more calcium and fluorine. Fish, liver and fish oils are rich in vitamin A and vitamin D although the amounts vary with age and species of fish (Latham, 1997).

Fish is also valuable indirectly because it can be a source of income. The income realized can then be used for purchase of other basic household necessities (Kent ,1987). Because of these reasons fish farming should be encouraged wherever water is available and people are willing to construct fish ponds.

There is general consensus that consumption of animal foods is considerably low in rural and poor households (Kikafunda, Walker and Tumwine, 2003; Nyambose, Kokki and Tucker, 2002). In Malawi localized studies in all the regions have also revealed low consumption of food of animal origin (Mtimuni, Geresomo and Bello 2007; Mtimuni et al 2008; Mtimuni and Geresomo 2009). To add to the burden of malnutrition are the high prevalence of HIV infection currently the prevalence is pegged at around 11%. Differences however exist between rural and urban areas. The entire country is affected and based on the sentinel sites. The link between nutrition and HIV and AIDS is well established (Fanta). It is a two way relationship and one worsens the other.

2. BASELINE SURVEY

The baseline survey was conducted to establish the food and nutrition situation and determine contribution of fish to diets in Ntchisi in the area of Traditional Authority Nthondo. The area was chosen because it is an area where our collaborator World Vision Malawi is working and one of the key interventions being implemented is fish farming. This intervention is currently being promoted to all households in Nthondo Area Development Programme (ADP). The baseline survey had two components: the basic nutrition survey and interactive 24 hour recall. The basic nutrition survey was conducted to:

- a) Assess nutritional status of children 6-59 months of age,
- b) Estimate the rates of morbidity in children 6-59 months,
- c) Estimate the mortality rate of children under 5 years of age and their causes,
- d) Estimate the crude mortality rate,
- e) Assess infant and young child feeding practices and;
- f) Assess the household food insecurity situation
- g) Assess dietary diversity at household level.

The basic nutrition survey was then followed by a more detailed interactive 24 hour recall based on Gibson (1992). The component targeted those households where fish farming had just been initiated by World Vision Malawi.

2.1. Survey Methodology

Prior to field work, a number of preliminary activities were undertaken which included; development of questionnaires, checklists, selection of clusters and recruitment of enumerators and data entry personnel. Training of the field staff for the survey was done by the researchers at Bunda College of Agriculture for 5 days. The training consisted of instruction in general interviewing techniques, and field procedures; a detailed review of items on the questionnaire, instruction and practice in weighing and measuring children, and pretesting of the instruments which was done conducted in a village five kilometers from Bunda. After the pre-test interviews, indepth discussions were held to find out areas that needed modification and further clarification and these were incorporated into the survey instruments. The survey was conducted in October and November 2008.

2.1.1. Sampling procedure

The current survey was conducted in the area of Traditional Authority Nthondo, Ntchisi district. This is the area where World Vision is operating and fish farming is one of the interventions being implemented.

A two-stage cluster sampling technique as recommended by the National Nutrition Survey Guidelines of Malawi (2002) was employed to select households that participated in the nutrition survey. The most up to date and detailed population data for Nthondo ADP was used. The cumulative population from the 24 Group Village Headmen was 4807.

Table 1: Population from sampled Group Village Headmen and villages by age group

GVH	Villages	<5 yrs	5-14 years	15-64 years	>65 years	Total Population
Nthondo	Kandodo	39	38	74	0	151
Kaponda	Mwalukira	34	36	56	2	129
	Msakachalo	40	56	63	0	146
Mandwe	Mandwe	39	58	69	3	169
Mndinda	Mndinda	40	41	72	3	146
	Gaweni	32	45	69	1	147
	Liwondwe II	47	49	70	3	169
	Chioza	42	55	68	0	165
	Khuntho	38	39	57	3	137
Sambakusi	Moto	43	52	65	3	163
Mnjale	Mnjale	34	49	60	3	163
Mpanang'ombe	Mpanang'ombe	32	50	65	2	149
Matalala	Kanjedza	32	59	61	2	154
	Chisala	35	51	71	4	161
Ngolomi	Gula	32	42	67	4	145
Chapulapula	Gideon	32	42	67	4	145
Ndaya	Bzyobzyo	36	48	67	0	151
Chikupila	Chikupila	39	40	61	4	144
Langa	Langa	39	45	60	4	148
Mataya	Mphanda	37	43	61	5	146
Msankhire	Msankhire	41	60	81	1	183
Chituza	Chinyonga	37	53	87	1	178
Mtawaila	Mtawaila	40	56	60	2	158
Nguluwe	Mchere	38	69	68	3	175
Khondowe	Nkhondowe	37	54	71	2	164
Chifwerekete	Chifwerekete I,II	32	61	62	3	160
Mtongo	Mtongo	45	38	62	2	129
Mngopi II	Mngopi II	45	38	67	1	151

Chitumbikwa	Nthenda	71	98	107	7	283
Chiziko	Chiziko	35	44	82	6	167
Total		1163	1505	2060	76	4807

2.1.2. Sampling of clusters and households

The selected clusters were assigned to each of the survey teams. In each selected cluster, the first household to be interviewed was randomly selected at village level, by spinning a pen or bottle. The direction of the pen/bottle was followed and the first household was randomly selected among the listed households falling in the predetermined direction. The next household was the one on the right hand side of the main entrance of the previous household. If the number of underfive children measured fell below 30 after visiting 30 households, then additional households were surveyed until the minimum required number of children was reached. In households where children were absent during the survey, the households were revisited. Each team of enumerators had a team leader who was responsible for sampling households.

2.1.3. Sample size

For this survey a total of 30 clusters (villages) were selected. The distribution of the clusters was based on the population sizes. In each cluster, a minimum of 30 households was surveyed giving a minimum total of 900 households and 900 children aged between 6-59 months in the three areas.

2.2. The nutrition survey

Administration of questionnaire and child measurement

The household questionnaire was administered to all selected households and mothers or caretakers were the target respondents. All children aged between 6 and 59 months in the selected households were measured. If the household did not have 6-59 months old children, only the household questionnaire was administered which captured, among other information, household demographics, mortality data, social economic status, and food security and dietary diversity information.

All children 6-59 months old were eligible for anthropometric measurements. Mid upper arm circumference (MUAC) measurements were taken from children aged 12 months and above.

2.3. Variables measured and precision of measurements

2.3.1. *Anthropometry*

Standard methods of taking anthropometric measurements were followed according to Gibson (2005) and Medicines Sans Frontiers (1995).

2.3.2. *Weight*

Weight for children under five years of age was measured in kilogrammes (kg) using a 25kg Salter scale. The scale was hooked on a strong sturdy beam and zeroed with the weighing pant on. The scale was hanged at eye level for the enumerator to take the readings. The weight was recorded to the nearest 0.1kg as soon as the indicator had stabilized.

2.3.3. *Height*

For infants and children under 24 month of age, recumbent length was measured to the nearest 0.1cm using a length board. For children aged 24 months of age and older, height was measured to the nearest 0.1cm.

2.3.4. *Mid upper arm circumference (MUAC)*

MUAC was measured in centimeters using children's MUAC tapes. The measurement was taken on the left arm at the middle point between the elbow and the shoulder, while the arm was relaxed. MUAC was measured and recorded to the nearest 0.1 cm.

2.3.5. *Oedema*

Bilateral Oedema is a measure of severe protein energy malnutrition (PEM), and is one of the signs of kwashiorkor. Thumb pressure was applied to each of the child's feet simultaneously for three seconds (just the time to say one thousand and one, one thousand and two, one thousand and three). If a pit remained on release of thumbs on both feet (bilateral pitting), the child was classified as having nutritional Oedema. Oedema does not have any cut-off points; however it is recommended that if >2% of children in a population have Oedema; relevant action should be taken without delay (Medicines Sans Frontiers, 1995).

2.3.6. *Other Study Variables*

Morbidity: Respondents were asked whether or not their children had suffered from any illness in the 2 weeks preceding the survey.

Mortality: In all households visited, the total number of persons 5 years and older, and those aged below 5 years was recorded. The respondents were then asked if in the 12 months preceding the survey, there were any deaths in the two categories of people. If death had occurred, the suspected causes of death were solicited and recorded. Determination of the mortality rates gives a good indicator of the access to health care and the sanitary condition in the population. The following mortality rates were determined:

- The Crude Mortality Rate (CMR) was calculated as follows;

$$\text{Mortality Rate} = n / [(n+N) + N] / 2]$$
 Where n = number of deaths in the last 12 months
 N = number of people alive on the day of the survey
 CMR is expressed per 10,000 people per day:

$$\text{CMR} = \text{MR} \times 10,000 / 365 \text{ days, as mortality data was collected over the previous 12 months.}$$
- The Under 5 Mortality Rate was determined as the CMR given above. The defined limits for mortality rates are as follows:
 - **Under 5 years mortality rate, (<5yrs MR),**
 2/10,000/day indicated an alarming situation.
 4/10,000/day indicated an emergency situation.
 - **Crude mortality rate, (CMR),**
 1/10,000/day indicated an alarm situation.
 2/10,000/day indicated an emergency situation.

Dependency ratio: in all households, household composition based on the following categories was determined:

- Children under five years of age = p
- 5 to 14.9 years of years = r
- 15 years and older = S
- The chronically ill = u
- The elderly unable to work = v

Dependency ratio was calculated using the following formula:

$$\text{Effective dependency ratio} = \frac{p + r + u + v}{S}$$

2.4. Food Insecurity and Dietary Diversity

The present survey included questions designed to solicit information on household food security and dietary diversity situation. The dietary diversity tool comprising of 17 food types including fish based on the Fanta/FAO tools, which in Malawi, were initially pre-tested in Mangochi and Mwanza (Mtimuni and Geresomo 2006).

