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Nutrition Baseline Survey Malawi

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Abbreviations

BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
DFID	Department for International Development
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning System Network
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IFAD	International Fund for Agriculture of the United Nations
IDDS-C	Individual Dietary Diversity Score for Children
IDDS-W	Individual Dietary Diversity Score for Women
IYCF	Infant And Young Child Feeding
MAD	Minimum Acceptable Diet
Md	Median
MDHS	Malawi Demographic and Health Survey
MMD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
NGO	Non-Governmental Organization
PLW	Pregnant and Lactating Women
SD	Standard Deviation
SEWOH	Special Initiative “ONE WORLD – No Hunger” (Sonderinitiative “Eine Welt ohne Hunger”)
SPSS	Statistical Package For Social Sciences
SUN	Scaling Up Nutrition
TA	Traditional Authorities
UNDP	Human Development Report
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization of the United Nations

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Introduction

Over 800 million people worldwide suffer from hunger and two billion do not meet their micro nutrient requirements (Global Nutrition Report, 2016). While the global starving population has gone down in recent decades, the number of people suffering from hunger in sub-Saharan Africa today is higher than ever. Malnutrition is particularly prevalent in developing countries, where it has an impact not only upon the development prospects of an entire country, but also of each individual affected. If a child does not receive sufficient nutrients up to its second year, i.e. over its first 1,000 days beginning with the early embryonic phase, the impact on growth, mental faculties and therefore learning and working potential will endure a lifetime.

The German Ministry of Economic Co-operation and Development (BMZ) launched an Initiative “On World – No Hunger” to improve food and nutrition security (<https://www.bmz.de/webapps/hunger/index.html#/de>). Within this initiative GIZ implements the program “Food and nutrition security, enhanced resilience” in 11 countries in Africa and Asia.

The project’s main target group includes women of childbearing age, pregnant women, breastfeeding mothers and infants. The project’s objective is to improve the nutritional situation of approximately 880000 women, 235000 young children and 4.000 households. Structural measures to combat hunger and malnutrition, particularly among mothers and young children, are one of the most effective ways of investing in the future of a society.

In order to measure our impact we used standard indicators in line with internationally recognized methods in order to measure whether children (up to 23 months) receive a minimal acceptable diet and women eat more diversified. We conducted so far baselines in Benin, Burkina Faso, Cambodia, Ethiopia, India, Kenya, Mali, Malawi, Togo and Zambia in order to get an overview of the overall food and nutrition situation in the program areas of the respective countries. The baseline studies provided valuable data for intervention planning as well as our monitoring and evaluation system. All baseline studies were conducted in a standardized form and in line with a guideline especially developed for this purpose.

We want to thank all consultants and enumerators, all our partner organizations, FAO, University of Giessen, Bioversity International and last but not least more than 4.000 women who offered their time to answer our questions.

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Michael Lossner

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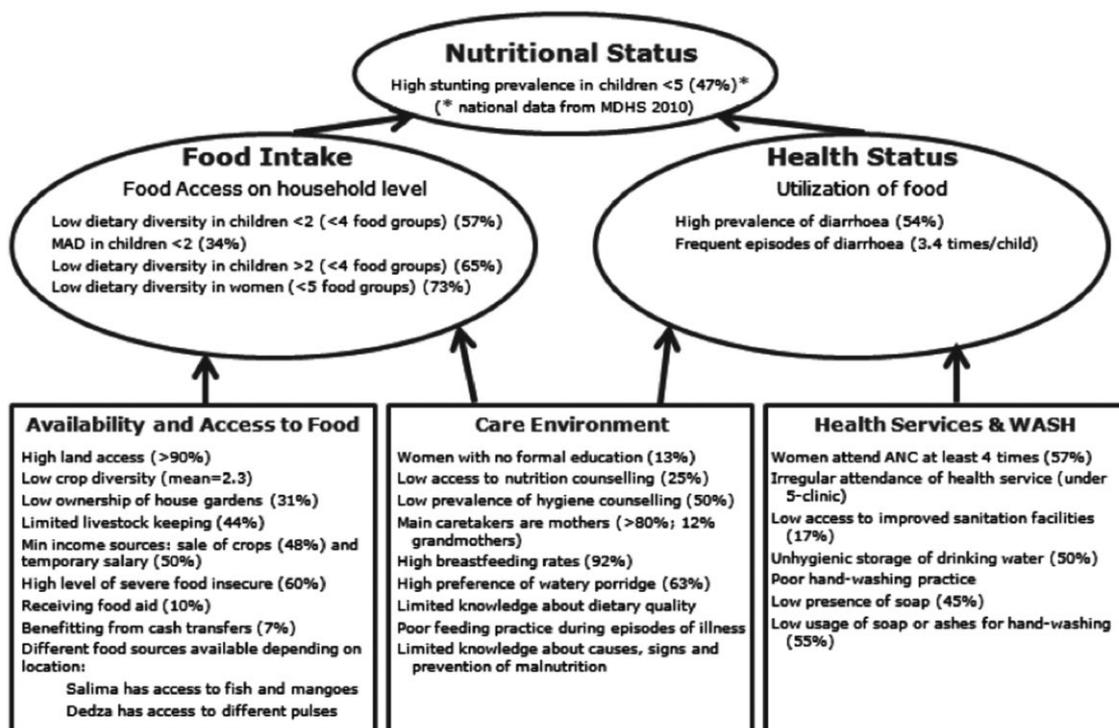
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1. EXECUTIVE SUMMARY

The current SEWOH Nutrition Baseline Survey was conducted among women of reproductive age, infants and young children between the age of 6-23 months, as well as pre- and primary school children in Malawi in August and September 2015. The main objective of this survey was to describe the nutrition situation among the target groups in selected rural areas of the districts Dedza and Salima. Of special interest were Minimum Acceptable Diet (MAD) of infants and young children and Individual Dietary Diversity Score Women (IDDS-W). Further, it aimed to examine linkages between dietary diversity and complementary feeding practices with living conditions as well as with knowledge and practice in regard to nutrition and hygiene.

Figure 1: Results of the NBS presented according to the UNICEF Model





2. BACKGROUND AND OBJECTIVES

2.1. Country Context

The Republic of Malawi is a landlocked, densely populated country in South-eastern Africa with a very young and predominantly rural population (DFID 2010). According to the 2014 Human Development Report (UNDP), Malawi is a least developed country ranked at 174 out of 187 countries. It shares borders with the United Republic of Tanzania to the North, Mozambique to the South-east, South and South-west, and Zambia to the West. Its total area amounts to approximately 118,480 km² of which Lake Malawi accounts for around one third. With a population density of 120 inhabitants per km², Malawi is one of the most densely populated countries in Sub-Saharan Africa. Malawi's economy is largely based on agriculture, with about 80% of the population engaged in this sector, mainly in small-scale subsistence farming (IFAD 2011). Agricultural production is dominated by maize. About 97% of farmers grow maize and more than half of households grow no other crop than maize. More than 60% of the national calorie consumption is obtained from maize which makes it the dominant staple food in the diet (DFID 2010). Maize is consumed as a stiff, unfermented porridge called *nsima*. A typical Malawian meal is composed of starch in generous amounts accompanied by a relish of beans, meat or vegetables in a tomato-and-onion sauce (Mtiumuni 2008).

Since almost all agriculture is rain fed, households depend on yearly rainfalls for their livelihoods. Most households run out of own food stores around December. The season of food shortage goes up to March, the time of the annual maize harvest for most households (Mtiumuni 2008). The 2015 Food Security outlook (January – March and April - June) reported a poor harvest in 2014/2015 due to a late start of the harvest season as well as dryness. Agricultural labour opportunities were below average. In June 2015, humanitarian assistance was provided for households already facing acute food insecurity (FEWS NET 2015).

Despite food insecurity due to limited access to and availability of foods, Malawian children and women often suffer from malnutrition as a result of an unbalanced diet and lack of dietary diversity. Inadequate knowledge of healthy food choices and appropriate combinations of food items from the Malawi Six Food Groups (Ministry of Health 2007), as well as of childcare and optimal feeding practices, hinders

households to benefit from available nutrient-rich foods. Families often lack appropriate skills and access to technologies for food preparation, preservation and storage, resulting in decreased quantity and quality of available food, and thus, malnutrition. The latest Malawi Demographic and Health Survey (MDHS) 2010 showed that malnutrition was prevalent among women aged 15 to 49 years with 8.8% being thin (1.9% severe or moderate, 6.8% mildly), and 17.1% being overweight or obese (13.1% overweight, 4.0% obese). Furthermore, about 47% of children less than five years of age were chronically malnourished (stunted). According to the World Health Organization (WHO), stunting rates > 40% classify a severe public health and nutrition problem (WHO 1997).

The central region of Malawi had the highest prevalence rates of anaemia (11%) among children 6-59 months while rates in the northern and southern regions were lower (8% and 7%, respectively). However, rates decreased from 16.8% in children aged 6-8 months to 2.9% in children aged 48-49 months. Major causes of malnutrition and anaemia include inadequate complementary feeding and care practices, such as low dietary diversity and poor quality foods, also among young children who receive family foods. Additionally, diseases, poor water, inappropriate sanitation and hygiene practices, and other household and family factors contribute to the malnutrition problem (National Statistical Office 2010). Any shock in food availability and illnesses can trigger an increase in the already existing problem of malnutrition. Particularly in 2015, since the food production is estimated to be 30.2% less due to flooding and drought, malnutrition will be a major challenge for the country.

2.2. Specific Project Information

The *special initiative ONE WORLD - No Hunger* (SEWOH) addresses hunger and malnutrition, an issue that is of uppermost significance in the Post-2015 Development Agenda in the context of Germany's G7 presidency (<https://www.giz.de/en/mediacenter/30854.html>). SEWOH will be implemented through bilateral and multilateral development cooperation and through partnerships with enterprises, business associations, civil society, and academia. Further, this initiative includes a development of international goals, standards, and guidelines for global food security and nutrition under participation of the Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (BMZ). Nutrition baseline surveys will be conducted in Malawi, Ethiopia, Benin, Burkina Faso, Cambodia, India, Kenya, Mali, Togo, Yemen, and Zambia by using the same survey tools.

The focus of the Malawi country package is on three areas of intervention:

- Basic education and health facilities in the districts of Dedza and Salima are supported in encouraging and promoting dietary improvements for mothers and children under the age of five
- The District Nutrition Committees are strengthened in their multi-sector coordination role and put in a position to implement the government's School Health Nutrition strategy at 30 primary schools and early development centres
- The lessons learned for the bilateral portfolio and the national Scaling Up Nutrition (SUN) process are analysed.

Figure 2 Overview of countries for the nutrition baseline surveys



Care International, Concern Universal, Village Reach, and Welthungerhilfe are addressing the three areas of intervention (Annex C, page 40). Efforts aim at the structural reduction of hunger and malnutrition, especially in mothers and young children. The project period is three years and two months (from October 2014 to December 2017) with a possible extension until 2019.

2.3. Objectives of the Nutrition Baseline Survey

The causes of malnutrition

In 1990, UNICEF developed a comprehensive model that describes the inter-linkages between the multi-dimensional causes of malnutrition that occur at various levels within societies. The model is still being widely used as well as amended in latest publications (i.e. LANCET 4/2013). It explains malnutrition both in rural and urban settings. All forms of malnutrition share a common cause: inappropriate diets that provide inadequate or excessive macronutrients and/or micronutrients. Yet, many other factors also play a role in malnutrition at different levels – as identified by the model:

- The **immediate causes** include inadequate dietary intake and disease, which directly impact on an individual's nutritional status;
- These primary causes are influenced by **underlying causes** such as food access and availability at household level, healthcare, water and sanitation, and care, particularly young children, but also women (breastfeeding practices, hygiene practices, women's workload etc.) at the household or community level. Education levels – both formal and informal incl. life skills – play a determining major role;
- The **basic causes** of malnutrition are wide-ranging, from structural and natural resources, to social, economic and legal environments, and political and cultural contexts across regional, national and international levels.

To identify the underlying causes of malnutrition in a target population, information is needed to design interventions that address the current situation of the potential beneficiaries. Therefore, the **objective** of this Nutrition Baseline Survey (NBS) is to provide reliable information on the food and nutrition situation of women of reproductive age, infants and young children in the project area. The target groups of women aged 15–49 years, infants and young children (0-23 months) were chosen, because they are particularly vulnerable to suffer from undernourishment and malnutrition. Especially households in fragile contexts, such as rural subsistence farming households, are often not in a position to independently strengthen their resilience to hunger crises. Furthermore, it is vital to focus on the '1,000 day window' (from conception to the age of two years). In this window of opportunity, inadequate nutrition and diseases can lead to irreversible damage in regard to the development of mental and/or motor skills as well as immune system. Thus, a focus on these target groups is vital to guarantee a proper development of the individual and overall potential of the upcoming generations.

The main indicators of the NBS are:

- **Household Food Insecurity Experience Scale** (HFIES) for interviewed households
- **Individual Dietary Diversity Score Women** (IDDS-W) for mothers 15-49 years of age
- **Minimum Acceptable Diet** (MAD) for infants 6-23 months of age
- **Individual Dietary Diversity Score** (IDDS) of pre-school children (2-5 years of age) and primary-school children (6 years of age and older)



3. METHODS

3.1. Project Area, Participants and Sample Size

Dedza

Dedza district is located south east of Lilongwe and has eight Traditional Authorities (TAs). The total population of Dedza is 702,497, with 35,124 children under one year of age and 119,424 children under five years of age (Ministry of Health 2014). The average landholding size with around 1 acre is rather small. Although a matrilineal system is widespread, where husbands leave their homes to live with the wife's family, and cultivation rights are inherited by the wife, women often face difficulties in accessing land. Project activities in Dedza will be carried out in the TA Chauma. Chauma is the smallest TA of the district with a population of around 23,000.

Though, generally, Dedza has a high variety of produced foods (different staples and vegetables), about 90% of agricultural produce is sold. Fishery (along the lake shore) and charcoal burning are also common income sources. Most households run out of own produced food by August, even though the harvest season is from June to July. During the lean season, women rely on public work. However, households often face food insecurity throughout the year.

In Dedza, the stunting (chronic malnutrition) rate of children under five years of age is very high with 46.4%. Around 4% of the children in this age group are wasted (acute malnutrition) (MDG Endline survey 2014).

Salima

Salima district is located east of Lilongwe along the shore of Lake Malawi and has ten TAs. Salima has a total population of 337,895 people according to the 2008 National Population Census with a 2015-projected population of 407,148 people (CARE Malawi GIZ Proposal "Improving Food Security and Building Resilience"). The area along the lake shore has a higher population density compared to the rest of the district. Three TAs, namely Maganga, Ndindi, and Pemba were selected for project activities. All three TAs are along the lake. Maganga has the highest population (\approx 59,000) followed by Ndindi (\approx 48,000) and Pemba (\approx 25,000).

Salima is one of the drought prone districts, located in a rain shadow area, meaning that rains are not fully received. Mostly, rains already stop in February, leaving crops immature. At the lake shore, people rely on fishing since agriculture is almost impossible. Currently, there are around 107,000 farming households in Salima, of which 2% ran out of food in the first half of December 2014 compared to 10% in 2013. Sanitation depends on the season and becomes a problem during the rainy season. Latrines are collapsing and can threaten the safety of drinking water. In Salima, stunting rates among children under five years of age increased from 40% to 47% over the past years indicating a severe public health problem. Wasting rates are at 5.7% (MDG Endline survey 2014).