2.5. Main Nutrition Indicators

In conformity with the national guidelines for nutrition surveys (MOH, 2003), acute malnutrition (wasting) was the main nutrition indicator used to monitor the effect of the nutritional uptake. The following definitions of acute malnutrition (wasting) based on measurement of weight-and-height were used:

Level	Definition
Global	< -2 weight-for-height z-scores of NCHS / WHO reference mean and / or bilateral pitting oedema.
Severe	< -3 weight-for-height z-scores of NCHS / WHO reference mean and / or bilateral pitting oedema.

The survey also used the definitions of acute malnutrition (wasting) based on measurement of mid-upper arm circumference (MUAC). MUAC is known to overestimate malnutrition rates in 6 to 12 month age groups. The analysis of MUAC data was, therefore, limited to children aged 12 months or older. Based on the current guidelines by Ministry of Health, MUAC is more linked to morbidity and care practices and is interpreted as follows:

- MUAC \geq 13.5 cm: satisfactory nutritional status
- MUAC \geq 12.5 cm and <13.5 cm: low risk of mortality, moderate risk of malnutrition
- MUAC \geq 12.0 cm and <12.5 cm: low risk of mortality, high risk of malnutrition
- MUAC \geq 11.0 cm and <12.0 cm: moderate risk of mortality and high risk of malnutrition
- MUAC <11.0 cm: severe risk of mortality and malnutrition.

Height for age, which is a measure of chronic malnutrition and weight for age, an indicator of both chronic and acute malnutrition, were also been used in the survey.

Household food insecurity access score (HFIAS) and household dietary diversity score (HDDS) based on the 6 food groups used in Malawi and expanded 12 food groups which isolate some special food such as vitamin A rich and iron rich foods have been included.

2.6. Data Collection, Entry and Analysis

Three interviewing teams comprising of four enumerators and a supervisor carried out the fieldwork for the survey. Data entry was done concurrently in the field as data was being collected. Data were double entered and analysed using Epi Info version 6.04b, a word processing, database and statistics programme for Public Health.

The results are presented as frequencies, proportions, ratios and nutrition indices. In order to assess the correlation between socio-economic status of the households and the rates of malnutrition, wealth indices were calculated and associations made between these and the nutrition indices. Households were classified as poor, better off, or rich based on asset possession.

2.7 Interactive 24 hour recall

A modified 24 hour recall methodology was utilized to collect food consumption in all the 98 households who had registered for fish farming through the Ntchisi RDP's Agricultural Extension Office of Ministry of Agriculture and Food Security) for Nthondo area. In each household, the youngest eligible child (1 – 10 years) and the mother were targeted for the dietary study and data was collected in October/November 2008.

The interactive dietary recall method has been developed to fill the need for a rapid, non-invasive dietary tool, one with a low respondent burden (Gibson and Ferguson, 2008). The method is easier, faster, and less expensive to use than the weighed method, and it is less invasive; therefore, respondent compliance is enhanced.

Requirements:

1. Local artist was commissioned to draw and label typical foods of the study area so that a food picture chart was created for the study area (Appendix 2). These were pre-tested before finalization using participants similar to those in Nthondo
2. A local artisan was hired to mold some food items of varying sizes that were commonly found in the study area (bananas, sweet potatoes, cassava, mangoes, potatoes, sugar cane, and pawpaw). Real food items of the same size were purchased and weighed to determine weight.
3. Local utensils (bowls, cups, graduated jugs, a set of standard measuring cups and spoons) were to enhance amounts. Cups were used to determine the volume of any

liquid served such as tea, sweet bear. Bowls were used to measure porridge, relishes and other mixed dishes.

4. Samples of commonly consumed staple food (Nsima of varying sizes) were prepared using wheat flour which was highly salted to preserve the food so that it lasted for several days. These were utilized to enhance amounts actually consumed.
5. Dietary recall forms

Training of enumerators

Two teams were deployed comprising of 4 enumerators and a team supervisor. These had some previous experience in well-conducted surveys and the baseline nutrition survey that had just been conducted in TA Nthondo. In fact the ones selected were those who had been observed to be open, personable, mature, nonjudgmental, sensitive to people and to mix well with the community. These were adequately trained for 7 days on how to conduct the 24 hour recall interviews and the probing that is required to ensure accuracy of the data collected. The training included actual pre-testing in a community similar to the study area.

Data collection

Since in each household a mother and the youngest eligible child (1 to 6 years) were targeted, one enumerator was scheduled to conduct the interactive 24 hour recall on one household per day only. Two visits were made to the household. On Day 1, the enumerator explained to the mother the purpose of the 24-hour recall which aims to document all food and drink from time they go to bed until time go to bed the following day. The respondent was then given the two food charts (one with baby face for the child and a plain one for the respondent) which she was asked to complete by ticking (√) the food as it is being eaten on the study day. In addition she was asked to use a separate bowl and plate for eating their food so that amounts eaten could be easily recalled on the recall day. She was then informed that the enumerator would return on third day to complete the recall interview. The respondent was therefore given two bowls, plates, two food charts and a pencil for marking the food chart calendar.

On day 3, the investigator visited the respondent to document the food the respondent ate the previous 24 hours guided by food chart that the respondent had ticked. For each food consumed the following information was determined together with the

respondent; time the food was consumed, ingredients for the food items, preparation method and quantities consumed. Quantities were determined using household measures which all the researchers moved with from one household to the next.

3. RESULTS AND DISCUSSION

3.1. Household Socio-economic Characteristics

The household demographic characteristics including household composition, age, sex, marital status; educational level and main occupation of household head as well as the average household size for the sample households are presented in Table 1.

Table 1: Households characteristics of surveyed households

Parameter	Ntchisi	
Sex of HH head	n	%
Male	699	76.6
Female	213	23.4
Marital status of respondents	n=912	%
Married monogamous	668	73.2
Married polygamous	157	17.2
Widowed	40	4.4
Divorced	38	4.2
Single	9	1.0
Orphan (<18 years)	0	0
Household Composition:		
Age category	Mean number (SD)	
< 5 yrs	1.3±0.7	
5-14 yrs	1.7±3.3	
15-64 yrs	2.2±1.0	
65+	1.4±0.5	
Mean household size	5.2±1.9	
Proportion of chronically ill	1.0±0.01	
Literacy rate^a	n	%
Household heads able to read or write	610	66.9
Respondents able to read or write	445	48.8
Level of education (%)	HH head (n=699)	Respondent (n=880)
Std 1-4	21.1	21.3
Std 5-8	36.0	30.6
Form 1-2	6.7	5.5
Form 3-4	7.9	3.4
Post secondary	0.5	0.0
Adult literacy	1.8	0.9
None	26.1	38.2
Main occupation (%)	HH head (n=699)	Respondent (n=880)
Farmer	86.0	90.2
Business	3.3	3.6
Trades/vocational	3.6	0.3
Casual labour	3.1	2.7
Wage employment	3.2	0.1
None	0.8	3.2

A total of 912 households were interviewed. The majority of the respondents (73.2%) were married in monogamous families hence most households were headed by men (76.6%). The average household size was 5.2 persons which is higher than the national average of 4.4 persons reported in the 2004 MDHS survey (NSO, ORC Macro 2005).

The results further show that a higher proportion of household heads (66.9%) could read and write while only 48.8% of respondents could read and write. Print media therefore may not be the most effective way of disseminating change messages in these communities.

Farming was the main occupation for the majority of the household heads (86.0%) and respondents (90.2%). Thus very few were engaged in petty trading and regular employment. Regular employment and businesses provide regular income to households which may ensure stability of household food supplies.

Presented in Table 2 is the age distribution of the sampled underfive children by sex. Categorizing of children based on age and sex helps in identification of the age groups and sex of children that are most vulnerable to food insecurity and malnutrition.

The results show that in general, the proportion of male to female children was equal (ratio of 1.0 for male to female children. This indicates that both sexes were adequately represented in the sample.

Table 2: Age Distribution of 6 – 59 months old children

Age group (months)	Boys		Girls		Total		Ratio
	n	%	n	%	n	%	M:F
6-17	135	51.9	125	48.1	260	25.2	1.3
18-29	128	52.7	115	47.3	243	23.5	0.9
30-41	112	48.7	118	51.3	230	22.3	1.0
42-53	122	54.7	101	45.3	223	21.6	1.2
54-59	29	38.2	47	61.8	76	7.4	0.6
Total	526	51.0	506	49.0	1032	100	1.0

3.2. Prevalence of malnutrition

Prevalence of malnutrition is presented by the type of manifestation that is; global acute malnutrition (GAM) and severe acute malnutrition (SAM), based on weight for height Z-scores. The results are presented in Table 3.

Table 3: Global and severe acute malnutrition by September 2008

Parametr	%
GAM (WHZ < -2 SD) + oedema	1.8% (0.5%- 0.2%)
SAM (WHZ <-3 SD)+ oedema	0.4% (0.0%- 1.0%)

CI (confidence interval) was computed at 95% i.e. 95%CI

Both GAM and SAM among children 6-59 months of age were low and within the acceptable range of less than 3% The situation however may change as the season progresses towards January and February 2009 which are the peak lean months.

Presented in Figure 2 are the detailed prevalence of acute (wasting), chronic (stunting) malnutrition and underweight in the area. Prevalence of stunting among the children was 49% was the same as that reported for Kalira EPA, Ntchisi (Mtimuni, Geresomo and Bello, 2007). This is higher than the national prevalence of 46% (Mtimuni and Kazembe, 2008).

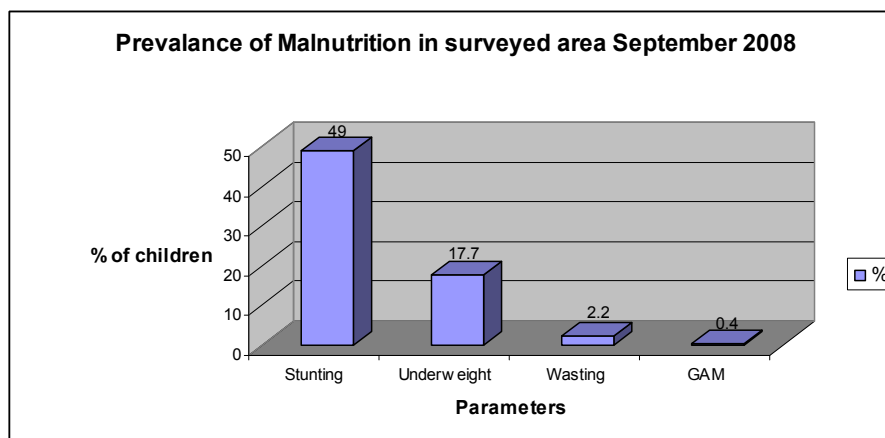


Figure 2: Prevalence of wasting, stunting, underweight, and global acute malnutrition

3.3. Acute Malnutrition by Age

The acute malnutrition rates were low in most age groups (Table 4). It is of concern however that among the 6 to 17 month age group, 3.9% were wasted (<-2 Zscore). This is a reflection of poor weaning practices.

Table 4: Distribution of weight for height by age group September 2008

Age group (months)	< -3 Z-Score (Severely wasted)		<-2 Z-Score (Moderately wasted)		≥ -2 Z-Score (Normal)	
	n	%	n	%	n	%
6 to 17	1	0.4	10	3.8	250	96.2
18 to 29	1	0.4	8	3.3	235	96.7
30 to 41	1	0.4	1	0.4	229	99.6
42 to 53	1	0.4	3	1.3	220	98.7
54 to 59	0	0	1	1.3	75	98.7
Total	4	0.4	23	2.2	1009	97.8

3.4. Chronic malnutrition

Prevalence of chronic malnutrition (stunting) among the children aged 6-59 months by age group is presented in Table 5. Prevalence of stunting was high even among the youngest infants and the effects appear to be cumulative so that there are no improvements even among the older children. A child once stunted may never achieve his/her genetically potential stature. The pattern is however similar to that reported in the 2006 MICS study where 28.8% of infants (6 – 11 months) were stunted and the prevalence increased to 50.7% for the 48 – 59 months old children (Mtimuni and Kazembe, 2008).

Table 5: Distribution of height for age by September 2008

Age group (months)	< -3 Z-Score (Severely stunted)		<-2 Z-Score (Stunted)		≥ -2 Z-Score (Normal)	
	n	%	n	%	n	%
6 to 17	30	11.5	106	40.8	154	59.2
18 to 29	54	22.2	115	47.5	128	52.7
30 to 41	42	18.3	122	53.0	108	47.0
42 to 53	46	20.6	116	52.0	107	48.0
54 to 59	19	25.0	47	61.8	29	38.2
Total	191	18.5	506	49.0	526	51.0

The possible contributory factors are early introduction of complementary foods, poor quality complementary foods that are fed infrequently and relatively high prevalence of morbidity as shown in Tables 11, 17, 18 and 19. Proper infant and young child feeding should be included in all health and nutrition education sessions in Nthondo.

3.5. Underweight

Weight for age assesses prevalence of underweight, which is an indicator of both chronic and acute malnutrition. Prevalence of underweight was 17.7% overall and 3.6% were severely underweight (Table 6).

Table 6: Distribution of Weight for age by September 2008

Age group (months)	< -3 Z-Score (severely underweight)		<-2 Z-Score (moderately underweight)		≥ -2 Z-Score (Normal)	
	n	%	n	%	n	%
6 to 17	14	5.4	52	20.4	208	80.0
18 to 29	13	5.3	52	21.4	191	78.6
30 to 41	4	1.7	37	16.1	193	83.9
42 to 53	5	13.5	35	15.7	188	84.3
54 to 59	1	1.3	6	7.9	70	92.1
Total	37	3.6	182	17.6	850	82.4

3.6. Crude and Underfive Mortality

Total number of underfive deaths and over-five deaths that had occurred over the twelve month period and the corresponding mortality rates are presented in Table 7. Determination of CMR (whole population) and UMR gives a good indicator of the access to health care services and sanitary conditions in which the population lives. Mortality rates were calculated as recommended by Save the Children Fund (2004).

The threshold for mortality are interpreted as follows:

Alert level = 1 death per 10,000 for CMR and 2 deaths per 10,000 for U5MR

Emergency level = 2 deaths per 10,000 for CMR and 4 deaths per 10,000 for U5MR.

The crude and underfive retrospective mortality rates were well below serious levels of concern as shown in Table 7.

Table 8: Twelve month retrospective mortality rates, September 2008

Category	Mortality rate
Under five*	0.31(0.03 – 1.11)
Crude**	0.35(0.24 – 0.45)

* Total deaths/10,000 people / day)

** Deaths in children under five/10,000 children under five / day

The main causes of underfive mortality were fever and malnutrition each accounting for 26.1% (Table 9). World Vision has worked in the area for some time in the areas of food security and nutrition. This may explain the ability of respondents to recall malnutrition as a cause of death. Among the five year olds and those older, persistent cough (40%) was the main cause of death and causes of the remaining 3 deaths were unknown. HIV/AIDS may significantly be contributing to both mortality and morbidity in this area since all the stipulated causes are interlinked with HIV/AIDS. Where causes are unknown, HIV and AIDS may play an important contributory role since problems of disclosure and denial still exist in the entire country.

Table 9: Causes of death in the households by age grouping

Causes of death	n	%
Children underfive:		
Diarrhoea	3	13.0
Fever	6	26.1
Cough with difficult breathing	3	13.0
Malnutrition	6	26.1
Unknown	5	21.7
5 years and above:		
Diarrhoea	1	10.0
Long illness	1	10.0
Persistent cough	4	40.0
Accident	1	10.0
Unknown	3	30.0

3.7. Child and adult morbidity

Frequent infections and illnesses is one of the immediate causes of malnutrition. During the survey, mothers and caretakers were asked if any of their children aged 6-59 months had suffered from malaria, fever with difficult breathing (ARI) and diarrhoea. The results are presented in Table 10.

Table 10: Prevalence of selected illnesses for children 6 -59 months 2 weeks before survey

Type of illnesses	n	%
Fever	276	30.3
Fever with difficult breathing	119	13.0
Diarrhoea	121	13.3

From the results, fever (proxy for malaria) was the main cause of illness followed by diarrhoea and fever with difficulty breathing. However, all these conditions have the effects of reducing food and nutrient intake and at the same time increasing the body's demand for nutrients.

During growth monitoring and promotion sessions management of diarrhoea is often covered since it is among the common problems among children. In the survey, respondents whose children were reported to have suffered from diarrhoeal were asked to recall actions they had taken to manage diarrhoea. The results are presented in Table 11.

Table 11: Management of diarrhoea, September 2008

Management	n	%
Continue breastfeed/ Increase food intake	5	8.8
Give salt/sugar solution	1	1.8
Go to health centre/post/hospital	45	78.9
Nothing	6	10.5

The majority of the mothers (78.9%) took their children who had diarrhoea to a health facility. It is of concern that some respondents did nothing to manage the diarrhoea. Proper and prompt action and management of these illnesses is critical to ensure quick recovery so that catch-up growth can be achieved after illness. Health education should therefore continue to be covered at every opportunity.

Table 12 presents information on attendance of growth monitoring and promotion for children aged 6 to 59 months by district. It is of concern that 15.1% of the underfive children have never been taken for growth monitoring and promotion (GMP). By implication it means that they have not been immunized against the tuberculosis, polio, pertosis, tetanus, measles which are given at GMP. In addition, such children are denied the biannual vitamin A supplements, biannual deworming and their mothers miss out on the health and nutrition messages expected to be included as part of GMP.

Table 12: Attendance of growth monitoring and promotion

Parameter	n	%
Ever visited growth monitoring clinics	774	84.9
Still attending growth monitoring clinics	698	76.5

3.8. Prevalence of dietary related non-communicable diseases

In Malawi, prevalence of dietary related non-communicable diseases is not known since no systematic studies have been conducted. From hospital reports however, incidences seem to be on the increase. During the survey, respondents were asked if there were any adults who were suffering from such disorders. The results from the responses are presented in Table 13.

Table 13: Prevalence of selected dietary related non-communicable diseases

Chronic disorder	N	%
High Blood pressure	16	1.8
Diabetes	2	0.2

Prevalence of high blood pressure was higher than that of diabetes mellitus. The prevalence for each of these disorders may be higher than the rates presented here, since the majority of the respondents may not have been tested for these disorders. These findings are similar to those found in Kasungu, Mzimba and Phalombe livelihood zones and reported in both the May 2008 and December 2008 MVAC surveys (Mtimuni, Geresomo and Bello, 2008).

3.9. Infant and Young Child Feeding

Adequate nutrition is the cornerstone for survival as it is key to health and development for current and future generations. Well-nourished children perform better in school and grow into healthy adults. Nutrition also plays a critical role in determining an individual's health status and ability to avert and overcome illness. Infant and young child feeding practices were also investigated in this study.