Participants and Sample Size

The current NBS included participant pairs of the following three target groups:

- Women of reproductive age (15-49 years)
- Infants and young children between 6-23 months
- Pre-school and primary school children older than 2 years of age

The calculation of the sample size, i.e. households with eligible participants, was based on the program target impact of a 0.5 food group increase in women¹. The calculation of the necessary sample size was done with GPower. A sample size of 400, including some additions for drop-outs, will be used for the NBS. The sample size will not change, no matter what mean food group score will be identified in the baseline (Table 1). Since the Malawi NBS also included pre- and primary school children, a total of 436 households were included in order to meet sample size requirements for this target group.

Table 1: Sample Size calculation for SEWOH NBS

Mean Baseline	Mean Endline	α error	Power 1- β error	SD	N Baseline	N Endline	Total
Increase by 0.5 food groups							
4	4.5	0.05	0.95	2	347	347	694
3	3.5	0.05	0.95	2	347	347	694

3.2. Sampling procedure

The sampling procedure based on a two stage probability cluster sampling. The previously selected TAs were the primary sampling unit. Population information of selected TAs including all villages was provided by the GIZ team leader. The calculated 400 households to be selected were proportionally distributed among the TAs based on the provided population information. The 16 estimated survey days (based on conducting 32 questionnaires per day (4 per team, 8 teams in total), were proportionally allocated among TAs according to the targeted number of households (Table 2). **At the first sampling stage**, villages served as clusters and were randomly selected according to probability sampling proportional to size. The randomization process of selecting clusters followed the “Guidelines for nutrition baseline surveys in communities” (Gross et al 1997). The proportion of infants and children between 6-23 months of age was estimated in order to calculate the least number of infants and children 6-23 months to be expected in the clusters. According to the latest census data from Malawi, about 22% of the population is under five years

¹ An increase of 0.5 food groups is equal to a 5% increase since dietary diversity of women is measured based on 10 food groups.

of age. Assuming uniformity, each year of age makes up 4.4%, and thus, the target group 6.6%. For each TA, the village with the least number of inhabitants was identified. Then, the expected number of infants and young children was calculated (6.6% of the respective population).

Table 2: Population information and estimations for NBS

TA	Total population in TA	Population	Number of HH to be selected	Planned Survey days	Expected least number of children 6-23 months per village	Number of selected clusters	Actual survey days
Chauma	23,322	15%	60	2.5	6	10	4
Maganga	58,701	38%	152	6	6	25	4
Ndindi	47,614	31%	124	5	6	21	5
Pemba	25,361	16%	64	2.5	6	11	2.5
Total	154,998	100%	400	16	Ø 6	67	15.5

(TA=Traditional Authority, HH=households)

Originally, the number of clusters to be surveyed for each TA was calculated by dividing the number of households to be selected per TA by the number of children 6-23 months of age to be expected per cluster. This resulted in a total of 135 clusters. However, due to consideration of logistics and survey days, the number of clusters per TA had to be limited. With the existing survey team, it was possible to reach four clusters per survey day. The least number of children 6-23 months of age to be expected per cluster was increased to six, taking into account that at least 80% of all clusters had at least six children in the respective age group. In case there were not enough children found in a cluster, additional children were sampled from the neighboring village. In total, 67 clusters were sampled for the survey (see Annex A, page 37). After calculating the number of clusters to be selected in each TA, clusters were randomly selected proportional to population size. The total number of inhabitants in each TA was divided by the selected number of clusters which then served as the mean number of inhabitants. Afterwards, a number below this mean was generated using a random number generator. With this random number, a series of numbers (equivalent to the number of clusters to be selected) was constructed for each TA by addition of the mean number of inhabitants to this randomly selected number and subsequently to each sum (Table 3).

Table 3: Excerpt of series of generated numbers

TA	Chauma	Maganga	Ndindi	Pemba
Total population	23322	58701	47614	25361
Number of clusters	10	25	21	11
Mean	2332	2348	2267	2306
Random number	650	976	118	605
1	650	976	118	605
2	2982	3324	2385	2911
3	5314	5672	4652	5217
4	...	...	...	...

(Completed list in Annex B, page 39)

Using cumulative population information for each TA, this series of numbers was used to select the clusters. All clusters which had the lowest difference between the cumulative number of inhabitants and the numbers in the series were selected.

At the second sampling stage, six households were randomly selected per cluster. Main selection criteria for households were at least one woman of reproductive age (15-49 years) and at least one child in the age group 6-23 months of age.

To identify the households, every morning a number (1-6) was diced to randomly select the households. Starting from the centre of the village the enumerator teams counted households until the diced number was reached. Each enumerator team went into a different direction. If the identified household did not have a woman of reproductive age as well as a child 6-23 months of age, the enumerator team went to the next household. After finalising an interview, the enumerator team started counting the households starting with one until the diced number was reached. In two villages (with the lowest population), four households were selected. In another two villages (with the highest population), seven households were selected. If the targeted number of mothers and children were not found in the sampled village, the next closest village was chosen to include the missing mother-child pair. In case there was more than one child in the respective age group of 6-23 months, **always the youngest child was enrolled**. The same approach was used for twins as well as pre-school and primary-school children.

Prior to data collection in the villages, each village chief was informed about the survey. After arriving in the village, the team introduced itself to the village chief, explained the random selection of households, and asked for permission to collect data.

3.3. Data collection

The data collection took place between 24th August and 19th September 2015. Prior to data collection, 20 enumerators were trained for 5 ½ days (Annex D: page 41). Eighteen enumerators were selected for the conduct of the survey; the remaining two enumerators joined the team to make up for possible staff shortage due to illness or high workload. Among the 18 enumerators (10 females, 8 males), two were assigned as supervisors (one female and one male). During the data collection, enumerators worked in pairs: Enumerator 1 interviewed the respondents and recorded the paper based 24h-recalls, while enumerator 2 recorded answers with the tablet. Every three days, pairs were mixed. However, their position either as enumerator 1 or 2 remained the same. Each pair had at least one female enumerator. The overall survey team was divided into two groups (four pairs each) and guided by one supervisor each. Every survey day, two to three villages were scheduled per group (four to six in total) and each enumerator pair conducted three to five interviews per day. Data were collected with a standardized questionnaire. Information of collected data as well as the applied assessment instruments are presented in Table 4 (page 9), the questionnaire is presented in Annex R (page 49).

All interviews were conducted in the local language Chichewa. The location of the interview was around the homestead of the selected respondent. During the interview, privacy was assured by keeping an adequate distance between the interviewee and other household members. After the interview, enumerators 1 and 2 compared the paper-based and tablet version of the 24h dietary recalls to minimize recording biases. Furthermore, general household and participant observations were discussed and the GPS coordinates of the household recorded.

Interviews were conducted according to the *Nutrition Baseline Survey Interview Guide* (Annex E, page 44) to ensure standardization of interviews. In case the respondent was not the caretaker of the child of the day before the interview, the actual caretaker of that day was interviewed for the child's 24h-recall. Quality control of data collection was done every day by the assigned supervisors using the *Quality Control Protocol for Interviewer* (Annex F, page 45).

Table 4: Overview of collected information and assessment instruments

	Collected data	Assessment instrument
1	Socio-demographic information	Structured questions
2	Agriculture	Structured questions
3	Sanitation and hygiene situation	Structured questions
4	Food security status	Household food insecurity experience scale
5	Childcare and feeding practices	Structure questions
6	Dietary intakes of children 6-23 months	24h dietary recall (qualitative)
7	Nutritional knowledge of women	KAP questions
8	Hygiene behaviour	KAP questions
9	Dietary intake of women	24h dietary recall (qualitative)
10	Dietary intake of pre- and primary school children	24h dietary recall (qualitative)
11	Appearance of household	Observation

3.4. Indicators

Household Food Insecurity Experience Scale (HFIES)

The pattern of responses to ten HFIES questions was used to classify the food insecurity severity of households. The number of affirmative responses to the HFIES questions is called the raw score, which was used to produce food insecurity prevalence estimates within the total survey population. The HFIES is composed of eight questions with dichotomous yes/no responses and two extended follow-up questions. Each question contributes one point to the raw score if the response is “yes” and each follow-up question contributes one point if the response is “almost every week”. Therefore, the raw score has a minimum of 0 and a maximum of 10. Households with a raw score of 0 are classified as food secure. A raw score of 1-3 indicates mild food insecurity. Moderate food insecure households have a raw score of 4-6, and severe food insecure households have a raw score of 7-10. This simple method of food insecurity classification does not allow for the comparison of estimates among different countries or sub-populations within a country. Intra-country comparisons require further analysis by adjusting each country’s scale to a global standard (Cafier, Nord, Viviani et al, 2015).

Dietary diversity

Dietary diversity was assessed and categorized with the indicators “Individual Dietary Diversity Score” (IDDS) and “Minimum Dietary Diversity” (MDD). Both indicators are used as a proxy measure of the nutritional quality of an individual’s diet. In the current survey, dietary diversity information of women and children 6-23 months was collected by conducting **free 24h-recalls**, whereby respondents are asked about the different types of food they (or their children respectively) had eaten during the day prior to the interview. The different consumed food items are assigned to predefined food groups and used to calculate IDDS and MDD. Since free 24h-recalls require a high level of attention and can be tiring for respondents, dietary information for children >2 years were collected by directly asking if foods from the food groups were consumed the previous day.

Minimum Dietary Diversity - Women

Individual Dietary Diversity Score - Women (IDDS-W) was assessed based on a total of 10 food groups (FAO/FANTA 2014) (Table 5). To calculate the prevalence of Minimum Dietary Diversity–Women (MDD-W), FAO recommends a cut-off point of 5 food groups. A high prevalence of MDD-W is a proxy for better micronutrient adequacy among women aged 15–49 years in the respective population (FAO/FANTA 2014).

Table 5: Food groups for 10 food group score with respective Malawian food items

Starchy staple foods	Foods made from Maize (nsima, porridge), cassava, grains like sorghum, millet, rice, wheat, oats, white (sweet) potatoes, white yams, green unripe banana
Beans and peas	Any foods made from mature beans or peas (fresh or dried), bambara nuts, lentils, soya, cowpeas, velvet beans
Nuts and seeds	Any foods made from groundnuts, sweet-mlalala, peanut-butter, tree-nuts, pumpkin seeds, sunflower seeds, cashew nuts or seeds including nut/seed butters
Dairy products	Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)
Flesh foods	Any kind of meat, organ meat, sea food, insects, insect eggs, land and sea snails
Eggs	Eggs from any kind of birds
Dark green leafy vegetables	Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranth, bean leaves, pumpkin leaves, rape, mustard?
Vitamin A-rich fruit/vegetables	Ripe mangoes, ripe Paw paws, ripe passion fruit, pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside
Other vegetables	Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green beans
Other fruits	Any other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh, green/unripe mangoes

Minimum Acceptable Diet (MAD) of children 6-23 months of age

The WHO indicator Minimum Acceptable Diet and its required indicators Minimum Dietary Diversity (MDD) and Minimum Meal Frequency (MMF) were assessed and analysed according to the description in the WHO Indicators for assessing infant and young child feeding practices part 2: measurement (WHO 2010).

Minimum dietary diversity is defined as receiving foods from ≥ 4 of 7 food groups: 1) Grains, roots and tubers, 2) legumes and nuts, 3) dairy products (milk, yogurt, cheese), 4) flesh foods (meat, fish, poultry and liver/organ meats), 5) eggs, 6) vitamin-A rich fruits and vegetables, and 7) other fruits and vegetables (Table 6).

Definition: Proportion of children 6–23 months of age who receive foods from 4 or more food groups.

$$\frac{\text{children 6–23 months of age who received foods from } \geq 4 \text{ food groups during the previous day}}{\text{children 6–23 months of age}}$$

Table 6: Food groups for 7 food group score with respective Malawian food items

Grains, roots and tubers	Foods made from Maize (nsima, porridge), cassava, grains like sorghum, millet, rice, wheat, oats, white (sweet) potatoes, white yams, green unripe banana
Legumes and nuts	Any foods made from mature beans or peas (fresh or dried), bambara nuts, lentils, soya, cowpeas, velvet beans, groundnuts, sweet-mbalala, peanut-butter, tree-nuts, pumpkin seeds, sunflower seeds, cashew nuts or seeds including nut/seed butters
Dairy products	Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)
Flesh foods	Any kind of meat, organ meat, sea food, insects, insect eggs, land and sea snails
Eggs	Eggs from any kind of birds
Vitamin-A rich fruit/vegetables	Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranth, bean leaves, pumpkin leaves, rape, mustard, ripe mangoes, ripe paw paws, ripe passion fruit, pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside
Other fruits/vegetables	Any other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh, green/ unripe mangoes Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green beans

Minimum meal frequency among currently breastfeeding children is defined as children who also received solid, semi-solid, or soft foods 2 times or more daily for children aged 6-8 months and 3 times or more daily for children aged 9-23 months. For non-breastfeeding children aged 6-23 months it is defined as receiving solid, semi-solid or soft foods, or milk feeds, at least 4 times.

Definition: Proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semi-solid, or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more.

$$\frac{\text{Breastfed children 6–23 months of age who received solid, semi-solid or soft foods the minimum number of times or more during the previous day}}{\text{Breastfed children 6–23 months of age}}$$

and

$$\frac{\text{non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or milk feeds the minimum number of times or more during the previous day}}{\text{non-breastfed children 6–23 months of age}}$$

The minimum acceptable diet for breastfed children aged 6-23 months is defined as receiving the minimum dietary diversity and the minimum meal frequency, while for non-breastfed children it further requires at least 2 milk feedings and that the minimum dietary diversity is achieved without counting milk feeds.

Definition: Proportion of children 6–23 months of age who receive a minimum acceptable diet (apart from breast milk).

*Breastfed children 6–23 months of age who had at least the minimum dietary diversity
and the minimum meal frequency during the previous day*
Breastfed children 6–23 months of age

and

*non-breastfed children 6–23 months of age who received at least 2 milk
feedings and had at least the minimum dietary diversity not including milk feeds
and the minimum meal frequency during the previous day*
non-breastfed children 6–23 months of age

Individual Dietary Diversity Score – Children > 2 years

Since there is no recommended indicator for the age group of children > 2 years, dietary information for pre- and primary-school children was calculated based on the 7 food group score (Table 6). This allowed calculating the prevalence of MDD (≥ 4 food groups) in this age group as well.

Measuring Knowledge, Attitudes and Practises

Nutrition-related knowledge, attitudes and practices (KAP) questions are a useful method for gaining an insight into peoples' personal determinants of their dietary habits and closely related hygiene and health issues. They can thus provide valuable inputs for effective programme and project planning. Nutrition-related KAP studies assess and explore peoples' KAP relating to nutrition, diet, foods and closely related hygiene and health issues. KAP studies have been used for two main purposes: 1) to collect key information during a situation analysis, which can then feed into the design of nutrition interventions and 2) to evaluate nutrition education interventions (FAO 2014). Several KAP questions were included in the questionnaire.