Table 14 presents mean age and sex distribution of the eligible youngest children (6-59 Months) that were captured during the survey. The results further show that there was even sex distribution among children in all the three survey areas with a sex ratio of almost 1.0. Hence both sexes were adequately represented.

Table 14: Age and sex of youngest eligible child

Parameter	n	%
Mean age (month \pm SD)	25.6 (13.9)	
Sex of youngest eligible child		
Male	526	51.0
Female	506	49.0

Information on breastfeeding practices that were followed for the youngest child is presented in Table 15.

Table 15: Breastfeeding practices for the youngest underfive children

Parameter	%
Period baby put to the breast:	
Within the first hour	79.0
After the first hour	20.1
Never	0.6
Don't know/remember	0..3
Other practices:	
Child received colostrums	84.5
Child ever breastfed	84.4
Child currently breastfed	45.0
Child ever bottle fed	6.0

Breast-feeding is practically universal and this is true for Malawi, the results show that the majority of the children had been put to the breast within the recommended period after birth. It is pleasing to note that at least 84.5% of all children received colostrum after birth although this is based on the mother's recall. Colostrum is essential for building up immunity in newly born babies to protect them from the common childhood illnesses.

The results also show that only a small proportion of mothers (6%) ever bottle fed their children. This practice is discouraged since it is difficult under village conditions to keep the bottles sterile. All extension workers should be encouraged to include appropriate infant and child feeding practices in health and nutrition sessions so that most mothers adopt the essential nutrition actions (ENAs) when caring and feeding their children (MOH, 2008).

While breast-feeding was practiced by most mothers, the results show that exclusive breast-feeding is not universally practiced (Table 16).

Table 16: Period complementary foods were introduced

Parameter	%
One month	7.3
Two months	2.6
Three months	4.7
Four months	15.1
Five months	14.9
Six months	36.8
> Six months	3.4

A significant proportion of mothers (44.6%) had introduced complementary foods to their youngest children before the age of six months. It is of grave concern that some of them had actually introduced other foods even within the first month of birth. Even those who had indicated to have introduced at the correct age, this may actually be a reflection of knowledge rather than practice. An in-depth study will have to be conducted to establish the actual prevalence of exclusive breast feeding and unearth the factors that motivate the current feeding practices or act as constraints to improving feeding practices.

Presented in Table 17 are the types of foods and liquids that were introduced as complementary foods. Vitamin and mineral supplement really refer to vitamin A supplement that is given biannually by Ministry of Health for children age 6 months and older. Fruit juice is likely to be the sweetened and artificially coloured drinks. Thus most of the foods used were nutritionally inadequate.

Table 17: Type of complementary foods and liquids introduced

Type of food given since the child was born	%
Vitamins, mineral supplements	76.3
Plain water	82.1
Sweetened /flavoured water	59.3
Tea or infusion	57.9
Fruit juice	40.6

Infant formula	9.5
Tinned, powdered or fresh milk	26.5
Other liquids	70.7
Porridge	75.1
Mashed food	70.7

Time of introducing complementary foods is a critical period in the lives of children because this is a period that the children are learning to eat new types of food and at the same time are exposed to the danger of infectious microorganisms if the weaning foods are contaminated. Weaning foods should therefore be handled hygienically and introduced at an appropriate time.

In addition to appropriate introduction of complementary foods, meal frequency is equally important for adequate food and nutrient intake to ensure proper growth and development of the children. Table 18 presents information on complementary feeding of youngest child.

Table 18: Complementary feeding practices of youngest child day before survey

Parameter	n	%
Children who received food previous day	757	83.0
Meal frequency previous day:		
Once	64	7.0
Twice	386	42.3
Three times	289	31.7
Four times	18	2.0
Five times	2	0.2
More than 5 times	1	0.1
Type of food given to youngest child previous day:		
Staple (cereals, roots, tubers, plantains)	757	83.0
Fruits	79	8.7
Vegetables	642	70.4
Legumes	211	23.1
Animal/fish foods	149	16.3
Fats/sugar	235	25.8
Prepared special meals for child	305	33.4
Special meal composition (n=305):		
Staple (cereals, roots, tubers, plantains)	284	31.1
Fruits	59	6.5
Vegetables	75	8.2
Legumes	56	6.1
Food from animals	38	4.2

Fats/sugar	122	13.4
Reasons for not preparing special meals (n=466):		
Don't know how to do	3	0.3
Lack of time	151	16.6
Lack of food	250	27.4
Child sick	6	0.7
Lack of money	52	5.7
Other	4	0.4

The results show that meal frequency was low since the majority of households fed their children three times or less per day. This is too low for the children to get the required nutrients from the typical bulky Malawian diet comprising of the staple eaten with vegetables all of which have low energy and nutrient density. The National Guidelines for complementary feeding recommend that young children should be fed four to six times per day to meet their nutritional requirements. It is important that children should be fed adequately all the time for proper growth and development.

Some mothers prepared special meals for their children. The majority of meals were prepared from staples. Mothers who failed to prepare special meals for their children indicated “lack of food” as the main reason for do so. Care givers and mothers should be encouraged to prepare multi-mix complementary foods. These are likely to be more nutritious than the plain staples.

Consumption of varied types of foods and meal frequency are a measure of food availability and access as well as dietary diversity at household level. Low meal frequency may lead to poor nutrition and deterioration of general health of household members.

3.10. Dwelling Unit, Water and Sanitation

The type of material used for flooring of dwelling house is not only an indicator of the economic standing of the household but is also an indicator of potential exposure to disease-causing organisms. Overall, 98.1% of all households live in residences with floors made of earth, sand, or dung, while only 1.9% live in houses with finished floors made of cement.

Table 19: Main materials for the dwelling house and households assets

Parameter	%
Main materials for dwelling house	
Eath, sand /mud	97.7
Dung	0.4
Cement	1.9
Number of rooms for the dwelling house	
<2 rooms	9.0
2-3 rooms	71.8
4 rooms and above	19.1
Household assets	
Electricity	0.7
Radio	54.2
Television	0.7
Refrigerator	0.1
Bicycle	32.7
Motorcycle	0.2
Car or truck	0.4
Main sources of fuel household use	
LPG natural gas	0.1
Charcoal	0.1
Firewood	99.7

3.11. Water and Sanitation

Safe drinking water and appropriate sanitation facilities are basic necessities for good health. Since water can be a significant carrier of diseases such as cholera, typhoid and other diarrheal diseases. Drinking water can also be tainted with chemical, physical and radiological contaminants with harmful effects on human health. In the survey area, most of the households (78%) obtained drinking water from improved water sources since they used one of the following types of supply: public tap, borehole or protected well. However, the water is likely to be contaminated since most of the households do nothing to maintain its safety while in the home (Table 20).

Table 20: Main sources of drinking water

Parameter	%
Main sources of drinking water:	
Public tap	0.1

Borehole with pump	76.5
Protected dug well	0.5
Unprotected dug well	13.0
Unprotected spring	0.8
Pond, river, stream	9.0
Caring for drinking water:	
Do nothing	89.2
Boiling	7.0
Add chlorine	3.7
Drying table for dishes:	
Household having drying table	12.9
Household having pit for waste disposal	26.5
Activities often followed with hand washing with soap:	
Before handling food	13.7
Before feeding a child	10.9
Before breastfeeding a child	7.5
Before eating	91.0
After attending to a child who has defected	14.4
After changing child nappies	15.1
After visiting a toilet	16.4

Modern sanitation facilities are not yet available to a large proportion of households in Malawi, particularly in rural areas. Inadequate disposal of human excreta and personal hygiene is associated with a range of diseases including diarrhoeal diseases and polio. *Improved sanitation facilities* include: flush toilets connected to sewage systems, septic tanks or pit latrines, ventilated improved pit latrines and pit latrines. From the results presented in Table 21, the use of traditional pit latrines is still common accounting for 84.4% of the households which compares well with 79%, the national figure for rural areas (NSO and ORC Macro, 2005). Most of the toilet facilities (74.1%) were located within the dwelling area.

However, it is of grave concern that 12.7% did not have any toilet facilities and a significant proportion of the households (11.3%) failed to properly dispose of their young children excreta. The inadequate sanitary conditions prevailing in the area may have contributed to the relatively high incidence of diarrhoeal diseases (13.3%) the young children had suffered from two weeks before the survey.

Table 21: Waste disposal

Parameter	%
Type of toilet facility household have	
Flush to sewage system	0.1

Pour flush latrine	0.1
Improved pit latrine (VIP)	1.9
Traditional pit latrine	84.4
No facilities or bush or open pit	13.5
Location of toilet :	
Within dwelling compound	74.1
Outside the dwelling compound	13.4
Disposal of young children (0-3 years) stools:	
Children always use toilet	2.0
Thrown into toilet	61.8
Thrown outside the yard	10.7
Buried in the yard	0.6
No young children in the household	24.8
Presence of hand washing facility close to toilet	2.0

3.12. Household food security

For a household to be food secure, its members should have access to adequate and nutritious foods all the time. Households may access food through own production or purchasing. During the survey, respondents were asked to indicate their main sources of food and the results are presented in Table 22.

Table 22: Main Source of food for households

Food Source	Ntchisi	
	n=910	%
Own food production	604	66.2
Purchased food	260	28.5
Borrowed food	1	0.1
Food gift	8	0.9
Ganyu	34	3.7
Food for work	3	0.3

Quite a significant proportion of households mainly relied on purchased food in September. Unless household income was adequate, such households are likely to be food insecure. In fact over one half of the households had sought Ganyu (60.7%) compared to 16.6% who had offered Ganyu in the last 12 months.