3.5. Data Analysis

Data were entered onto tablets during the process of the interview. Every evening, collected data were transferred to IBM SPSS Statistics Version 23 (IBM Corp 2015) (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). After completion of data collection, data were cleaned and analysed with IBM SPSS Statistics Version 23. Data were analysed applying descriptive analysis, including mean, median (Md), standard deviation (SD), minimum (Min) and maximum (Max) and frequencies.



4. RESULTS

A total of 436 households were included in the data collection, 96 in Dedza district and 340 in Salima district. In Dedza, all interviews were conducted in Chauma. In Salima, 151 interviews were conducted in Maganga, 124 in Ndindi, and 64 in Pemba. The results disaggregated by TAs are presented in Annex S, (page 60). Respondents were mothers or primary female caretakers in reproductive age (15-49 years of age) with a child in the age range 6-23 months. In the selected households, dietary data of 262 pre-school children in the age group 2-5 years (63 in Dedza and 199 in Salima) and 268 primary school children six years and above (57 in Dedza and 211 in Salima) were collected. Figure 3 shows the location of the selected households.

Figure 3: Map of survey area (Chauma, Ndindi, Maganga and Pemba)²



Map prepared by Dr. Boran Altincicek

² Prepared with google maps: https://www.google.com/maps/d/edit?mid=z6_PvGRNP3do.k4wNbemVxblK

4.1. Socio demographic information

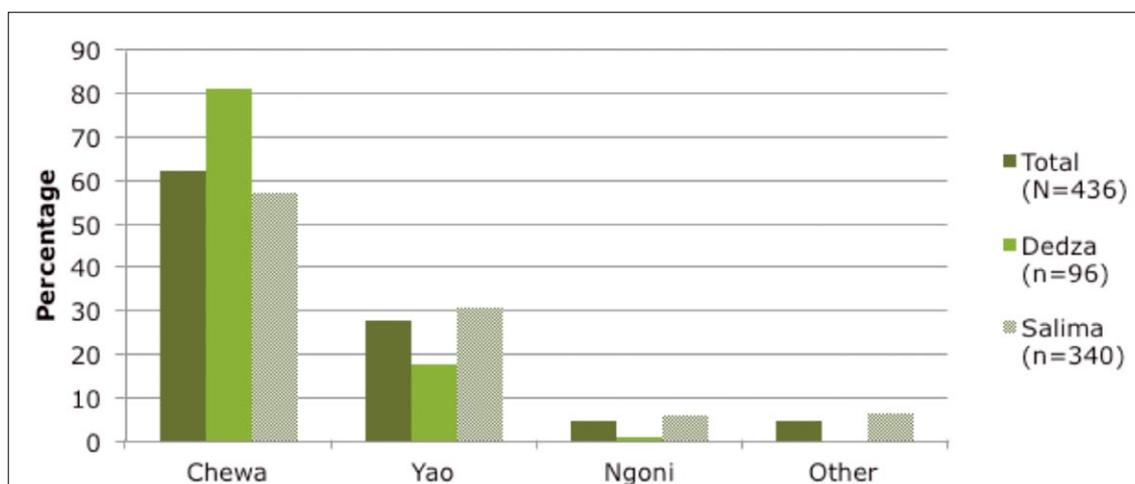
Most respondents were married monogamous (65.4%), followed by married polygamous (15.8%), divorced or separated (9.4%), single (8.5%), and widowed (0.9%) (Table 7). There were no differences between the two districts. Most households were male-headed (80.5 %) and only 19.5% were female-headed with no differences between Dedza and Salima.

Table 7: Marital Status of respondents overall and by district

Marital Status	Total (N=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Married monogamous	65.4	65.6	65.3
Married polygamous	15.8	17.7	15.3
Widowed	0.9	0.0	1.2
Divorced or separated	9.4	9.4	9.4
Single	8.5	7.3	8.8

The most common ethnic group in the survey area were Chewa (62.4%). In Dedza, the percentage of Chewa people (81.3%) was higher compared to Salima (57.1%), while Salima had a higher percentage of Yao people. Among the Chewa ethnicity, the majority of people are Christians whereas among the Yao, Muslim faith is common. As the number of Muslims living in Salima is higher than in Dedza, the differences in Chewa and Yao ethnicity were expected.

Figure 4: Respondents' ethnicity



The primary reason for settling in the area was being born in the area. In Salima, about five times more respondents settled in the area due to wanting better livelihoods compared to Dedza (Table 8). According to observations, Dedza seemed less developed compared with Salima. Chauma in Dedza is generally difficult to reach due to bad road conditions even during the dry season, which hinders trade with other communities or areas. Magana, Ndindi and Pemba in Salima are located around the lakeside, reachable on tarmac roads. Tourists from the capital Lilongwe or abroad spend their weekends or holidays near the lake in Salima.

Table 8: Reasons for settling in the area

Reason for settling in that area	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Born in the area	67.7	71.9	66.5
Moved here by marriage	21.1	22.9	20.6
Wanted better livelihood (fertile land/ business opportunity)	9.6	2.1	11.8
Got land assigned in the area	1.6	3.1	1.2

The average household size was 5.4 (± 2.0) (Md=5, (N=421)) with a minimum of 2 and a maximum of 15 members living permanently (reference time 1 year) in the respondent's household. Annex G (page 47) shows the distribution of household sizes. The mean number of household members in Dedza was 5.0 (± 1.5) (Md=5, min=2, max=9 (N=92)). In Salima, on average 5.5 (± 2.1) (Md=5, min=2, max=15 (N=329)) people lived permanently in a household. In Malawi it is common that children, parents, and grandparents live in one household.

Most respondents (87%) had some form of formal education. Among those respondents who went to school, the mean year of schooling was 5.4 (± 2.8) (N=378, Md=5; Min=1, Max=15). However, only 19% completed primary education of eight classes of schooling (Table 9). Educational status did not differ between districts.

Table 9: Educational level of respondents

Level of Education	Total (N=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
No education	13.1	12.5	13.2
Some primary	68.2	64.6	67.4
Completed primary	5.2	8.0	0.0
Some secondary	7.4	5.2	6.9
Completed secondary	3.2	6.3	3.9
College or higher	0.3	1.0	0.2

Respondents were asked for income sources of their household throughout the year. The main income sources were temporary salary (49.8%), petty trade/small business (48.2%), and sale of crops (48.2%) (Table 10). However, source of income differed between Dedza and Salima in regard to sale of crops and petty trade/small business, and regular salary. In the selected TAs of Salima, production of crops is difficult due to soils low in nutrients and a high population density. However, the higher percentage of a regular income and petty trade may be related to the better infrastructure and nearby touristic places. Due to the proximity to Lake Malawi, sale of animal products was expected to be higher in Salima. However, respondents might not have considered fish as an animal product. The number of different income sources per household was similar in Dedza and Salima with mean of 1.7 (± 0.7) (Md=2, min=0, max=4). Only one respondent, a divorced/separated mother from Salima, did not have any income source.

Table 10: Sources of income

Source of income	Total (n=430) (%)	Dedza (n=90) (%)	Salima (n=340) (%)
Sale of crops	48.2	71.9	41.5
Sale of animal products	3.0	6.3	2.1
Sale of goods/crafts	14.7	8.3	16.5
Temporary salary	49.8	58.3	47.4
Petty trade/small business	48.2	30.2	53.2
Regular salary	6.2	0.0	7.9
Remittance from relatives/husband	4.6	0.0	5.9
none (subsistence farming only)	0.2	0.0	0.3

4.2. Agriculture

Respondents were asked, if their household had access to any land (in addition to a home garden) that could be used for agriculture. In total, 92% of the households had access to arable land. While in Dedza, all households had access. In Salima³, 90% of households had access to agricultural land. Overall, the crop diversity was low. Most households grew two or three different crops (mean= 2.5 ±1.1, Md=2, min=0, max=7). The mean number of different crops grown in Dedza was higher than in Salima (Dedza: Mean= 2.9 ±1.1, Md=3, Min=1, Max=7; Salima: Mean 2.4 ±1.1, Md=2, Min=0, Max=7). Among those who possessed agricultural land, 99.3% grew maize, followed by groundnuts (44.6.1%), rice (19.4%), soya (20.48%), beans (14.9%), and cowpeas (14.2%). Table 11 demonstrates that crop production varied between Dedza and Salima in regard to cassava, rice, groundnuts, soya, beans, cowpeas, and cotton. In Dedza, main crops following maize were soya (71.9%), groundnuts (64.6%), and beans (44.8%), all crops high in protein. However, contamination with aflatoxin, especially in groundnuts, might become a serious health hazard during and after storage. In Salima, main crops following maize were groundnuts (38.3%), rice (24.9%), cowpeas (18.7%), cotton (14.1%), and cassava (12.1%). Cotton and tobacco are grown as cash crops.

3 As aforementioned, Salima has a higher population density which limits the available land and many people live from fishing in Lake Malawi.

Table 11: Crop diversity

Crops	Total (N=401) (%)	Dedza (n=96) (%)	Salima (n=305) (%)
Maize	99.3	99.0	99.3
Irish Potato	0.7	1.0	0.7
Cassava	9.7	2.1	12.1
Rice	19.0	0.0	24.9
Sorghum	1.7	2.1	1.6
Millet	0.2	0.0	0.3
Sweet potato	4.7	3.1	5.2
Groundnuts	44.6	64.6	38.4
Soya	20.4	71.9	4.3
Beans	14.5	44.8	4.9
Cowpeas	14.2	0.0	18.7
Pigeon peas	1.2	0.0	1.6
Sunflower	0.2	5.2	0.3
Pumpkin leaves	8.0	1.0	10.2
Tobacco	2.5	3.1	2.3
Cotton	10.7	0.0	14.1

Around 30% of the respondents reported to have a home garden. Households with home gardens were asked whether they grew vegetables and what was their main use of the produces. Likewise, access to fruit and ownership of livestock in addition to their respective usages were assessed (Table 12). Less than one-third of the households had a home garden. In Dedza, the number of households having a home garden was almost twice as high as in Salima (Dedza 45.8%, Salima 27.1%). Furthermore, among the households growing vegetables, the majority used it for consumption and sale in equal amounts. As Dedza district boards Lilongwe district, it is likely that vegetables (and fruits) are delivered to Lilongwe. In Salima, more households had access to fruits than in Dedza. The high availability of fruits might be related to the high density of mango trees. During the period of data collection, mango season had started and mangoes as well as pawpaws were available in plenty.

Table 12: Home garden and livestock ownership and main use of produces

	Total (%)	Dedza (%)	Salima (%)
Households without home garden (N=430)	68.8	54.2	72.9
Households with home garden (N=430)	31.2	45.8	27.1
Households growing vegetables (N=136)	77.9	88.6	72.8
Season of vegetable production (N=136)			
- during wet-season	19.8	15.4	22.4
- during dry-season	48.1	53.8	44.8
- year around	32.1	30.8	32.8
Main use of vegetables (N=136)			
- own consumption	35.8	35.9	35.8
- sale	0.9	-	1.5
- both (in approx. equal amounts)	63.2	64.1	62.7
Households with no access to fruits (N=430)	39.4	50.0	36.5
Households with access to fruits (N=430)	60.6	50.0	63.5
Main use of fruits (N=263)			
- own consumption	71.5	70.8	71.6
- for sale	0.8	-	0.9
- both (in approx. equal amounts)	27.7	29.2	27.4
Households not keeping livestock (N=436)	56.4	59.4	55.6
Households keeping livestock (N=436)	43.6	40.6	44.4
Main use of livestock produce (N=187)			
- own consumption	7.5	13.5	6.0
- for sale	21.9	21.6	22.0
- both (in approx. equal amounts)	70.6	64.9	72.0

Respondents were asked if they participated in any social- and/or food-security programmes. Access to agricultural development programmes was mentioned mostly but not many households actually participated (22.5%). Households in Salima seem to have better access to school feeding programmes whereas more households in Dedza receive food aid. Only 7% of the households benefit from social cash transfer (Table 13).

Table 13: Households participating in social- / food-security programmes

Social / food-security programme	Total (n=436) (%)	Dedza (n=90) (%)	Salima (n=340) (%)
School feeding	15.6	6.3	18.2
Agriculture Development	22.5	20.8	22.9
Social cash transfer	7.1	5.2	7.6
Food Aid	9.9	14.6	8.5
Others	2.8	2.0	2.9

4.3. Household food insecurity

In order to assess food security of the households the standardised HFIES, developed by FAO, was used (FAO 2015). Respondents were asked if they or anyone else in their household (1) were worried about not having enough food, (2) were unable to eat healthy and nutritious food, (3) ate only a few kinds of foods, (4) had to skip a meal, (5) ate less than she thought she should, (6) ran out of food, (7) were hungry but did not eat (if yes, how often), (8) went without eating for a whole day (if yes, how often). The reference period was the previous four weeks (one month). As presented in Table 14, only 2.8% of respondents were categorised as food secure and most respondents (60.3%) were suffering severe food insecurity. In 2015, the harvest was very low due to limited rainfall.

Table 14: Household Food Insecurity Experience Scale (HFIES)

Classification of food security	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
		2.1	2.9
Mildly food insecure	9.4	6.3	10.3
Moderately food insecure	26.8	25.0	27.4
Severely food insecure	60.3	66.7	58.5

4.4. Water, Sanitation and Hygiene

Drinking water from an improved source was defined as water coming from piped water into dwelling, yard or plot, public tap or standpipe, tube well or borehole, protected dug well or protected spring (the well is covered by a concrete curb and cap) and rainwater collection. The majority of the survey population had access to improved drinking water year-round. During the wet season and the following cold season, improved drinking water was accessible for 88.8% of the surveyed households (75.0% in Dedza, 92.6% in Salima), while during the hot and dry season (when boreholes tend to dry up), improved drinking water was accessible for 88.3% of the surveyed households (71.9% in Dedza, 92.9% in Salima).

Respondents were asked to freely recall how they store water. The answers were assigned to three predefined categories presented in Table 15. The category “clean and covered container/jar” is the most improved way to store water. Not cleaning containers/jars before usage increases the risk for pathogens to multiply easily and contaminate the stored water. Not covering containers increases the risk for pathogens to enter the water for example through contact with dirt/dust (carried though the wind) or animals drinking the water.

Table 15: Storage of water

Way to store water	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Clean container/jar	9.2	14.6	7.6
Covered container/jar	39.9	39.6	40.0
Clean and covered container/jar	50.2	44.8	51.8

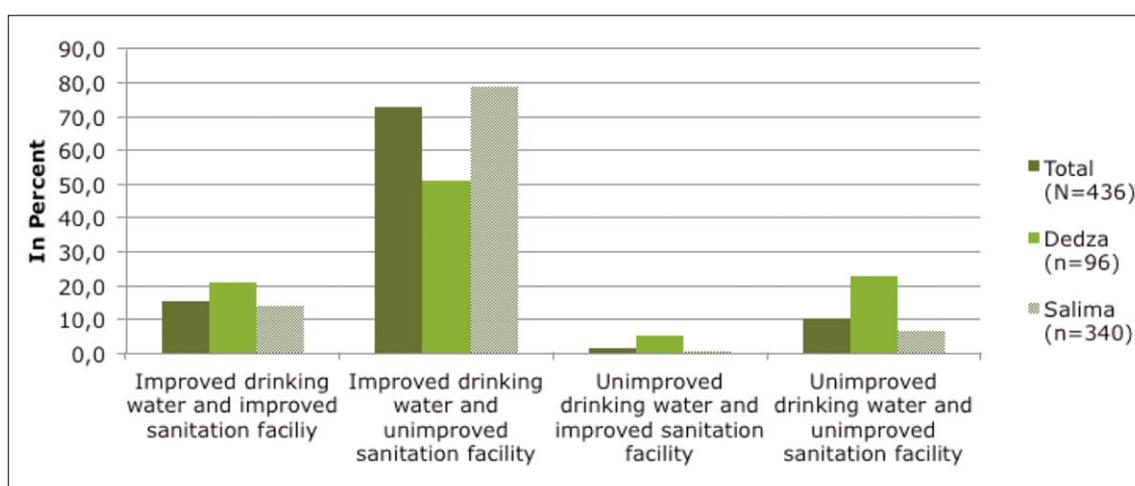
Respondents were further asked, if they were treating their water to make it safer to drink. Only 47% treated their drinking water (33% in Dedza, 50.9% in Salima). However, most households had access to improved sources of drinking water. Table 16 shows freely recalled descriptions of respondents explaining how they usually treated drinking water to make it safer to drink.

Table 16: Mentioned treatment of water for safe consumption

Treatment of drinking water	Total (N=436) (%)	Dedza (n=96) (%)	Salima (n=360) (%)
Not treating drinking water	53.0	66.7	49.1
Treating drinking water	47.0	33.3	50.9
Boil it	18.5	53.1	12.1
Adding bleach/ chlorine	75.6	34.4	83.2
Strain it through a cloth	4.9	9.4	4.0
Other	1.0	3.1	0.6

The majority of households were using an unimproved **sanitation** facility (82.8%), which was defined as the absence of a flush or pour-flush toilet piped sewer system, septic tank, flush to pit latrine; ventilated improved pit latrine; pit latrine with slap; and composting toilet. Shared sanitation (with other households or public sanitation e.g. school latrines) was defined as unimproved sanitation facilities⁴, which might be a reason why usage of improved sanitation facilities was quite low. In Dedza, 26% of households had access to improved sanitation facilities, while in Salima only 14.7% had access to improved sanitation facilities. As the population density in Salima was higher, more people might have to share sanitation facilities than in Dedza. Figure 5 shows the combination of the percentage of households with access to (un-) improved water and (un-) improved sanitation facilities. Most households had access to improved drinking water, but not to improved sanitation facilities. Only 15.6% had improved drinking water and improved sanitation facilities.

Figure 5: Access to improved/unimproved drinking water and sanitation facility



4 Shared facilities were defined as unimproved because they can be less hygienic than facilities used by a single household. Unhygienic conditions (faeces on the floor, seat or wall, and flies) may discourage use of the facility.

Soap was available in less than half of the households at the time of the interview, namely 44.7%. The last time the respondent used soap was mainly for personal hygiene (taking bath) and cleaning homes and dishes (Dedza 100%, Salima 99.1%). If respondents mentioned to use soap for washing hands, the enumerators had to probe for the occasion⁵. Washing hands with soap was very uncommon, as 72.5% did not mention using soap for washing hands (Table 17).

Table 17: Use of Soap for washing hands

Hand washing occasion	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
	72.5	82.3	69.7
Washing children's hands	6.9	3.1	7.9
Washing hands after defecation	19.0	12.5	20.9
Washing hands after cleaning the child	5.7	6.3	5.6
Washing hands before feeding the child	1.4	0	1.8
Washing hands before preparing food	0.7	0	0.9
Washing hands before eating	2.5	1	2.9

Overall, the hand washing behaviour with soap was very poor in both districts. Further, respondents were asked to describe step by step how they usually washed their hands. Sharing a bowl of water with other people and not using soap was classified as the least improved hand-washing practice, since the water is only clean for the first person. Furthermore, people considered of lower status like women and children usually wash their hands at the very end. An improved hand-washing practice is when someone pours water from a jug onto someone's hands, or under running water from a tip-bottle or tap. Using soap or ashes in addition to pouring or running water is the most improved option. Many respondents (43.6%) mentioned the least improved option. However, more than half of the respondents stated to wash their hands with someone pouring water from a jug onto one's hands or under running water with soap or ash (51.1%). Conversely, 72.5% of respondents did not mention washing hands when being asked for what occasion they were using soap last time (Table 18).

Table 18: Mentioned ways of washing hands

Hand-washing practice	Total (N=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Washes hands in a bowl of water (sharing with other people) without soap/ash	43.6	43.8	43.5
Washes hands in a bowl of water (sharing with other people) with soap/ash	4.1	3.1	4.4
Washes hands with someone pouring water from a jug onto one's hands or under running water without soap/ash	1.1	0.0	1.5
Washes hands with someone pouring water from a jug onto one's hands or under running water with soap/ash	51.1	53.1	50.6

⁵ Washing hands with ashes was not considered in this question.

The enumerator conducting the interview explained to the respondent that food poisoning often results from contact with germs from faeces. Afterwards, respondents were asked to freely recall what they could do to avoid sickness from germs from human or animal faeces. Almost two-thirds of the respondents (64.2%) mentioned that washing hands can avoid food poisoning, followed by covering your food to protect it from flies (Table 19). However, covering food was not described further or checked for sufficient protection against flies. The mean number of mentioned ways to avoid food poisoning was 1.4 (± 0.6) (Md=1, Min=0, Max=3).

Table 19: Mentioned ways to avoid food poisoning

Food poisoning can be avoided by...	Total (N=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Washing hands	64.2	68.8	62.9
Remove faeces from home and surrounding	17.2	14.6	17.9
Cover food to protect it from flies	60.3	54.2	62.1
Wash fruits and vegetables before preparation	3.0	6.3	2.1

Prevalence of hygiene counselling at village level was assessed by asking the respondents if they ever received hygiene counselling. Half of the respondents (47.2%) reported they had never received hygiene counselling (Dedza 49.0%, Salima 46.8%).

4.5. Diarrhoea

High prevalence of diarrhoea as well as frequent diarrhoea episodes can be an indicator for poor sanitation and hygiene environment. Information on child health included the occurrence of diarrhoea in the last two weeks prior to the survey and the frequency of periods of diarrhoea of the child until the day of the interview. Diarrhoea was determined as perceived by the respondent, or as three or more watery stools per day, or blood in stool. The prevalence of diarrhoea within the two weeks prior to the survey was 54.4% (51% in Dedza, 55.3% in Salima). This high prevalence of diarrhoea seems to be normal in this population considering that only 8.3% of the children never had diarrhoea since they were born. On average children had 3.5 (± 3.3) times diarrhoea (Md=3, Min=0, Max=30) since birth, with a range from 1-30 times. This results shows that diarrhoea is a constant problem among this population.

4.6. Knowledge, attitude and practice in regard to health aspects

All respondents were either the child's mother or the primary female caretaker of the child. The mean age of respondents was 27.5 (± 6.8) years (N=424, Md=26, Min=15, Max=45). Twelve mothers did not know their age or year of birth. During their last pregnancy, respondents received antenatal care mean times of 3.9 (1.6) (N=436, Md=4.0, min=0, max=10). Thirteen respondents (3%) did not know the number of times they received antenatal care during their last pregnancy. The recommended least number of antenatal care visits of 4 times was achieved by 56.5% of enrolled women. The mean number of under 5 clinic visits

with the enrolled child was 10.8 (± 4.9) times (N= 436, Md=11, Min=1, Max=23.). Twenty-nine respondents (6.7%) did not know how often their child visited the under 5 clinic. Children are supposed to visit the under 5 clinic every month and participate in regular growth monitoring. Considering the mean age of the children (14.6 months), the average number of clinic visits is insufficient and needs to be emphasized in future projects. Most respondents (83.9%) were taking care of the child aged 6-23 months without support of others (Table 20). Respondents were most often supported by their mothers and mothers in law. Other supporters mentioned were respondent's aunt (n=2), husband (n=2), neighbour (n=2), sister (n=1), friend (n=1) as well as her maid (n=1).

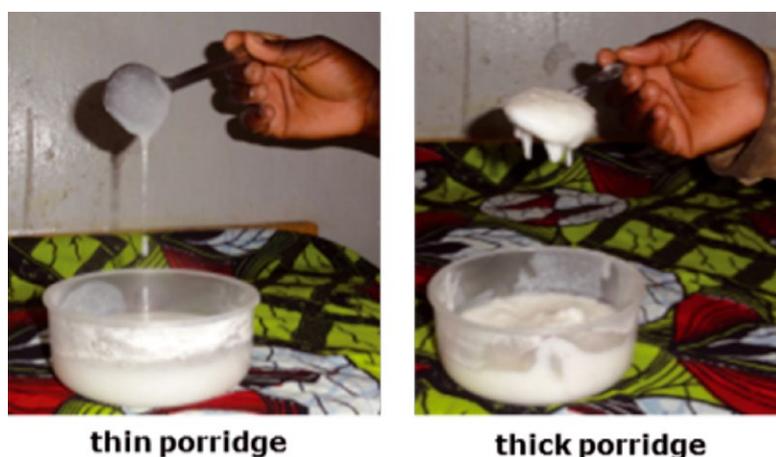
Table 20: Supporter in taking care of the child (6-23 months)

Care taker of the child	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Respondent alone	83.9	87.5	82.9
Mother/ mother in law of respondent	11.5	10.4	11.8
Older siblings of the child	2.3	2.1	2.4
Others	2.3	0.0	2.9

4.7. Knowledge, attitudes and practices regarding complementary feeding

During the interview, the respondents were presented two pictures showing watery, dripping porridge and thick porridge (Figure 6). Then they were asked to choose which porridge consistency they would give to a young child aged between 6 and 12 months. Watery porridge usually contains fewer nutrients compared to thick porridge and watery, nutrient-lacking porridge is one common reason for malnutrition of young children. Therefore, the correct consistency of porridge should be thick and should not be dripping from a spoon. Thin, watery porridge was preferred by most women; only 37% of mothers chose the thick porridge. In Dedza, only 28.1% of respondents chose the thick porridge, while in Salima, 40% of respondents chose thick porridge.

Figure 6: Examples of thin and thick porridge



In addition to the consistency, respondents were asked about ways to enrich the porridge (increase dietary quality). Women were encouraged to freely recall **ways to make porridge more nutritious**. Almost all women (90%) knew that adding pulses will make porridge more nutritious. The benefits of animal source foods (ASF) as well as oil/fat were known by 37% and 27% respectively. Most women were unaware of the nutritional value of green leafy vegetables and Vitamin A-rich fruits and vegetables in this context (Table 21).

Table 21: Mentioned types of food making porridge more nutritious

Additions to porridge	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
	37.4	34.4	38.2
Pulses	90.1	86.5	91.2
Vitamin A-rich fruits and vegetables	4.1	4.2	4.1
Green leafy vegetables	13.3	11.5	13.8
Oil/ fat	27.3	27.1	27.4

Most respondents only knew one (39.4%) or two (33.9%) types of food that would make porridge more nutritious. The mean number of mentioned types of foods was 1.6 (± 0.9) (Md=2, Min=0, Max=4). Almost 10% of the respondents did not know any way to enrich porridge. Pulses were the most commonly known foods to enrich porridge (90%), followed by animal source foods (37%) and oil/fat (27%). Most respondents were unaware of the nutritional value of dark green leafy vegetables and especially vitamin A-rich fruits and vegetables.

When asked to freely recall **signs of malnutrition**, more than half of the respondents mentioned weight loss/thinness (57.6%) and lack of energy/weakness (51.6%) as signs of malnutrition (Table 22). Growth faltering, which is very common in the survey region, was only recognized as a sign of malnutrition by 30% of the women. Most of the respondents only mentioned one (52.3%) or two (39.4%) signs of malnutrition. Some respondents (6.0%) did not mention any of the predefined answers. The mean number of mentioned signs of malnutrition was 1.4 (± 0.6) (Md=1, Min=0, Max=4).

The most commonly known **reason for malnutrition** was not getting enough food (85.9%). Watery food with lack of nutrients was mentioned by only 10.3%. Unmet higher energy- and nutrient-requirements during episodes of illness as reason for malnutrition were known by 37% of the respondents (Table 22). Almost all respondents (94.7%) were able to mention at least one reason of malnutrition. Only 1.8% of respondents were able to mention all three predefined reasons for malnutrition (Dedza 4.2%, Salima 1.2%). The mean number of mentioned reasons for malnutrition was 1.3 (± 0.6) (Md=1, Min=0, Max=3).

Table 22: Mentioned signs and reasons of malnutrition

Signs of malnutrition	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Lack of energy/ weakness	51.6	50.0	52.1
Weakness of the immune system	8.0	6.3	8.5
Loss of weight/ thinness	57.6	61.5	56.5
Growth faltering in children	30.3	38.5	27.9
Reasons of malnutrition			
Not getting enough food	86.9	88.5	86.5
Watery food with lack of nutrients	10.3	13.5	9.4
Illness and not getting enough food	36.5	34.4	37.1

Furthermore, respondents were asked to freely recall how to **prevent malnutrition among young children** (6-23 months). More than half of the respondents mentioned that malnutrition could be prevented through giving more food (56%). This was followed by giving diverse food each day (40.1%) and feeding frequently (39.7) (Table 23). The mean number of mentioned ways to prevent malnutrition was 1.4 (± 0.8) (Md=1, Min=0, Max=4). Most of the respondents only mentioned one (50.5%) or two (29.8%) ways to prevent malnutrition in young children. Some respondents (9.6%) did not mention any of the predefined answers. The mean number of ways to prevent malnutrition was 1.4 (± 0.8) (Md=1, Min=0, Max=4).

Table 23: Mentioned ways to prevent malnutrition in young children (6-23 months)

Prevention of malnutrition	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
Give more food	56.0	46.9	58.5
Give diverse food each day	40.1	39.6	40.3
Feed frequently	39.7	40.6	39.4
Give attention during meals	5.5	7.3	5.0
Attend growth monitoring	5.3	4.2	5.6

Respondents were further asked about their feeding practice regarding amounts of fluids (including breast milk) and food⁶ offered during episodes of illness (Table 24). There is the common belief that it is a waste of fluids and foods to feed a sick child as the sick body is not able to absorb fluids and nutrients. About 48% of respondents were offering nothing, much less or somewhat less to drink during episodes of illness. Furthermore, 68% were offering nothing, much less or somewhat less foods during episodes of illness.

6 If child already takes food

Table 24: Amount of fluids and food offered during illness

Amount of fluids offered during illness	Total (n=433) (%)	Dedza (n=95) %	Salima (n=338) %
nothing	1.2	1.1	1.2
much less	5.5	10.5	4.1
somewhat less	41.8	38.9	42.6
about the same	37.9	36.8	38.2
more	13.6	12.6	13.9
Amount of food offered during illness	Total (n=430) (%)	Dedza (n=94) %	Salima (n=336) %
nothing	1.6	3.2	1.2
much less	7.2	9.6	6.5
somewhat less	60.2	60.6	60.1
about the same	27.2	24.5	28.0
more	3.7	2.1	4.2

4.8. Nutrition Counselling

To identify the availability of nutrition counselling structures at village level, respondents were asked to name any counselling structures for nutrition in their villages. Most of the villages (85.1%) did not have a nutrition counselling structure in their village (Table 25). Among villages having a nutrition counselling structure, Health Surveillance Assistances (HSAs) were most often mentioned (10.3%).