Vegetable production is one of the ways that households can increase incomes and directly improve food availability and access. Table 23 presents information on vegetable garden ownership and use of the vegetables by households. The majority of households did not have vegetable gardens. However, it is encouraging that about

33% of households had vegetable gardens. Maintaining a vegetable garden throughout the year would significantly increase their food base; contribute to dietary diversification and household income.

Table 23: Ownership of vegetable garden and type of vegetables grown

Parameter	%
Ownership of vegetable garden:	
None	67.0
Yes, homestead/backyard	3.3
Yes, close to river/dam	29.7
Type of vegetables grown:	
Bonongwe	2.2
Kamganje/mpiru/Chinese/Tchomolia/Rape, Nkhwani	65.3
Cabbage	4.1
Carrot	1.1
Okra	1.1
Others (onions and Tomato)	26.1
Use of vegetables grown:	
Consumption	74.6
Sales	25.4
Mean sales in previous month (MK)	1410.50

It is commendable that most of the vegetables grown were rich in Vitamin A and furthermore, most of the vegetables were for home consumption (74.6%). A significant proportion (25.4%) also had surplus for sale.

It is of concern that the majority of the households (67%) did not have a vegetable garden despite the fact that the entire ADP has rivers and springs hence suitable for establishing vegetable gardens. These should be integrated with fish farming.

Seventy percent of the households in Nthondo owned livestock and the average number of the different types of livestock owned are presented in Table 24.

Table 24: Livestock ownership in Nthondo ADP

Parameter	%
Households with livestock	70.0
Mean livestock numbers per household:	
Cattle	0.16
Goats	2.3
Sheep	6.2
Poultry	5.7

Pigs	0.9
Other small animals	2.2

The ADP has undulating hills and valleys with numerous springs and rivers. Therefore the area has great potential for fish farming and vegetable growing. In fact World Vision is promoting households to engage in these activities as a feasible means of ensuring household food security all year round. Respondents were asked whether or not they were engaged in the two activities. Presented in Table 26 are results related to fish farming. Only 2.3% of the respondents had functioning fish ponds which had existed for about 6 years on average.

Fish harvesting was conducted twice per year and most of the fish (69%) were sold (Table 25). There is room for improvement in the current project activities. These include proper management of ponds to increase fish production so that utilization of fish in the home can also increase.

Table 25: Fish farming Activities in the ADP

Parameter	Response
Households with functioning fish ponds	2.3%
Mean number of fish ponds	1.6
Sources of fish fingerings:	
World Vision	79.2%
Fellow farmers	20.8%
Mean number of years fish ponds in existence	6.1
Average number of fish harvested	57. (81.1)
Mean number of times fish harvested	2.0
Main use of fish products:	
Consumption	31.0%
Sales	69.0%
Mean sales in previous harvest (MK)	3337.50

3.13. Household food insecurity scale and dietary diversity

Food security is a complex and multidimensional concept therefore its assessment/measurement is problematic, technically difficult and data collection costly. In the current survey household food insecurity access scale (HFIAS - comprising of 9 questions) originally developed by FANTA and being promoted by FAO were used. These had already been pre-tested in Malawi in 2006.

The tool is based on the principle that experience of food insecurity causes some predictable reactions and responses (Coates, Swindale and Bilinsky, 2006). It is based

on the principle that experience of food insecurity causes predictable reactions and responses that can easily be captured and quantified through a survey. The results can then be summarized into the food secure and those who are food insecure. Food insecure households can be classified as mildly, moderately or severely food insecure.

The second tool that was included is a measure of dietary diversity (DD). It refers to the number of different food groups consumed by an individual or by any member of a household over a 24-hour period. It is a good indicator to use because a more diversified diet is associated with a number of positive outcomes such as child nutritional status, birth weight. In addition a more diversified diet is highly correlated with energy and protein adequacy, percentage of high quality protein (animal sources) and household income (Swindale and Bilinsky, 2006). In this survey, the household DD score is reported. However, the tool can be used to collect information at both individual and household level.

3.14. Household Food Insecurity Access Scale (HFIAS)

Respondents were asked each of the 9 HFIAS questions (Module E) and the responses are presented in Table 26.

Table 26: Responses to the 9 HFISA questions

Parameters	Never	Rarely	Sometimes	Often
	%	%	%	%
Q1 Ever worried that food not enough	45.0	35.7	16.8	2.5
Q2 Not able to eat preferred foods:	51.0	33.1	14.4	1.5
Q3 Ate limited types of food (no diverse diet):	31.9	38.0	18.6	11.4
Q4 Ate foods not preferred:	54.9	31.7	11.8	1.5
Q5 Ate smaller meal (reduced portion):	55.4	31.0	12.7	0.9
Q6 Reduce meal frequency:	52.9	37.0	9.2	1.0
Q7 Had no food at all in house:	80.6	16.9	2.2	0.3
Q8 Go to bed hungry:	82.5	15.9	1.6	0.0
Q9 Members did not eat all day:	93.1	6.4	0.5	0.0

The most critical questions are the last three which indicate vulnerability of households to poverty and food insecurity. Table 27 presents the wealth groups identified in the area.

Table 27: Wealth ranking by September 2008

Rank	n	%
1 poor	390	42.8
2 ave	360	39.5
3 rich	162	17.8
Total	912	100

Households seriously experiencing hunger and were the relatively poor (Table 27) where some members stayed the whole day without eating and those who had no food for a whole day and night. The results for the two categories are presented in Figure 4. Although the majority of the households were relatively well off at the time the situation may change during the period extending from December to February.

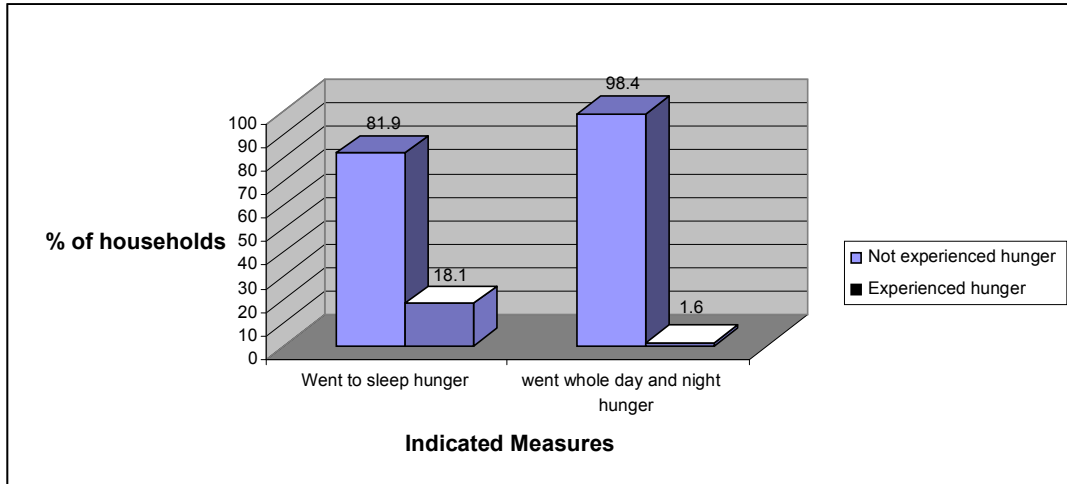


Figure 4: Household poverty and hunger

Figure 5 show that most of those who experienced hunger were the poor households, which was determined utilizing the wealth index that had been created best on information of household assets collected.

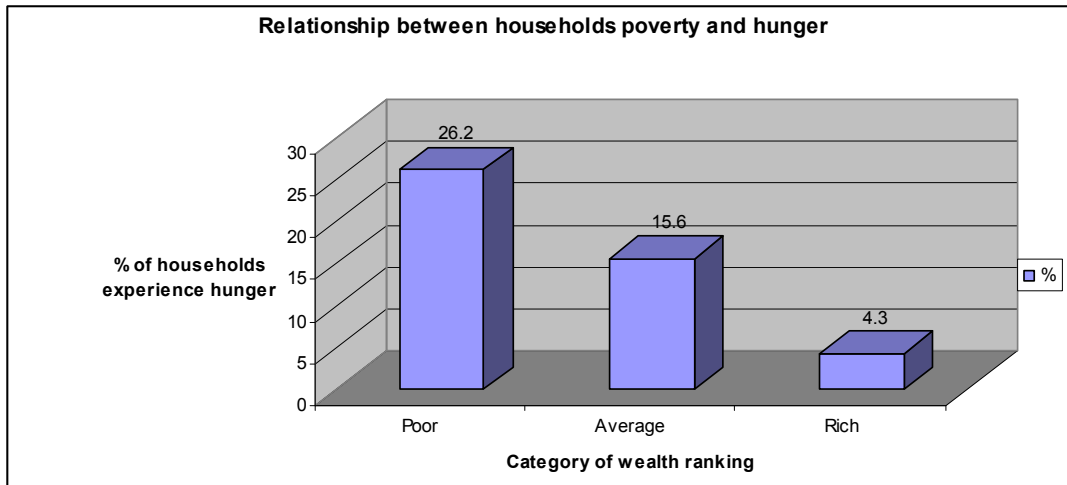


Figure 5: Relationship between household poverty and hunger

3.15. Household dietary diversity score

Respondents were asked to report all foods that any person ate at home on the previous day to assess their dietary diversity based on Module E of the survey questionnaire. The foods were categorized into 12 food groups from the original 17 as recommended by FANTA, and households were assigned to a dietary diversity level according to the number of food groups they ate the day before the survey that

is; low (3 or less), medium (4 or 5 food groups) and high (6 or more food groups). Table 28 presents the proportion of households in each dietary diversity level.