Table 25: Counselling structure for nutrition in the village

Nutrition counselling structure	Total (n=436) (%)	Dedza (n=96) (%)	Salima (n=340) (%)
No counselling structure	85.1	86.5	84.7
Health Surveillance Assistances	10.3	10.4	10.3
Volunteer group	2.8	2.1	2.9
Agricultural extension service	0.2	0.0	0.3
Other	1.6	1.0	1.8

In the study area, more than half of the respondents (52.1%) did not receive any nutrition counselling (Table 26). However, 43.8% received nutrition counselling from HSAs. Other mentioned counselling options as SUN (n=2), parents (n=2), Concern Universal (n=1), school teacher (n=1), local NGO (n=1), and village headman (n=1).

Table 26: Received nutrition counselling among respondents

Source of nutrition counselling	Total (n=436) (%)	Dedza (n=96) (%)	Salima (340) (%)
Received no counselling	52.1	53.1	51.8
Health Surveillance Assistance	43.8	42.7	44.1
Volunteer group	2.1	1.0	2.4
Agricultural extension service	0.2	0.0	0.3
Other	1.8	3.1	1.5

No further questions were asked as to what kind of nutrition counselling was received (individual counselling, group counselling, cooking demonstration), if and what kind of training material they received, and how intense the counselling was in terms of duration and frequency. Over all, nutrition counselling was low. Future projects should ensure or create availability of nutrition counselling and control for compliance among communities.

4.9. Dietary diversity of women 15-49 years

The **mean IDDS-W was 3.9** (± 1.5) (Md=4, Min=0, Max=9), meaning that on average, 3.9 different food groups were consumed the day before the interview (Figure 7). In Dedza, mean dietary diversity was lower than in Salima (Dedza 3.4 (± 1.4) vs. Salima 4.0 (± 1.5)) (Annex H, page 47). Detailed information about food group scores at district level are provided in Annex I (page 47).

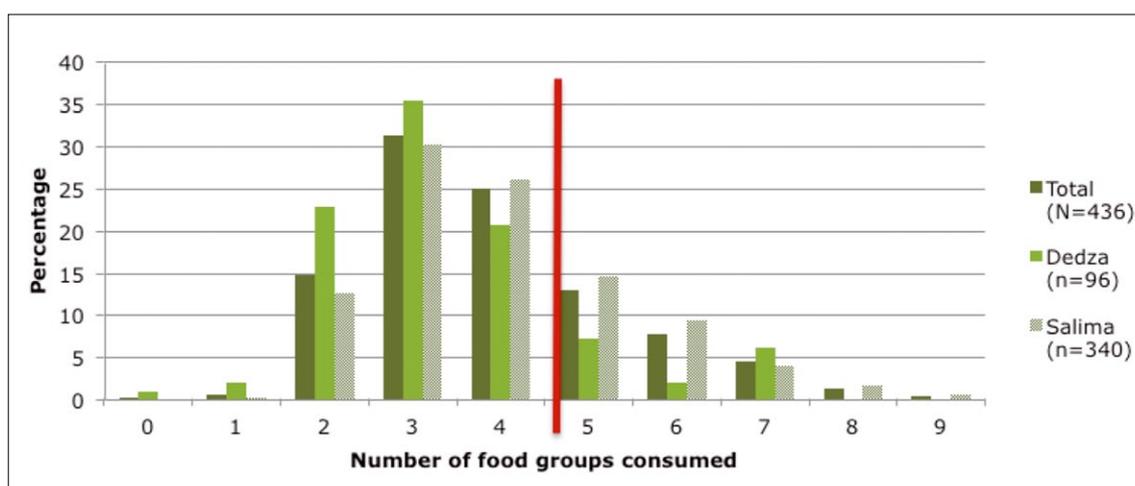
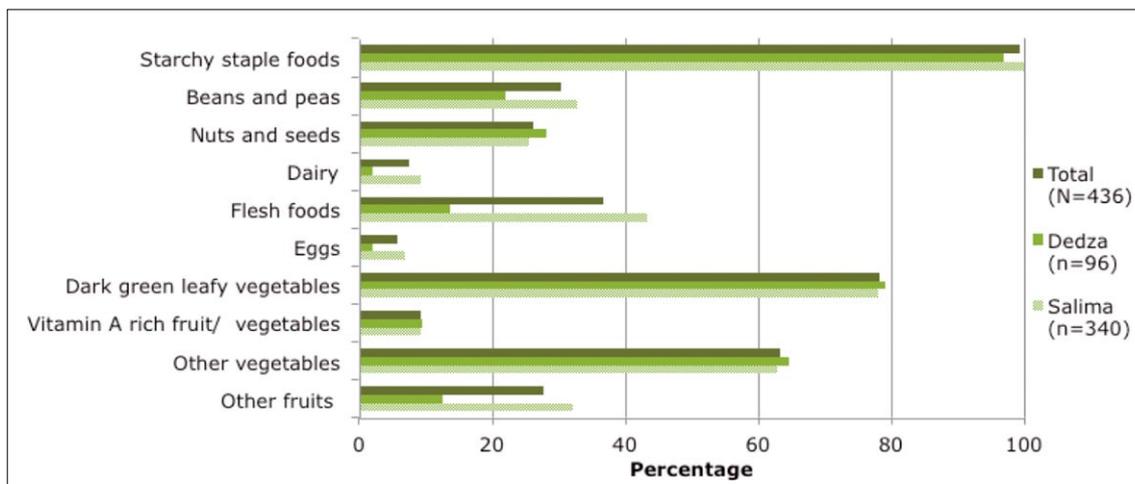
Figure 7: Number of food groups consumed by women 15-49 years

Figure 8 shows that most women consumed starchy staple foods (99.3%), dark green leafy vegetables (78.2%), and other vegetables (63.3%). Only a few women consumed vitamin A-rich fruits and vegetables (9.2%), dairy products (7.6%) and eggs (5.7%). In Dedza, flesh foods were consumed by only 13.5%, while in Salima, flesh foods were consumed by 43.2%. The surveyed TAs in Salima are located close to Lake Malawi which leads to a much higher availability of fish compared to Dedza. Consumption of beans

and peas was lower in Dedza (21.9%) than in Salima (33.6%), as well as other fruits (Dedza 12.5%, Salima 32.1%), dairy products (Dedza 2.1%, Salima 9.1%), and eggs (Dedza 2.1%, Salima 6.8%), respectively.

Figure 8: Prevalence of consumed food groups by women aged 15-49 years



In regard to MDD-W, only 27.3% of the women achieved a minimum dietary diversity of ≥ 5 different food groups. In Dedza, the situation was even worse with only 15.6% achieving MDD-W, while in Salima 30.6% achieved MDD-W. This shows that nutrient adequacy is not achieved among the majority of women and needs to be addressed in upcoming projects. Consumption of orange, vitamin A-rich fruits and vegetables and animal source foods (ASF) rich in iron was especially low in the survey areas. The importance of consumption of such foods should be promoted among communities. In addition, availability but also actual consumption of these foods should be assessed in future monitoring activities of upcoming projects.

4.10. Information on Children aged 6-23 months

The mean age of children between 6 and 23 months was 14.6 (± 5.0) months (Md=14.3, Min=5.6, Max=23.7). Half of these children were girls (50.7%) with a slightly higher percentage in Dedza (53.1% girls, 46.9% boys) and an equal distribution in Salima.

4.11. Dietary Diversity of Children aged 6-23 months

Respondents were asked if the child was ever breastfed, when mothers introduced other foods apart from breast milk, and if the child consumed breast milk the day or night prior to the interview. Almost all children (99.1%) were ever breastfed. At the time of the survey, 91.5% of all children (Dedza 95.8%, Salima 90.3%) were still being breastfed. Children had a mean age of 5.9 (± 1.2) months (Md=6, Min=1, Max=12) when they were first introduced to liquids or foods other than breast milk. Five children did not yet receive any other foods or liquids apart from breast milk.

Individual Dietary Diversity Score

The mean IDDS for children 6-23 months was 3.2 (± 1.3) (Md=3.0, Min=0, Max=6) (see Annex K: page 48). In Dedza, IDDS was lower than in Salima (Dedza 3.0 (± 1.2) vs. Salima 3.2(± 1.0)). Figure 9 presents the number of food groups consumed by children (6-23 months) the day before the interview. Disaggregated according to breastfeeding status, IDDS was slightly lower among breastfed compared with non-breasted children (breastfed 3.1 (± 1.4), non-breasted 3.4 (± 1.4)). (see Annex L and M: page 48).

Figure 9: Number of Food Groups consumed by children (6-23 months)

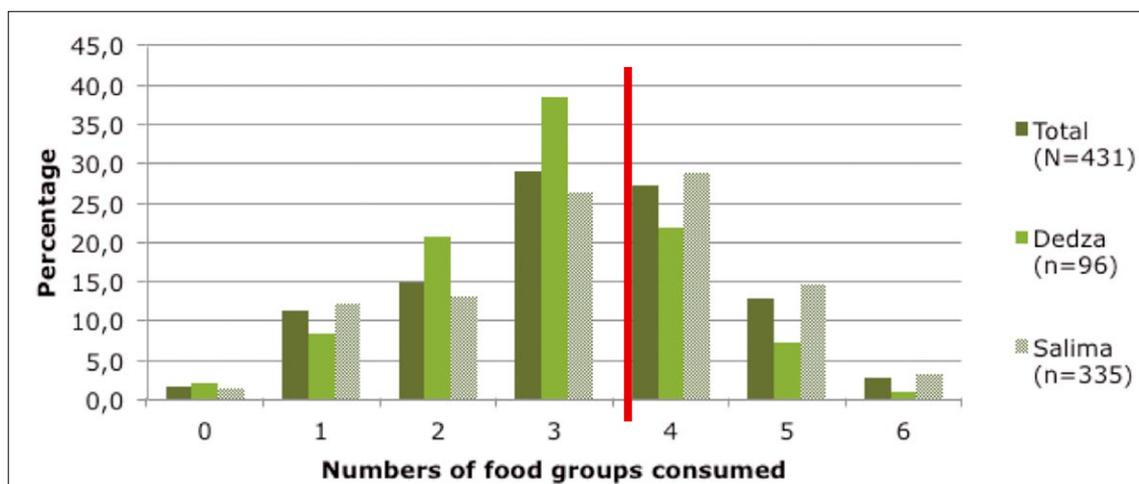
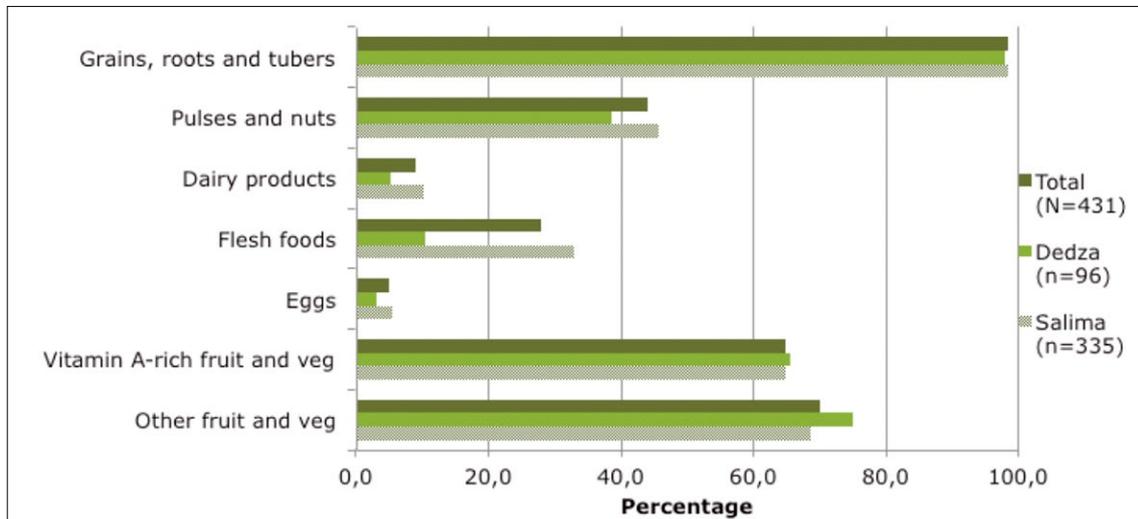


Figure 10 shows the distribution of consumed food groups among children 6-23 months. Almost all children consumed grains, roots and tubers (98.2%). About two-thirds of children consumed other fruits and vegetables (69.3%), and vitamin A-rich fruits and vegetables (64.4%). Only 5.0% of children consumed eggs. In Dedza, consumption of other fruits and vegetables was higher than in Salima (Dedza 75.0%, Salima 67.6%). However, consumption of protein rich foods, namely meat, eggs as well as pulses and nuts was lower in Dedza than in Salima. In Dedza, flesh foods were consumed by only 10.4%, while in Salima, flesh foods were consumed by 32.4%. Also, consumption of pulses and nuts was lower in Dedza (38.5%) than in Salima (45.3%).

**Figure 10: Prevalence of consumed food groups all children 6-23 months
Minimum Dietary Diversity**



Less than half (42.9%) of all children (6-23 months) achieved minimum dietary diversity of equal or above 4 different food groups consumed the day before the interview.

Minimum Meal Frequency

Respondents reported that 98.2% of the children received any kind of food apart from breast milk the previous 24 hours. Mean feeding frequency for children (6-23 months) was 3.0 (± 1.2) times within the last day (Md=3.0, Min=0, Max=9) (see Annex N: page 48). The percentage of children being fed the minimum numbers of times or more was 69.7%. In Dedza, MMF was more than 10% lower than in Salima (Dedza: 59.4%, Salima 72.6%). Disaggregated according to breastfeeding status, 71.4% of breastfed children and 51.4% of non-breastfed children achieved MMF (Dedza 58.7% (breastfed), 75.0% (non-breastfed); Salima 75.2% (breastfed), 48.5% (non-breastfed)).

Minimum Acceptable Diet

The WHO indicator MAD includes all children ≥ 6 months who at least received the MMD of 4 different food groups and the minimum age appropriate meal frequency apart from breast milk during the previous day. Overall, one third of breastfed children (33.5%) received MAD. Among non-breastfed children, no child achieved MAD. Table 27 presents the percentage of children achieving MAD, MMF and MDD.