Table 28: Proportion of households in each DD level

DD Level	n	%
1 = Low DD	391	42.9
2= Medium DD	360	39.5
3=High DD	161	17.7
Total	912	100

The results show that the main stay of the diet is cereal since it is the main staple eaten with vegetables particularly for households with low dietary diversity (LDD). As dietary diversity improved, more costly foods, that is, animal foods were included in the diet as well (Table 29).

Table 29: Consumption of the 12 food groups and beverages by level of diversity

Food group	Parameters		
	Low DD	Medium DD	High DD
Cereals	99.1	100	100
Tubers	1.9	13.2	53.2
Vegetable	94.9	97.8	100
Fruit	3.7	17.6	17.2
Meat	3.3	18.1	44.8
Eggs	0.4	5.7	14.7
Fish	3.0	18.5	32.8
Legumes	25.8	58.1	58.6
Milk	0.6	4.0	39.7
Oil	1.4	31.3	78.4
Sweets	4.9	51.1	74.1
Spices	9.7	22.5	42.2
Soft beverage (Coffe, tea)	12.1	30.8	44.0
Alcohol (beer, kachasu)	6.5	10.1	16.4

Consumption of alcoholic beverages also increased and this may be an underestimate since some of male household members were not willing to disclose. The actual types of foods predominately eaten by at least 40% of the households at different levels of dietary diversity for the whole survey population are shown in Table 30.

Table 30: Typical foods consumed day before the survey by dietary diversity level

Lowest dietary diversity (≤ 4 food groups out of 12)	Medium dietary diversity (4 or 5 out of 12)	High dietary diversity (≥ 6 food groups out of 12)
Cereals	Cereals	Cereals
Vegetables	Vegetables	Vegetables
	Fruit	Fruit
		Tubers
		Oils and fats
		Sweets
		Spices, tea, etc
		Alcoholic beverages

Use of 12 food groups makes it possible to measure consumption of highly nutritious foods such as vitamin A rich foods, iron rich foods or animal foods. Figure 6 shows the dietary diversity categories of households in the three surveys areas and compares this to their consumption of animal source iron-rich foods.

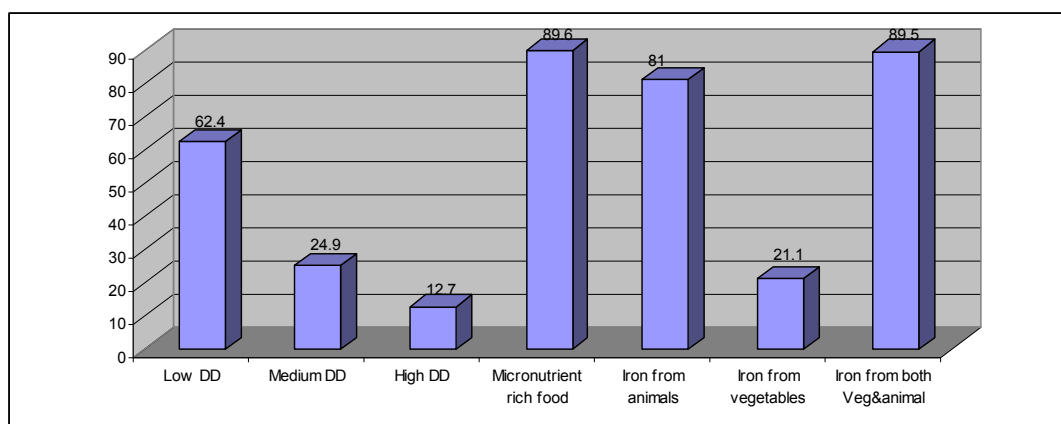


Figure 6: Household dietary Diversity levels and consumption of iron-rich animal foods

In Malawi, food has been grouped into six groups, which the Malawi nation is expected to use as a guide to ensure a diversified diet likely to meet energy and nutrient requirements. The 17 food groups were therefore regrouped to the 6 food groups, which are: Staples (cereals and roots and tubers and plantains); Legumes; vegetables; fruits; animal foods and fats/oils. These were then categorized as follows to measure dietary diversity; low (2 or less), medium (3 food groups) and high (4 or

more food groups). Presented in Table are findings based on both the 6 food groups and the 12 food groups.

Table 32: Dietary Diversity based on 6 and 12 food groups

Dietary diversity level	6 Food groups	12 food groups
Low DD	46.5	62.4
Medium DD	35.0	24.9
High DD	18.5	12.7

The results show that use of 6 food groups overestimate dietary diversity and underestimate those who have low dietary diversity. The six food grouping is probably too simplistic and this may be the right time to re view the guideline.

The traditional way of obtaining the dietary diversity based on 6 food groups is to ask respondents whether they or anyone in the household ate food the previous day from six listed food groups (list-based approach). In contrast, the 12 food group dietary diversity score is obtained by asking respondents to recall all foods eaten during meals or for snacks by themselves or others in the household the previous day. When a DD6 score was created using the recall data, the mean number of food groups (3.4) was higher than the mean number of food groups reported using the list-based approach (3.12). This implies that respondents reported more foods when the recall approach was used, most likely because they were prompted about snacks and mixed-food dishes.

3.16. Interrelationships between the dietary indicators and nutritional status

An attempt was made in the analysis of data to test existence of associations between various indicators. The results show some positive outcomes. There are more food secure households and fewer severely food insecure households in male-headed households ($p < 0.001$) compared with female headed households. This indeed confirms the vulnerability of female-headed households to food insecurity and malnutrition.

The severely food insecure households have the lowest dietary diversity ($p < 0.001$) and they consume fewer iron rich foods than other households. Food secure households on the other hand consumed both more vitamin A rich foods and iron rich foods than severely food insecure households (< 0.001). However the proportion of households who consumed iron rich foods were practically the same among the food secure, mildly food insecure and the moderately food insecure households.

Stunting is a chronic malnutrition indicator (long term) of poverty and malnutrition. It has remained high in Malawi for a long time. It is the only nutrition indicator that showed association with HFIAS as shown in Table 32 where it is clear that stunting goes up as food security status declines ($p < 0.05$). There were no observed relations between HFIAS and either underweight or wasting. Likewise, a significant trend was observed of lower stunting prevalence with increased dietary diversity ($p < 0.05$).

Table 32: HFIAS with stunted Cross tabulation

Status	Normal	Stunted	Total
Food Secure	50.6%	49.4	100.0%
Mild Food Insecure	63.6%	36.4%	100.0%
Moderate Food Insecure	48.4%	51.6	100.0%
Severe Food Insecure	52.5%	47.5%	100.0%
Total	51.5%	48.5%	100.0%

PART 11: DETAILED 24 HOUR INTERACTIVE RECALL

A total of 90 households had registered for fish farming activities in the study area. These households were included in the baseline survey. Food consumption of the youngest eligible child (1 to 6 years) and mother was collected using the interactive 24 hour recall as described in the methodology. The food consumption data was converted to energy and nutrient values using NutriSurvey 2007 for windows computer package. To this effect the children were divided into two groups (1 – 3 years and 3 – 6 years) while mothers were divided into four groups (19 – 24 years, 25 – 50 years, 51 – 65 years and >65 years). The grouping is based on the groupings of the computer package used for analysis. Presented in Table 33 are the details of the sample size.

Table 33: sample size for interactive 24-hour recall by age grouping

Age category	n	Mean weight	Mean height
1 – 3 years	34	12.1	84.7
4 – 6 years	30	16.7	96.9
19 – 24 years	16	55.5	-
25 – 50 years	50	58.4	-
51 – 65 years	19	57.9	-
>65 years	4		-

The details of the interactive 24 hour recall and the findings have been presented in a separate report “Contribution of fish to food and nutrition security in T/A Nthondo Ntchisi district, central Malawi “

4. CONCLUSION AND RECOMMENDATIONS

The findings have revealed that acute malnutrition was within the acceptable ranges but chronic malnutrition was widespread among the underfive year old children. This problem is serious and persistent in Malawi and any nutrition intervention should aim at curbing the problem. The contributory factors include presence of such diseases as diarrhoea, respiratory infections, malaria which is also endemic in Malawi, low dietary diversity, food insecurity and poverty coupled with inadequate access to health facilities.

It should also be noted that most of the diseases were preventable. Promotion of use of chemically treated bed nets may reduce the prevalence of malaria while education on importance of using safe drinking water, sanitary facilities may reduce prevalence of diarrhoea and encouraging mothers to have their children vaccinated against the six immunizable diseases such as measles and whooping cough may also reduce child mortality significantly. For the entire family, promotion of appropriate health practices and health facility seeking behaviour among household members would help to prevent some of the diseases that caused some of these deaths.

In this regard, prevention, control and treatment of parasitic and infectious diseases would assist to control malnutrition and improve the nutritional status of children and other household members. Nutrition related non-communicable diseases are also becoming common and affecting a large proportion of adults in Malawi.

Dietary and child feeding practices were inappropriate in that the foods were low in energy and nutrient density. It is likely that poor dietary practices contributed much to the high prevalence of malnutrition among the under five children. Providing training to mothers and household members on appropriate dietary practices will help to improve the situation.

The area has potential for fish farming; the initiative taken to promote fish farming is commendable. It is likely to be successful since there are other households who have tried it.