Table 27: Children (6-23 months) achieving MMF, MDD, and MAD

IYCF Indicator	Total (%)	Dedza (%)	Salima (%)
Minimum meal frequency (MMF)	69.7	59.4	72.6
<i>breastfed (n=394)</i>	71.4	58.7	75.2
<i>non-breastfed (n=37)</i>	51.4	75.0	48.5
Minimum dietary diversity (MDD)	42.9	30.2	46.5
<i>breastfed(n=394)</i>	41.6	28.3	54.5
<i>non-breastfed (n=37)</i>	56.8	75.0	45.6
Minimum acceptable diet (MAD)	33.5	22.9	36.5
<i>breastfed (n=394)</i>	36.8	22.9	36.5
<i>non-breastfed(n=37)</i>	0.0	0.0	0.0

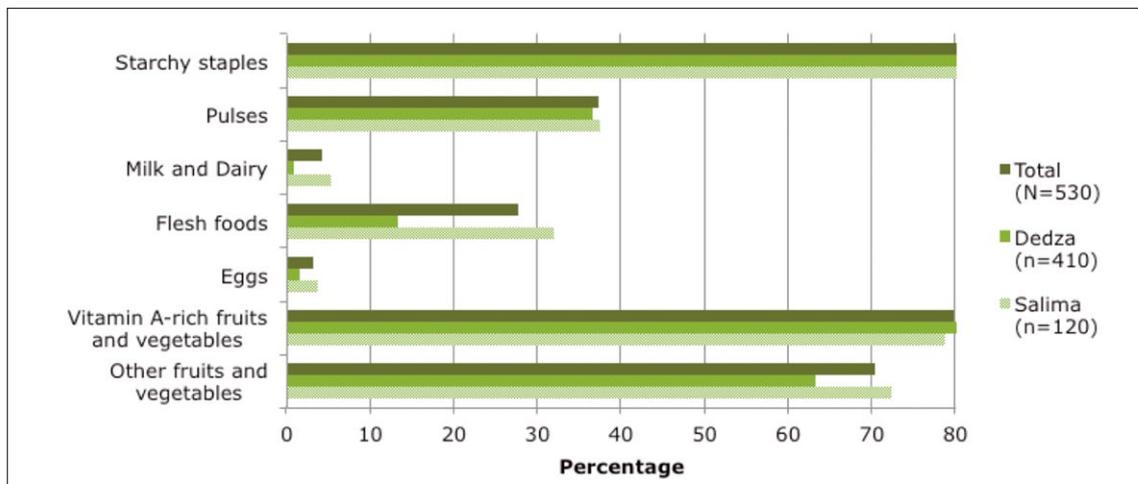
Respondents were asked if the enrolled child's recorded food intake was different from usual. A high number of respondents, namely 43.8% reported that the food consumed by the child was different than usual. In Dedza, the percentage of respondents describing unusual food consumption was lower than in Salima (Dedza 33.3%, Salima 46.8%). The high prevalence of food insecurity at the time of data collection (compared to previous years (FEWS NET 2015)) might have affected the responses.

The overall low consumption of vitamin-rich foods and iron-rich foods and low rate of children achieving MAD show that nutrient adequacy is insufficient among the majority of that target group. Also the limited knowledge among mothers on how to nutritionally enrich porridge need to be addressed in future nutrition counselling programs. Such programs should not only provide mothers with theoretical knowledge, but also include active cooking classes with locally available foods.

4.12. Dietary Diversity of Pre- and Primary School Children

In total, 530 pre- and primary-school children with a mean age of 5.8 (± 2.6) years (Md=6, Min=2, Max=15) were enrolled in the current survey. Forty-seven percent were boys and 53% were girls. Disaggregated according to pre- and primary school children, mean age of pre-school children was $3.7 \pm (0.9)$ years and mean age of primary school children was $7.8 (\pm 2.0)$ years. In the group of pre-school children, slightly more boys than girls were enrolled, while in the group of primary school children, more girls than boys were enrolled. Up to today, there is no standardised dietary diversity indicator for these age groups. In order to compare it to the group of children 6-23 months, indicators were based on the same 7 food groups.

The mean IDDS for all pre- and primary school children was $3.3 (\pm 1.0)$ (Md=3.0, Min=1, Max=7) (see Annex O: page 49). Disaggregated into age group 2-5 and ≥ 6 years, the IDDS was the same with a mean IDDS of 3.3 food groups per respondent. However, among children older than 6 years, the mean IDDS in Salima was higher than in Dedza (see Annex P and Q, page 49). Figure 11 shows that almost all children consumed grains, roots and tuber, followed by vitamin A-rich fruits and vegetables (79.8%) and other fruits and vegetables (70.4%). Consumption of eggs (3.2%) and dairy (4.4%) was low among all children. In Salima, flesh meat consumption was two times higher than in Dedza (Dedza 13.3%, Salima 32.0%).

Figure 11: Food groups consumed by pre- and primary school children

The results show that nutrient adequacy was also low in these age groups showing that nutrition programs should not only target reproductive women and children between 6-23 months of age, but also include pre- and primary school children. Such programs may include nutrition education as part of the curriculum in early child development centres or primary schools, school feeding programmes, and school gardens. Adequate nutrition is not only vital for a continuous healthy development of the child, but also for its school performance, and thus, chances to achieve a higher educational status.

4.13. Observations

As recommended in the guidelines for the nutrition baseline survey, the questionnaire should allow the documentation of observations. During the training, enumerators developed a common understanding on how to observe and record observations of the household. Observations were based on the following criteria:

- **Observations of the household surrounding:** General cleanliness of the surrounding (dirt, faeces), condition of the house (walls, roof), storage of dishes
- **Observations of the respondent:** Cleanliness, health status and clothes of mother
- **Observations of the child 6-23 months:** Cleanliness, health status and clothes of child

The observation of the household, respondent and child was ranked on a 5-item scale, ranging from very good, good, ok, bad, to very bad. These items were represented via smileys. Observations were made and discussed by enumerator pairs after each interview. Generally, household surroundings, appearance of mothers and children were rated as good (Figure 12-14).

Figure 12: Observations of household surrounding

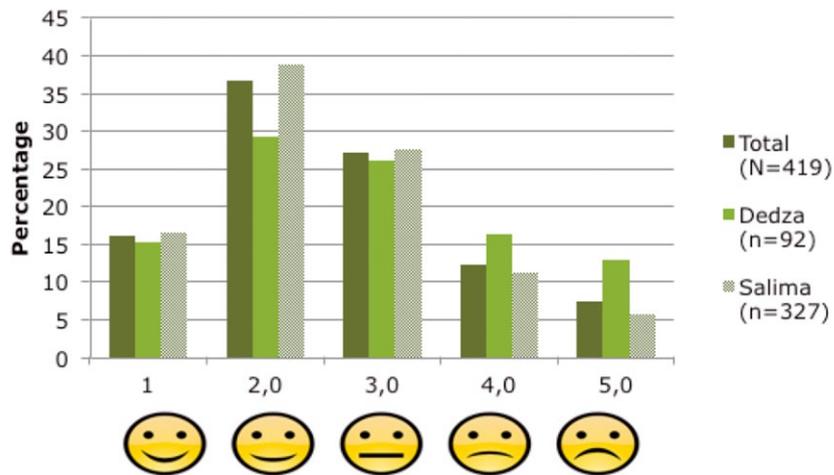


Figure 13: Observations of appearance of the respondent

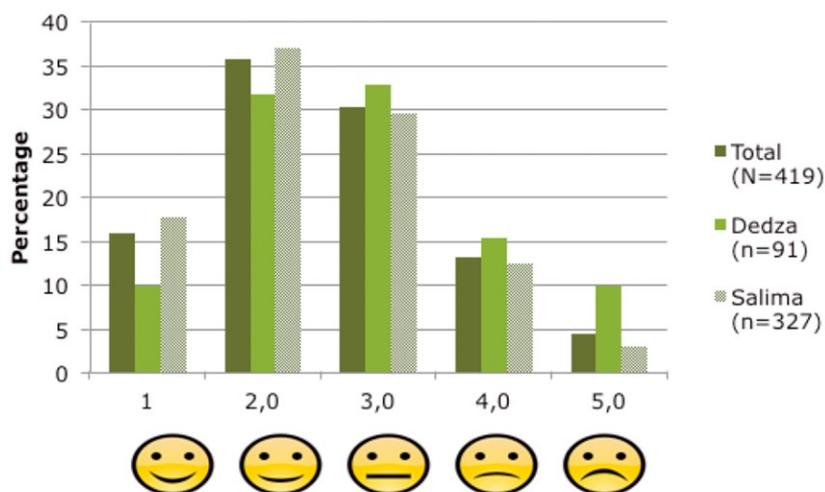
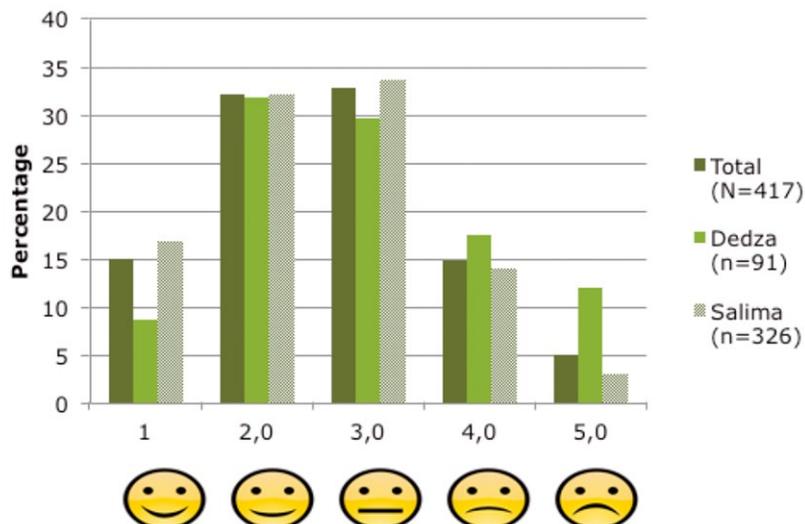


Figure 14: Observations of appearance of child (6-23 months)





5. CONCLUSIONS & RECOMMENDATIONS

The current nutrition baseline survey, which was conducted in August and September 2015, describes the nutrition and food security situation of households in four selected Traditional Authorities in Dedza and Salima districts, Malawi. Conclusions and related recommendations are presented in accordance to the causal model of malnutrition (UNICEF 1990) (Annex, page 77) and its underlying as well as immediate causes of malnutrition.

Main conclusion	Recommendation
<p>Food and Nutrition security situation</p> <p>60% of HH are severe food insecure (HFIES- applied in the post-harvest season, 4 months after harvest). The high prevalence of severe food insecurity is probably caused by the dependence on maize as the main crop grown and the general low crop diversity.</p>	<ul style="list-style-type: none"> · It should be promoted that people participate in social and/or cash transfers programmes, especially during the lean season to balance food shortages at household level. · The project should investigate the specific causes of this food insecurity situation (maize dependence, low income for women, crop diversity, availability of qualitative food on the market, knowledge to buy adequate food etc.) · Regular assessments of levels of food insecurity (provisioning) throughout the project area (subsample, every 4 months) are recommended as part of the monitoring system
<p>Concerning the immediate causes of malnutrition:</p> <p>Food intake (food use)</p> <p>Dietary diversity of children 6-23 months of age was low (57% <4 food groups). On average, children in this age group consumed three food groups (mainly "grains, roots and tubers", "vitamin A-rich fruit and vegetables", and "other fruit and vegetables"). Main source for protein were pulses, consumed by around 40% of the children. Animal source foods (ASF) were less consumed. The observed prevalence of minimum dietary diversity (MDD) of 43% is above the national rate of 27% (MDG Endline Survey 2014). A minimum acceptable diet (MAD) was achieved by 34% of the children under two years of age, which was more than twice the national average of only 14% (MDG Endline Survey 2014). However, it is still too low and needs to be addressed in order to improve nutrient adequacy and proper development of the children.</p> <p>Dietary diversity of pre- and primary-school children was low as well (65% <4 food groups). The majority consumed only three different food groups (mainly "grains, roots and tubers", "dark green leafy vegetables", and "other fruit and vegetables"). Like in younger children, pulses were the main source for protein; ASF played a minor role. There are no national data available for this age group.</p> <p>Dietary diversity of women was even lower than for children (73% <5 food groups). On average, women consumed four different food groups (mainly "grains, roots and tubers", "dark green leafy vegetables", and "other vegetables", as well as either "beans and peas" or "nuts and seeds").</p> <p>The lowest consumed food groups in all three target groups were "dairy (products)" and "eggs". While dairy products are expensive and require refrigeration, eggs might be more easily accessible for rural households.</p> <p>A comparison of values assessed by the Household Food Insecurity Experience Scale (HFIES) and dietary diversity scores shows that dietary diversity among all target groups was highest amongst food secure households (Table 28, page 35).</p>	<ul style="list-style-type: none"> · Improve dietary diversity through nutrition education: teaching women the benefits of diversified and healthy diets empowers them to make healthier choices and can increase dietary diversity · Increase consumption of pulses: <ul style="list-style-type: none"> · Improve school meals by including pulses in order to improve dietary diversity in pre-and primary school children · Improve diet of children under two and women by providing information regarding the nutritional benefits and value of pulses · Qualitative interviews should be conducted to identify barriers of egg consumption within the next project activities. Superstitions against feeding eggs to young children might be widespread. · Reaching women with young children 6-23 months via schools seems feasible (60% of the households have children already in primary school and 60% of households have pre-school children) · Monitoring: regular assessment of women dietary diversity and dietary diversity of pre- and primary school children throughout the project area (subsample, every 4 months together with HFIES) are recommended. · Since levels of food insecurity are high (dietary diversity depends on the food security situation and seasonality) regular assessment of HFIES and dietary diversity of women and children > 2 is recommended (sub-sample of 2 villages randomly selected per TA) especially since national data for both target populations are not available.
<p>Health status (food utilization)</p> <p>The severity of shortcomings regarding the WASH sector is reflected in the high prevalence and frequency of diarrhoea in children. More than half of the children (>54%) under two years of age were suffering from diarrhoea within two weeks prior the survey. This figure is more than twice as high as the national average of 24% (MDG Endline Survey 2014). On average, children suffered from at least 3 episodes of diarrhoea. Frequent episodes of diarrhoea can easily lead to malnutrition and therefore have a negative impact on the development of children.</p>	<ul style="list-style-type: none"> · Identification and elimination of main contamination ways that might influence diarrheal infection (hygiene, water-borne diseases, food safety). Ensure recognizing diarrhoea as a serious health-threat for young children (hygiene counselling, implication of health promoters at village level). Ensure adequate treatment is available as well as asked for mothers regularly (Monitoring). The care givers should assure that breastfeeding and food intake continues during diarrhoea. · Nutritional and hygiene messages should be harmonised with the local health structures and practiced.

Main conclusion	Recommendation
<p>Concerning the underlying causes</p> <p>Availability of food through own agricultural production and trade</p> <p>Land availability was high (>90%) in both districts, but average landholding size is generally very low in Malawi. According to national data, average land holding size is 3.6 acres, and around 70% of rural households only have access to up to 2 acres.</p> <p>Crop diversity was low (mean = 2.3) with a high dependence on maize as the main crop grown (99%). Households in Salima seemed to be less dependent on maize as staple food. Production of cassava (10%) and rice (22%) as complementary staples and cotton (13%) as cash crop is possible in the area. Cultivation of protein-rich pulses like soya, groundnuts and beans is more common in Dedza than in Salima. The climatic conditions at higher altitudes in Dedza are probably better for growing pulses compared to the higher temperatures and different soil conditions in Salima. Cowpeas seem to be adapted to the conditions in Salima since only households in Salima were growing cowpeas (19%).</p> <p>Home gardens or kitchen gardens are a possibility to grow fruit and vegetables for home consumption as well as for income generation, diversification of the daily diet and probably increasing food security. Ownership of home gardens was low (31%) and most households with a home garden were found in Dedza. This might also be related to the higher population density along the lake shore in Salima as well as better soils and climatic conditions in Dedza. Production of vegetables among households with kitchen gardens was common (78%) however, most households only used 50% of the produce for own consumption and sold the other half. Production of vegetables is dependent on the season (48% dry season), but some households managed to grow vegetables year around.</p> <p>Keeping livestock was limited in the survey area (44%) and most households keeping livestock sold half of their produce (71%). The low number of households keeping livestock as well as the high percentage selling livestock produce is reflected in the low consumption rates of all animal source foods (ASN).</p> <p>Access to food (income, Infrastructure and access to markets)</p> <p>Main sources of income throughout the last year were sale of crops (48%), temporary salary (50%) and petty trade (48%) less than 10% of the surveyed households had a regular salary. On average, households depended on 2 different income sources. The percentage of households generating income by selling agricultural produce was higher in Dedza compared to Salima. The close proximity of Dedza to Lilongwe might be a reason why grown produce was sold (market access).</p> <p>The fact that 60% of households are severe food insecure indicates a strong access and/or availability problem of food at household level. Access to food aid as well as social cash transfer is limited. Only 10% of households received food aid, and 7% of households were benefitting from social cash transfer.</p> <p>Fruit were accessible to 61% of the households and the majority of households used fruit for their own consumption (72%). However, consumption of fruit especially among women was very low (<30%). Between the two districts, main differences in dietary diversity could be observed in the food group "other fruits" which was higher in Salima for women as well as pre-and primary-school children. During the time of data collection, green, unripe-mangoes were commonly consumed because Mango trees are accessible along the shore of Lake Malawi.</p> <p>Food distribution within the household</p> <p>Although in Dedza, most households (89%) with access to arable land grew pulses, the respective food groups (i.e. "beans and peas" and "nuts and seeds") were not consumed by many women or children. On the other hand, production of pulses was not as common in Salima as in Dedza (only 50% of households with access to arable land grew pulses), but consumption of pulses was higher than in Dedza. This result indicates that although foods belonging to the two food groups "pulses" and "nuts" were available in Dedza they were not accessible since usage of such foods for income generation was most likely preferred towards own consumption among several households.</p> <p>Access to fish and consumption of fish was higher in households from Salima district due to the proximity of Lake Malawi.</p>	<p>Availability</p> <ul style="list-style-type: none"> Increasing food availability at household level by identification and promotion of crops adapted to local conditions in Dedza (especially pulses) and Salima (different staples and cowpeas) to encourage crop diversity for own consumption as well as income generation. Measures to increase crop diversity need to consider reaching out to main decision makers (Who is making decisions of what to grow on the arable land?). Information on benefits of diverse diets should be provided to all household members in order to avoid conflicts between income generation and own consumption (especially for pulses). Increasing food availability at household level by encouraging households to establish a home garden. Barriers that prevent households from establishing home gardens and growing vegetables need to be assessed. Distribution of seed starter-kits could encourage more households to establish a home garden. Availability of vegetables year-around could be increased by teaching food processing and preservation techniques. Identifying and strengthening local women's groups around kitchen gardens could be an entry point for introducing nutrition aspects in agriculture. <p>Increasing food availability at household level by encouraging households to keep small scale livestock (e.g. poultry, rabbits). Empower families to make informed decisions about available livestock produce by providing information about the nutritional benefits of ASF especially for children and women. Sustainability of ASF availability could be increased by keeping chicken for eggs rather than meat.</p> <p>Access</p> <ul style="list-style-type: none"> Improve the access to more income (market access, cash transfer) to buy more and diverse food. Improve access to food assistance programmes in the region. Food aid in terms of distributing dry rations to households should only be discussed in case of emergencies. Avoid a conflict between generating income by selling versus consumption for nutritional benefits especially for pulses and animal source foods through increased production of these foods. Elaborate a strategy with local agricultural extension staff. Both districts have different income sources, agro-ecological zones, as well as access to infrastructure which needs to be considered during implementation (different strategies are needed for the locations) If fruit consumption is low despite availability, it would be worth to find out with the households whether conservation such as drying mangoes for cash income might be a more efficient solution than promoting consumption. With the additional cash income, high quality food could also be purchased. Nevertheless, high quality food items should be also promoted for usage in meals by transferring the benefits and additional nutritional value to specific household members. Local fares to demonstrate the best nutritious and economic food preparation organized by young farmers or women's group at village level could have a positive effect on consumption of qualitative food items. Best results to promote the consumption of specific food items are observed when existing traditional meals and compositions of food are enriched with new items. During the community communication on nutrition, enriched meals could be given a specific name as local marketing.

Main conclusion	Recommendation
<p>Care behaviour</p> <p>The educational status of the survey participants was high compared to national data. However, 13% never attended school. Formal education as well as informal education, such as nutrition and hygiene counselling are key elements on the pathway of malnutrition. Dietary diversity is usually lower and malnutrition rates are higher if women are less educated. Thus, education on nutrition and hygiene needs to be strengthened in the communities. Nutrition counselling is very limited in project area (85% of surveyed villages do not have a nutrition counselling structure). Less than 50% of the respondents had received hygiene counselling.</p> <p>Main care taker of children < 2 are mothers. Around 11% of respondents were supported in child care by grandmothers. Grandmothers can have a big influence on decisions related to child feeding and general care (Aubel 2012).</p> <p>Breastfeeding is culturally accepted and practiced comprehensively in Malawi. The assessed breastfeeding rates were high (>90%) and similar to national data (MDHS 2010). Continued breastfeeding after the child reaches six months of age is recommended in addition to complementary feeding.</p> <p>Knowledge of appropriate complementary feeding in terms of dietary quality and consistency is a challenge. Most mothers (>60%) considered watery and nutrient-low porridge as adequate for young children 6-11 months of age. Knowledge about enriching porridge was generally limited. On average, women knew 2 ways to enrich porridge and around 10% did not know any way. Amongst different foods that were stated to enrich porridge, pulses were known by almost all mothers. This demonstrates the discrepancy of knowledge and behaviour, given the fact that only around 40% of children consumed pulses the previous day. Alarming was the lack of knowledge regarding orange, vitamin A-rich fruits and vegetables. Less than 5% of mothers mentioned this food group as one way to enrich porridge. Especially, since ripe mangoes are seasonally available in Salima and orange sweet potatoes are grown in Dedza. Only around 37% of the respondents considered animal source foods (ASF) as a way to enrich porridge. The low consumption rates of ASF might therefore not only be caused by low access and availability but as well by not knowing about the nutritional value of this food group.</p> <p>Especially during episodes of illness, appropriate child feeding is essential for convalescence and prevention of malnutrition. Nevertheless, feeding behaviour during episodes of illness was inappropriate with many respondents offering less fluids (>48%) and foods (>65%) to their children.</p> <p>Knowledge about causes, signs and prevention of malnutrition was very limited. The most common reason for malnutrition mentioned was lacking food in terms of quantity. Around 37% knew that insufficient amounts of food during episodes of illness can cause malnutrition (which explains the high prevalence of inappropriate feeding practice during illness). Only 10% of the respondents mentioned that malnutrition can be caused by watery nutrient-lacking food (which explains the preference of watery porridge). Most mothers were aware that weakness and lacking energy as well as weight loss are signs of malnutrition in young children. Growth faltering which is common in this age group in Malawi and related to low dietary diversity was only recognized as a sign of malnutrition by 30% of the respondents. Diversifying the diet of their children to prevent malnutrition was mentioned by around 40% of the mothers.</p> <p>Knowledge about prevention of (food) contamination with germs was low. Most mothers knew that hand-washing can avoid contamination with germs and that food should be protected from flies. Nevertheless, removing faeces from home and surrounding in order to prevent contamination was not known by many women.</p>	<ul style="list-style-type: none"> · School drop-outs from adolescent girls should be avoided and completing primary education as well as higher education should be encouraged, since education is still the most influencing factor for nutritional behaviour. · Education on nutrition and hygiene needs to be strengthened in the communities: <ul style="list-style-type: none"> · nutritional and health value of diverse diets needs to be communicated · grandmothers, older female household members as well as fathers need to be included in the counselling in order to avoid conflicts at household level · Invite women to cooking demonstrations to explain <ul style="list-style-type: none"> · the appropriate porridge consistency · maximizing dietary diversity with local resources · nutritional value and benefit of available foods (e.g. green leafy vegetables, pulses, ripe mangoes, orange flesh sweet potatoes) · Qualitative interviews may be a useful tool to get insights into the gap between knowledge and practice for monitoring purposes. It is recommended to apply the following tools for assessment: <p>Monitoring at individual level</p> <ul style="list-style-type: none"> - KAP survey with subsample (2 villages randomly selected per TA) of actual program participants to measure direct programme impact. Knowledge levels and behaviour of direct beneficiaries of the project should be assessed before they enrol in the programme and after they have attended the programme (sub-sample pre- and post-knowledge test) - Key-informant interviews to assess barriers of behaviour change (sub sample) - Attendance of program should carefully be recorded for each participant including information of location (village, TA) and sessions attended (information can be linked with knowledge test) <p>Monitoring at institutional level</p> <p>Knowledge levels of direct beneficiaries of the project should be assessed before they enrol in the program and after they have attended the program (sub-sample pre- and post-knowledge test)</p> <ul style="list-style-type: none"> · Monitoring training of multipliers: <ul style="list-style-type: none"> · assess knowledge of multipliers before and after training · establish feed-back and support structure for multipliers during implementation · encourage regular refresher trainings for multipliers
<p>Health services and WASH (water, sanitation, hygiene)</p> <p>Throughout the survey region, access to improved sanitation facilities was very low (17%). Access to improved drinking water was high year-round; however half of the households stored their drinking water under unhygienic conditions increasing the risk of contamination.</p> <p>Most households did not have soap (55%) and hand-washing with soap was not common. Hand-washing practice was generally poor. Many respondents (44%) washed hands in a bowl they shared with other people without using soap or ash. Only 26% of the respondents used soap for washing hands the last time they had soap. The low usage of soap / ash for hand-washing and low knowledge of the contamination with germs through faeces puts the population at high risk of contracting food- and water-borne diseases (see high prevalence of diarrhoea).</p> <p>Most children attended basic health service (under 5 clinic) irregular More than half the women (57%) attended antenatal care ≥ 4 times during their last pregnancy</p>	<ul style="list-style-type: none"> · It is highly recommended to increase the access to improved sanitation facilities. At community level, reaching pregnant women via health services seems feasible · Identification of barriers that prevent mothers and pregnant women to attend basic health services regularly

Table 28: Mean food group score at different levels of food insecurity

Food Group Score Mean (SD)	Household Food Insecurity Experience Scale			
	Food secure	Mild food insecure	Moderate food insecure	Severe food insecure
Women	5.3 (±1.7)	4.8 (±1.6)	4.1 (±1.4)	3.5 (±1.4)
Children 6-23 months	4.2 (±1.4)	3.8 (±1.3)	3.3 (±1.3)	3.0 (±1.3)
Pre-and primary school children	4.2 (±1.4)	3.7 (±1.1)	3.4 (±1.0)	3.2 (±1.1)

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ANNEX

A. List of selected villages

District	TA	Village
Dedza	Chauma	Kambuwe
		Kalamizu
		Njande
		Sapita
		Mwii
		Matipa
		Chilongosa
		Chawala
		Mitawa II
		Mitawa I (additional Village to top up Mitawa II)
		Chizwa
		Mkanda (GVH Gonkho)
		Mtandakwera
		Sete
		Chauma
		Tembwe
		Mnembe (additional villages to top up Tembwe)
		Mkanda (GVH Biwi)
		District	TA	Village
Salima	Ndindi	Paulo
		Mawala
		Chilembe
		Mzwenene
		Mpundu
		Kacheuka
		Chilimani
		Kalonga
		Chembe
		Mikuju
		Chazima
		Mlenga
		Ndevu
		Khwidzi A
		Majora
		Mtika
		Chimenya
		Saidi
		Sanimaganga
		Kandeu
Ngwena		

District	TA	Village
Salima	Maganga	Njelema
		Fisi
		Chizuwi
		Esau
		Thawale
		Chipembedza
		Jonai
		Jumabunguzi
		Kuchilawe
		Kalambo
		Chitukula
		Chifumbi
		Mpondezi
		Kuchimudzi
		Mili Village (additional village to top up Kuchimudzi)
		Mawale
		Kamchemera
		Malimba
		Kaluma
		Mikute1
		Monjeza
		Misimkwanda
		Kunkhongo
		Cholokoto
		Chibwato
		Bushiri
District	TA	Village
Salima	Pemba	Dzoole
		Kutsanja
		Kanyerere
		James
		Tambala
		Chembe (additional village to top up Tambala)
		Mzikita
		Mchongwe
		Pemba
		Mngwale
		Gwirize
		Selemani

B. Selection of clusters proportional to population size

TA	Chauma	Ndindi	Maganga	Pemba
Total population	23322	47614	58701	25361
Number of clusters	10	21	25	11
Mean	2332	2267	2348	2306
Random number	650	118	976	605
1	650	118	976	605
2	2982	2385	3324	2911
3	5314	4652	5672	5217
4	7646	6919	8020	7523
5	9978	9186	10368	9829
6	12310	11453	12716	12135
7	14642	13720	15064	14441
8	16974	15987	17412	16747
9	19306	18254	19760	19053
10	21638	20521	22108	21359
11		22788	24456	23665
23		25055	26804	
13		27322	29152	
14		29589	31500	
15		31856	33848	
16		34123	36196	
17		36390	38544	
18		38657	40892	
19		40924	43240	
20		43191	45588	
21		45458	47936	
22			50284	
23			52632	
24			54980	
25			57328	