With this background in mind, it is prudent to seriously consider intensifying efforts aimed at alleviating malnutrition, and some of the possible ways are suggested in addition promoting fish farming to ensure that the benefits translate into improved food and nutrition security:

- a. There is need to develop an effective nutrition surveillance system that will help to generate information that can be used for planning and implementing targeted nutrition and food security programmes that aim at improving the nutritional status of communities.
- b. Conceited effort must be applied towards improving family food security. In this regard, special attention should focus on the increased production and ultimate consumption of diversified and locally grown but nutrient-dense foods.
- c. Where cultivable land availability is a constraint, and the acquisition of high technology farming systems and /or crop diversification is still elusive, households should be assisted to diversify to off-farm income generating activities.
- d. Rigorous campaigns should be mounted towards improving hygienic and sanitary domestic conditions, especially ownership and use of safe latrines to prevent infectious diseases that contribute to ill health and malnutrition.
- e. All extension workers should be encouraged to include appropriate infant and child feeding practices in health and nutrition sessions so that most mothers adopt the essential nutrition actions (ENAs) when caring and feeding their children

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APPENDIX 1: BASELINE NUTRITION SURVEY IN NTCHISI – NTHONDO ADP
September 2008

MODULE A : IDENTIFICATION			
A1	Day/Month/Year of Interview / ___ / ___ / 2008	A6	Cluster No. / ___ / ___ /
A2	ADP Name	A7	Household No. / ___ / ___ / ___ /
A3	District Name.....	A8	Enumerators Name
A4	TA Name.....	A9	Supervisor NameSign.....
A5	Village Name		

MODULE B : HOUSEHOLD SOCIO-ECONOMIC CHARACTERISTICS		
Household Composition		
B1	Household Head Name (Decision maker)
B2	Household Head Sex	Male1 Female2
B3	Household Head Age (in completed years)	/ ___ / ___ /
B4	Marital Status of Household Head	Currently Married - monogamous.....1 Currently Married - polygamous.....2 Widowed.....3 Divorced.....4 Single.....5 Orphan (under 18 years of age).....6
In answering B5 to B10 exclude visitors (< 2 weeks)		
B5	Total Number of members in this HH Total Number of people 15 to 64 Yrs	
B6	Total Number of children under 5 Yrs	
B7	Total Number of children 5 to 14 Yrs	
B8	Total Number of people 15 to 64 Yrs	
B9	Total Number of people above 65 Yrs	
B10	Total Number of chronically ill in this HH (Over one month)	
Education		
B11	Household Head can read or write	Yes1 No.....2

B12	Respondent can read or write	Yes1 No..... 2	
B13	Level of Education of HH Head	Std 1-4..... Std 5-8.....2 Form 1-2.....3 Form 3-4.....4 Post secondary.....5 Adult literacy.....6 None.....7	
B14	Level of Education of Respondent	Std 1-4.....1 Std 5-8.....2 Form 1-2.....3 Form 3-4.....4 Post secondary.....5 Adult literacy.....6 None.....7	
Household Occupation, Assets and Food Security			
B15	Household Head Main Occupation	Farming..... 1 Business2 Trades/vocational skills.....3 Casual labour.....4 Wage employment.....5 None.....6	Other (specify).....
B16	Respondent main occupation	Farming..... 1 Business2 Trades/vocational skills.....3 Casual labour.....4 Wage employment.....5 None.....6	Other (specify).....
B17	Did any household member seek ganyu since last growing (last 12 months)	Yes1 No..... 2	
B18	Did this household offer ganyu to anyone since last growing season (last 12 months)	Yes1 No..... 2	2⇒ B20
B19	How often did you offer ganyu since last growing season (last 12 months)	/ ___ / ___ /	
B20	Does the household have livestock	Yes.....1 No.....2	2⇒ B22
B21	Household livestock numbers	Cattle___/___ Goats___/___ Sheep___/___ Poultry___/___ Pigs/___/___ Other small animals___	
B22	Does the household have functioning fish ponds	Yes.....1 No.....2	2⇒ B29
B23	How many fish ponds does the household have	_____	
B24	For how long does has the household have fish ponds (Completed years)	_____Years	45

B25	Where does the household get the fish fingerings?	World Vision Fisheries Department (Government) From fellow farmers Other specify_____	
B26	On average how much do you harvest (Kgs)	_____.	
B27	How many times do you harvest per year		
B28	Main use of harvested fish	Consumption..... 1 Sales..... 2 Gift..... 3 Other specify.....	2⇒ B29
B29	Average amount of sales?	/ ___/ ___/ ___/ ___/ ___/ ___MK	
B30	Household vegetable garden	No.....1 Yes, homestead.....2 Yes, close to river/dam.....3	1⇒ B34
B31	Type of vegetables grown in the garden Yes.....1; No.....2	Bonongwe___ Tomato____ Okra____ Onions___ Carrots____ Kamuganje_____ Tchomolia_____ Rape_____ Mpilu_____ Cabbage_____ Chinese Cabbage_____ Other specify_____	
B32	Main use of vegetable products	Consumption..... 1 Sales..... 2 Gift..... 3 Other specify.....	2⇒ B33

B33	Amount of sales during last month	/ ___/ ___/ ___/ ___./ ___/ ___MK	
B34	Current household main source of food	Own Food Production.....1 Purchased Food.....2 Borrowed Food.....3 Food Gift.....4 Food Aid.....5 Ganyu6 Food for work.....7 Other (specify)_____	
B35	Main material of the dwelling floor?	Natural Floor: Earth/sand/mud1 Dung.....2 Finished Floor: Tiles.....3 Cement.....4 Carpet.....5	
B36	Number of rooms in dwelling unit / ___/		
B37	Does your household have: A. Electricity? B. A radio? C. A television? D. A refrigerator?	No A. Electricity.....1 B. Radio.....1 C. Television.....1 D. Refrigerator.....1	Yes 2 2 2 2
B38	Does any member of your household own: A. Bicycle B. A motorcycle C. A car or truck	No A. Bicycle1 2 B. Motorcycle.....1 2 C. Car or truck.....1 2	Yes
B39	What type of fuel does your household mainly use for cooking?	Electricity1 LPG/natural gas.....2 Biogas.....3 Kerosene.....4 Coal, lignite.....5 Charcoal.....6 Firewood, straw.....7 Dung.....8 Other specify.....	

WATER AND SANITATION		
B40	What is the main source of drinking water for members of your household?	Piped water dwelling.....1 Piped into yard or plot.....2 Public tap.....3 Borehole with pump.....4 Protected dug well.....5 Protected spring.....6 Rainwater collection.....7 Unprotected dug well.....8 Unprotected spring.....9 Pond, river or stream.....10 Tanker-truck, vendor.....11 Other specify _____
B41	How long does it take to go there, get water, and come back?	No. Minutes.....__ __ — Water on premises.....888 Don't know.....77
B42	What kind of toilet facility does your household use?	Flush to sewage system or septic tank.....1 Pour flush latrine (water seal type).....2 Improved pit latrine (e.g VIP).....3 Traditional pit latrine.....4 Open pit.....5 Bucket......6 No facilities or bush or field.....7 (7⇒ B44) Other specify _____

B43	Is this facility located within your dwelling, or yard or compound?	Yes, in dwelling/yard/compound1 No, outside dwelling/yard/compound.....2
B44	What happens with the stools of young children (0-3 years) when they do not use the latrine or toilet facility?	Children always use toilet or latrine.....1 Thrown into toilet or latrine.....2 Thrown outside the yard.....3 Buried in the yard.....4 Not disposed of or left on ground5 No young children in household.....6 Other specify.....
B45	How do you ensure that drinking water is safe?	Do nothing1 Boil.....2 Add chlorine/Water Guard.....3 Other (specify).....
B46	Do you have a drying table for dishes?	Yes=1, No=2 <input type="checkbox"/>
B47	Do you have a pit for waste disposal?	Yes=1, No=2 <input type="checkbox"/>
B48	Do you usually wash hands with soap before during or after any of the following? Yes=1, No=2 1. Before handling food..... <input type="checkbox"/> 2. Before feeding a child..... <input type="checkbox"/> 3. Before breastfeeding a child..... <input type="checkbox"/> 4. Before eating..... <input type="checkbox"/> 5. After attending to a child who has defecated..... <input type="checkbox"/> 6. After changing child nappies..... <input type="checkbox"/> 7. After visiting a toilet..... <input type="checkbox"/>	
B49	Does the household have a hand washing facility close to latrine Yes=1, No=2	

MODULE C : HOUSEHOLD FOOD SECURITY AND DIETARY DIVERSITY

READ TO RESPONDENT:

“For each of the following questions, consider whether this has happened in the past 4 weeks. If the answer is yes to a question, please indicate how often this happened.”

Instructions for interviewer: Options for soliciting the frequency responses depend on the method defined from preliminary work for questionnaire adaptation. Examples:

- a) exact number or range of times it happened in the past [4 weeks]
- b) indication that it happened **rarely** (once or twice), **sometimes** (3-10 times), or **often** (more than 10 times) in the past [4 weeks].

NO.	QUESTION	Response Options. Assign code according to the following answers:	CODE
-----	----------	--	------

		(0) No = it did not happen in the past [4 weeks] (1) Rarely = once or twice in the past [4 weeks] (2) Sometimes = three to ten times in the past [4 weeks] (3) Often = more than 10 times in the past [4 weeks] <i>Or locally-defined terms of frequency corresponding to these ranges</i>	
C1.1	In the past [4 weeks], did you worry that your household would not have enough food?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.2	In the past [4 weeks], did it happen that you or any household member were not able to eat the kinds of foods you would have preferred to eat because of lack of resources?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.3	In the past [4 weeks], did it happen that you or any household member had to eat a limited variety of foods because of lack of resources?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.4	In the past [4 weeks] did it happen that you or any household member had to eat some foods that you really did not want to eat because of lack of resources?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.5	In the past [4 weeks] did it happen that you or any household member had to eat a smaller meal than you felt you needed because there was not enough food?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.6	In the past [4 weeks] did it happen that you or any household member had to eat fewer meals in a day because there was not enough food?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __
C1.7	In the past [4 weeks] did it happen that there was no food to eat of any kind in your house, because of lack of resources to get food?	0 = No <i>If yes: ask respondent "how often did this happen?"</i> 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) __

C1.8	In the past [4 weeks] did it happen that you or any household member went to sleep at night hungry because there was not enough food?	0 = No <i>If yes: ask respondent</i> “how often did this happen?” 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) <input type="text"/>
C1.9	“In the past [4 weeks] did it happen that you or any household member went a whole day and night without eating anything at all because there was not enough food?”	0 = No <i>If yes: ask respondent</i> “how often did this happen?” 1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times) <input type="text"/>

2.0 DIETARY DIVERSITY QUESTIONNAIRE

Please describe the foods (meals and snacks) that you ate yesterday during the day and night, whether at home or outside the home. Start with the first food eaten in the morning.

[Household level: consider foods eaten by any member of the household, and exclude foods purchased and eaten outside of the home]

Question number	Food group	Examples	Yes=1 No=0
C2.1	Cereals	bread, noodles, biscuits, cookies or any other foods made from millet, sorghum, maize, rice, wheat + <i>insert local foods e.g. nsima, porridge or pastes or other locally available grains</i>	
C2.2	Vitamin A rich vegetables and tubers	pumpkin, carrots, squash, or sweet potatoes that are orange inside + <i>other locally available vitamin-A rich vegetables(e.g. sweet pepper)</i>	
C2.3	White tubers and roots	white potatoes, white yams, cassava, or foods made from	
C2.4	Dark green leafy vegetables	dark green/leafy vegetables, including wild ones + <i>locally available vitamin-A rich leaves such as cassava leaves etc.</i>	
C2.5	Other vegetables	other vegetables (e.g. tomato, onion, eggplant) , including wild vegetables	
C2.6	Vitamin A rich fruits	ripe mangoes, cantaloupe, dried apricots, dried peaches + <i>other locally available vitamin A-rich fruits</i>	
C2.7	Other fruits	other fruits, including wild fruits	
C2.8	Organ meat (iron-rich)	liver, kidney, heart or other organ meats or blood-based foods	
C2.9	Flesh meats	beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds	
C2.10	Eggs		
C2.11	Fish	fresh or dried fish or shellfish	
C2.12	Legumes, nuts and seeds	beans, peas, lentils, nuts, seeds or foods made from these	
C2.13	Insects	insect larvae, lake fly, ants	
C2.14	Milk and milk products	milk, cheese, yogurt or other milk products	

C2.15	Oils and fats	oil, fats or butter added to food or used for cooking	
C2.16	Sweets	sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies	
C2.17	Spices, condiments, beverages	spices(black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages OR <i>local examples</i>	
E2.18	Household level only	Did you or anyone in your household eat anything (meal or snack) OUTSIDE of the home yesterday? Yes=1 No=0	
E 2 19		Did you receive coupons? Yes=1 No=0	

MODULE D : INFANT / CHILD FEEDING

Applicable to the youngest child of the HH child mother / caretaker

D1	Youngest Eligible Child Name	
D2	Youngest Eligible Child Date of birth (day/month/year)	/__/__/20__/ Verified in a health document.....1 Reported by mother/caretaker.....2	
D3	Youngest Eligible Child Age (completed months)	/__/__/	
D4	Youngest Eligible Child Sex	Male1 Female2	
D5	Mother / Caretaker Age (in completed years)	/__/__/	

Breastfeeding

D6	How long after birth “Child Name” was first put to the breast?	Within the first hour.....1 After the first hour.....2 Never.....3 Don’t know/don’t remember.....77	
D7	Has “Child Name” received the first milk (colostrums) ?	Yes1 No..... 2	

D8	Has “Child Name” ever been breastfed?	Yes1 No.....2	
D9	Since “Child name” was born, did you ever give him any of the following? Yes.....1; No.....2; Don’t know/don’t remember.....77	Vitamins, minerals supplements /___/ Plain water /___/ Sweetened/flavoured water /___/ Tea or infusion /___/ Fruit juice /___/ Infant formula /___/ Tinned, powdered or fresh milk /___/ Other liquids /___/ Porridge /___/ Mashed or solid food /___/	
D10	When did you start other food apart from breast milk?	/___/___ months	
D11	Is “Child Name” still breastfed?	Yes1 No.....2	
D12	Has “Child Name” ever been or is bottle-fed?	Yes1 No.....2	
Complementary feeding			
D13	Did “Child Name” receive food yesterday?	Yes1 No..... 2	2 ⇒ D16
D14	How many times “Child Name” receive food yesterday?	Once.....1 Twice.....2 Three times...3	Four times.....4 Five times.....5 More than Five times...6
D15	What kind of food did “Child Name” receive yesterday? Yes..... 1; No2	Staples/___ Vegetables...../ — Fruits...../— —	Legumes...../___ Food from animals../___ Sugar / Fats/___
D16	Did you prepare special meals for “Child Name” yesterday?	Yes1 No..... 2	2 ⇒D18

D17	Specify composition of special meal for “Child Name”? Yes.....1 No.....2	Staples / ___/Vegetables/___/ Fruits/___/Legumes/___/ Food from animal/___/Fat/sugar/___/	
D18	What prevented you to prepare “Child Name” special meals yesterday ?	Don’t know how to do.....1 Lack of time.....2 Miss food.....3 Other (specify) _____	

MODULE E : MORBIDITY AND HOUSEHOLD MORTALITY

Children Recent Morbidity and Caring

E1	In the past 2 weeks, did any children between 6-59 months have any of the following illnesses?	Fever with Chills 1-Yes ; 2-No Fever with difficult breathing..... 1-Yes ; 2-No Diarrhea..... 1-Yes ; 2-No	1 ⇒ E2
E2	During this diarrhea episode, what did you do?	Continue to breastfed / increase food intake..... 1 Cease breastfeeding / giving food..... 2 Give salt for diarrhea at home..... 3 Go to church / preacher 4 Go to traditional healer..... 5 Go to health center-post / hospital..... 6 Nothing..... 7 Other (specify) _____	
E3	Have you ever visited “Growth Monitoring Clinics” with any of your children between 6-59 months?	Yes 1 No.... 2	
E4	Do you still visit “Growth Monitoring Clinics” with any of your children between 6-59 months?	Yes 1 No.... 2	
E5	Is any adult of this household suffering from blood pressure?	Yes 1 No.... 2	
E6	Is any adult of this household suffering from diabetes?	Yes 1 No.... 2	

Household mortality

E8	Has anyone (excluding visitors) died in this HH during the last 12 months (August to now)?	Yes 1 No.... 2	2 ⇒ F1
----	--	-------------------------------	--------

E9	Number of deaths among under 5 Yrs	/__/__/ Sex M [] F []	
E10	Number of deaths between 5-14 Yrs	/__/__/ Sex M [] F []	
E11	Number of deaths between 15-64 Yrs	/__/__/ Sex M [] F []	
E12	Number of deaths above 65 Yrs	/__/__/ Sex M [] F []	
E13	Under 5 Yrs Causes of deaths <i>(1) Diarrhoea, (2) Bloody diarrhoea, (3) Measles, (4) Fever, (5) Cough with difficult breathing, (6) Malnutrition, (7) Accident, (8) Unknown, (9) Other (specify) (88)</i>	Death 1	Death 4
		Death 2	Death 5
		Death 3	Death 6
E14	Above 5 Yrs Causes of deaths <i>(1) Diarrhoea, (2) Long illness, (3) Age, (4) Fever, (5) Persistent cough, (6) Accident, (7) Unknown, (8) Other (specify) (88)</i>	Death 1	Death 4
		Death 2	Death 5
		Death 3	Death 6

MODULE F : 6-59 MONTHS CHILDREN ANTHROPOMETRY, VITAMIN A, FEEDING PROGRAMME

Child No	Sex 1=Male 2=Female	Date of Birth (dd/mm/yy)	Length /Height (cm)	Weight (Kg)	Oedema Yes=1 No=2	Deworming last 6 * months Yes=1 No=2	Measles *	Vit A *	** Child in feeding prog. last 6 mos If yes specify. No=0	**Child in feeding program now. If yes specify. No=0
1										
2										
3										
4										
5										

Key:

*Measles & Vitamin A: 1=Yes with health passport confirmation; 2=Yes without health confirmation; 3=No; 4=Not applicable.

**Feeding program: 1=NRU; 2=SFP; 3=CTC/OTP; 4= Other specify_____

Name of Field Investigator _____ Signature _____ Date ___/___/___

Name of Supervisor _____ Signature _____ Date ___/___/___

APPENDIX 2: CREATION OF THE WEALTH INDICATOR

VARIABLE	VALUES THAT GOT 1 POINT	Variable name
Level of education HoH	Secondary or higher	EDUC_HoH
Occupation of HoH	Tailor, business or employee	OCCUP_HoH
Amount of cultivated land	2 acres or more	land_cult
Offer ganyu	Yes	Ganyu
Cattle ownership	Quantity >0	cow_WEALTH
Goat ownership	Quantity >1	goats_WEALTH
Poultry ownership	Quantity >9	poult_WEALTH
Vegetable garden	Yes	Garden
Type of flooring	Cement or tiles	floor_WEALTH
Radio	Quantity >0	RADIO
Bicycle	Quantity >0	BICYCLE

This list reflects the frequency of the various items in module B of the questionnaire which were decided upon through consensus of the analysis team. A simple sum is made (range 0-11). The index is composed roughly of terciles of the score.