C. Overview of interventions in Dedza and Salima under the global programme

	Care International	Concern Universal	Village REACH	Welthungerhilfe
Name of the project	Improving Food Security and Building Resilience	Improving the Food Security of Women and Primary and Pre-school Children in Dedza district	Chipitala Cha Pa Foni "Health Center by Phone"	Health Clubs for Improved Hygiene and Nutrition (CLUBS Project)
Target Area	Salima (Pemba, Maganga, Ndindi)	Dedza (Chauma)	Dedza and Salima	Dedza and Salima
Main Objective	Improvements in maternal and child health and nutritional status	Improving the Food Security of Women and Primary and Pre-school	Improving maternal newborn and child health	Improving the health, hygiene and nutrition practices.
Specific project objectives	<ul style="list-style-type: none"> Develop capacities in nutrition sensitive agriculture and SUN implementation Support and coordinate the governmental stakeholders 	<ul style="list-style-type: none"> Improve food security and support sustainable livelihoods through agricultural Improve health Improve respect for rights (e.g. empowerment of women, children) Improve skills (e.g. literacy marketing) Build resilience to climate change 	<ul style="list-style-type: none"> Improve access to health information and services for families, while decreasing the burden on overtaxed health workers and under-resourced health facilities 	<ul style="list-style-type: none"> The planned target is that >80 % of the CHC members climb the sanitation ladder by at least one step
Expected outcomes	<ul style="list-style-type: none"> Improved capacities of 13,900 households with Pregnant and Lactating Women (PLW) in SUN and nutrition sensitive agriculture interventions in Salima district improved Improved coordination of stakeholder Analyse and shared lesson learned 	<ul style="list-style-type: none"> Increased implementing measures aimed at improving nutrition. The District Nutrition Committee implemented a multi-sector 'School Health and Nutrition Strategy for dietary diversification' (utilisation) and hygiene improvements Experiences are communicated to relevant stakeholders under the national SUN process 	<ul style="list-style-type: none"> The project could make a significant difference in the lives of women and children in rural areas and help Malawi reach its maternal and child health goals 	<ul style="list-style-type: none"> Increased and lasting prevalence of improved hygiene, sanitation and nutrition behaviour and practices of the target population
Target groups	13,900 pregnant and lactating women and 22,000 under five children	5,200 school-going children, 1,045 pregnant and lactating mothers, and 3,552 under-five children working across 6 schools and 1 health facility	Pregnant women, women of child bearing age, and caregivers of young children living in rural areas	Food-insecure people with a special focus on women of childbearing age and infants and young children (0–23 months, under 5 and school aged children). (about 4,200 to 6,000 households being targeted)
Intervention	Establish the care group model: train community nutrition facilitators to run training sessions with care groups. Each will be responsible for care groups comprising of several lead persons per group. Each leader will be responsible to deliver the information of the Information Education and Communication material (focus on IYCF and nutrition of PLW)	Build and scale up on the initial investments and gains realised under SUN-NECs, and to complement existing efforts, further strengthen community structures, and deepen impact particularly in terms of accelerating behaviour change at community levels, as well as providing direct village level support to mothers and young children	<ul style="list-style-type: none"> Toll-free hotline proved clients with information and advice on reproductive, maternal and child health issues Tips and reminder mobile messages services provides regular text or voice messages 	Hygiene promotion and health and nutrition education using the Participatory Health and Hygiene Education (PHHE) approach Applied on household and school level)
Monitoring and Evaluation	<ul style="list-style-type: none"> Quarterly review and planning Regular monitoring visits will be conducted in order to closely monitor implementation of SUN and nutrition sensitive agriculture activities in targeted areas. Mass screening of under 5 children during lean periods 	<ul style="list-style-type: none"> Community growth monitoring of children less than two years. These begin from the Key nutritional data e.g. CMAM performance indicators 		<ul style="list-style-type: none"> Baseline and 6 monthly monitoring of PHHE Index to assess the water, sanitation and hygiene status of the target communities. KAP study on nutrition practices within households M&E plan to include Group Maturity Index to measure performance and sustainability of Community Health Clubs

D. Training Agenda of NBS Enumerator Training

Enumerator Training at Riverside Hotel, Lilongwe, Malawi

Nutrition Baseline Survey

17.08.2015 – 22.08.2015

Monday	Topic	Tools	Responsible
08:30 – 09:30	Opening remarks and overview of SEWOH Introduction of survey team and enumerators Icebreaker	enumerator bag name tags/ markers flipchart, pens	KA, JK, EE
09:30 – 10:00	Training objectives, expectations and ground rules for workshop	flipchart paper/ pencils PPT	JK, EE
10:00 – 10:15	Overview of Training Activities/Workshop Agenda/ logistics for the field	handouts	EE
10:15 – 10:45	Explanation of the survey process and roles/responsibilities of team members (team leader, supervisors and data collectors) Focus on role and contribution of the supervisors and enumerators	Projector, PPT presentation/ flipchart paper/ pencils	JK
10:45 – 11:00	Coffee/Tea break		
11:00 – 12:30	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaire, Projector	EE, JK
12:30 - 13:30	Lunch break		
13:30 – 15:00	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaire, Projector	EE, JK
15:00 – 15:15	Coffee/Tea break		
15:15 - 16:45	Review & translation of questionnaire Questions and answers to the questionnaire	Questionnaire, Projector	EE, JK
16:45 – 17:00	Wrap up of day, feedback	Flipchart markers	JK
Tuesday	Topic	Tools	Responsible
08:30 – 09:30	Briefing of day's agenda, group warm up, finalizing review of questionnaire	Questionnaire, Projector	JK
09:30 – 10:45	Introduction of tablets		BA
10:45 – 11:00	Coffee/Tea break		
11:00 – 12:30	Introduction of tablets		BA
12:30 - 13:30	Lunch break		
13:30 – 14:30	Main duties of an enumerator, how to approach people, how to conduct an interview, consent form		EE
14:30 – 15:00	Practice HH part of questionnaire in pairs		EE
15:00 – 15:15	Coffee/Tea break		
15:15 - 16:15	Child Dietary diversity	Projector, 24h recall print outs	JK
16:15 – 16:45	Child Dietary diversity role play in pairs, presentation of some examples	Question- naire-Guide Powerpoint, Projector	EE
16:45 - 17:00	Wrap up of day – what did we learn? Feedback	Flipchart	JK, EE

Wednesday	Topic	Tools	Responsible
08:30 – 09:30	Briefing of day's agenda, group warm up, clarifying questions on Child dietary diversity		JK
09:30 – 10:00	Completing a questionnaire: what is important	Questionnaire	EE
10:00 – 10:45	Women dietary diversity	Questionnaire, PPT	JK
10:45 – 11:00	Coffee/Tea break		
11:00 – 12:30	Women Dietary diversity continue, role play in pairs, presentation of some examples	Questionnaire, 24h-recall sheets	JK
12:30 – 13:30	Lunch break		
13:30 – 14:30	Group discussion: Finalizing the questionnaire guide for the field	projector, Questionnaire	EE
14:30 – 15:30	Practice questionnaire in pairs	Questionnaire, Tablets	
15:30 – 15:45	Coffee/Tea break		
15:45 – 16:45	Final clarification on questionnaire and other questions	Questionnaires, pens, Flipchart	JK, JA, FK
16:45 – 17:00	Wrap up, Feedback	Flipchart paper Marker	JK, JA, FK
Thursday	Topic	Tools	Responsible
07:30 – 15:00	Pre-Test in Dedza and Salima	Questionnaires, Tablets	JK, EE, BA
Friday	Topic	Tools	Responsible
10:30 – 12:30	Lessons Learned Discussion of experience during the pre-test, follow-up on challenges.		EE
12:30 – 13:30	Lunch break		
13:30 – 15:30	Presentation of adjusted questionnaire, if necessary adjustment of questionnaire guide		
15:30 – 15:45	Coffee/Tea break		
15:45 – 16:30	Overview of logistics for data collection period, payment of allowance for upcoming field days		
Saturday	Topic	Tools	Responsible
9:00 – 09:30	Wrap up, Feedback of the training	pens, Flipchart	EE, JK
9:30 – 10:45	Practice questionnaire in pairs with final field version of the questionnaire	Questionnaires, Tablets	EE
10:45 – 11:00	Coffee/Tea break		
11:00 – 12:00	Practice questionnaire in pairs with final field version of the questionnaire	Questionnaires, Tablets	EE

E. Nutrition Baseline Survey Interview Guide - Malawi

The role of an enumerator:

You are responsible for interviewing mothers/caregivers in the villages selected for the NBS. You have to collect and record data as accurately as possible. You should always follow the NBS Enumerator Guideline and NBS Questionnaire Guide. All problems have to be reported to the supervisor or team leader.

Why an enumerator pair?

All interviews for the NBS will be conducted by an enumerator pair. Interviewer 1 will interview the mothers/caregiver while Interviewer 2 will record the answers with the tablet/questionnaire.

How to handle the tablet?

Every day during the period of data collection, a tablet will be handed out to Interviewer 2. At the end of each day, the tablet has to be given back to the team leader. Interviewer 2 will always get the same tablet and it is her/his duty to handle the tablet responsibly and carefully. The tablet should only be switched on shortly before the interview and has to be put on plane mode after the interview. Please turn off the sound of the tablet. The tablet is only to be used to collect data. It is strictly forbidden to use it for any private purposes, to connect it to other electronic devices or to connect it to the internet.

How to prepare for the interview?

Carefully review the questionnaire and be absolutely clear about what you are going to ask during the interview. Make sure you know the reason behind every question. If you are unsure, check the Questionnaire Guide or consult with your supervisor.

Think about what sort of answers you might expect to the questions you will be asking.

Prepare your survey bag with the following supplies:

- 2 pens (blue colour)
- clipboard
- Consent form
- Shorthand notebook
- NBS Enumerator Guideline and NBS Questionnaire Guide
- Tablet
- Your mobile phone and airtime (airtime will be provided)

How to approach the household?

Always begin the interview by introducing yourself, your partner and the NBS to the family: who are you, your names, from where, which project do you work for? Use the first minutes with the family to build rapport. It is important that the family feels comfortable with you and trusts you.

Please clarify:

Whether this family has a mother/female caretaker (15-49 years of age) with a child aged 6 to 23 months.

- Inform the family about the duration: ¾ - 1 hour interview
- Inform the family that no direct benefits will be given.
- Tell the respondent that she has the right of anonymity and that her responses are treated confidentially. Ask politely for cooperation. Use the “Consent Form” as a guideline for this conversation.

How to conduct the interview:

Maintain the confidentiality and privacy of the mother/participant. Try to find somewhere where the mother/caregiver and child can sit comfortably. If there are onlookers around, politely ask them to leave.

Be neutral throughout the interview: never laugh about, compliment or correct an answer. Do not imply that some answers are better than others. Never lead a respondent to a specific answer or assume or anticipate a response.

Speak loudly, clearly and in a respectful manner. Be patient and let the respondent finish.

Do not change the wording or sequence of questions. Ask each question exactly as they are written since even slight variations in wording may affect responses. Don't use English words in the questions, except when necessary such as program/NGO names.

If the respondent remains silent after a particularly question is asked, repeat the question exactly as it is written. Always handle hesitant respondents tactfully. If the respondent is refusing to give an answer to a specific question continue with the next question.

How to use the tablet:

Carefully type the name and identity number of Interviewer 1 and your name and identity number (Interviewer 2) at the beginning of the interview. Once you have confirmed the presence of a mother and a child in the right age group in the household, fill in the required information about the location. Communicate to Interviewer 1 as soon as you are ready. The tablet will guide you from question to question following the questions that Interviewer 1 is asking the mother. Carefully listen to the answers and tick them accordingly.

How to fill in the questionnaire:

If the tablet is not working and you are too far away from your supervisor (back-up tablet) you have to record the responses using the printed questionnaire.

The questionnaire will be filled in line by line by Interviewer 2 while Interviewer 1 conducts the interview. None of the lines is optional!

Write clearly and not too small, use a blue pen. Remember that all numbers should be recorded using the following system:

1 2 3 4 5 6 7 8 9 0

If you made a mistake, correct it clearly!

The questions in the columns have a logical connection with each other. Pay attention while filling them in. Follow the “Skip”.

F. Quality Control Protocol for Interviewer

Interviewer 1: _____

Date: _____

Interviewer 2: _____

Supervisor: _____

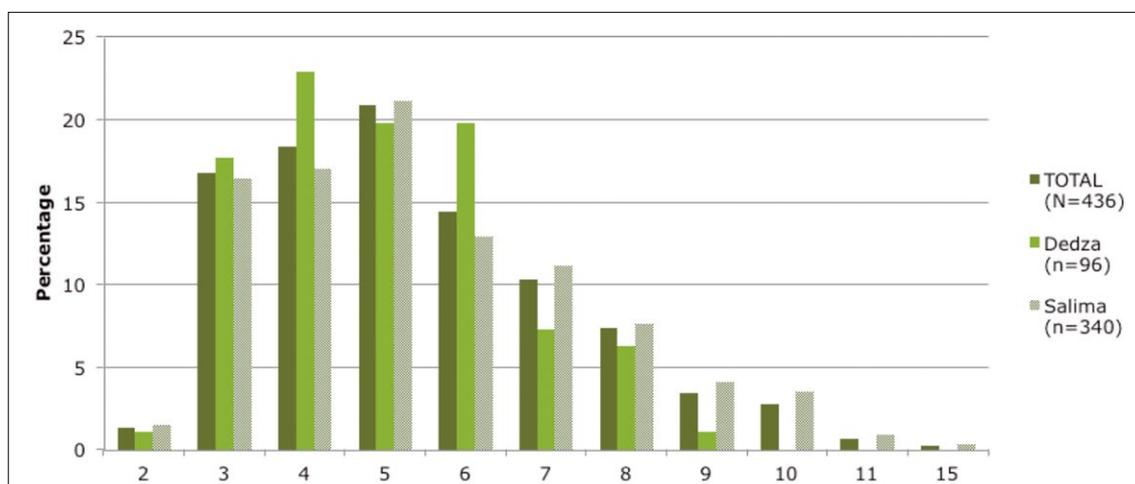
DID INTERVIEWER 1 . . .	YES	NO
Introduce himself/herself and interviewer 2 correctly?		
Informed the respondent about purpose, duration etc. at the beginning of the interview and get permission without coercion?		
Put the cell phone on silent and did not interrupt the interview to take calls?		
Speak clearly during the interview?		
Have neutral facial expressions/body language (did not react positively or negatively to the respondent's answers)?		
Does not start giving instructions to apparently wrong answers or behaviour?		
Refrain from asking leading questions that might have influenced the respondent's answers?		
Read the questions exactly as they were written?		
Repeat the questions exactly as worded when the respondent gave a response that was not very clear? Use probes when the response still was not very clear?		
Write legibly on the questionnaire (24h-recalls!!!)?		
Follow the skip patterns correctly?		
Read responses aloud when he/she was supposed to?		
Prompt the mother for all answers (say "Anything else?") for questions that allow multiple responses especially the 24h-recalls?		
Thank the respondent for the time spent and involvement in the survey?		
Discuss with interviewer 2 the household observations		
DID INTERVIEWER 2...	YES	NO
Put the cell phone on silent and did not interrupt the interview to take calls?		
Communicate that he/she is ready to record the answers at the beginning of the interview		
Thank the respondent for the time spent and involvement in the survey?		
Copy the information from both 24h recalls after the interview		
Discuss with interviewer 1 the household observations		

On a scale of 1 (needs more training) to 10 (excellent), I rate the interviewer's performance during this interview as follows (circle one):

1 2 3 4 5 6 7 8 9 10

Other Comments/Plan of Action for Making Improvements:

G. Distribution of Household size



The following tables show the IDDSs and Food Group Score of women and their children

H. Individual Dietary Diversity Score – Women (IDDS-W)

	Total (N=434)	Dedza	Salima
Mean	3.9	3.4	4.0
Md	4.0	3.0	4.0
SD	1.5	1.4	1.5
Min	0.0	0.0	1.0
Max	9.0	7.0	9.0

I. Food Group Score - Women

Number of food groups	Total (N=434) (%)	Dedza (%)	Salima (%)
0	0.2	1.0	0.0
1	0.7	2.1	0.3
2	14.9	22.9	12.6
3	31.4	35.4	30.3
4	25.0	20.8	26.2
5	13.1	7.3	14.7
6	7.8	2.1	9.4
7	4.6	6.3	4.1
8	1.4	0.0	1.8
9	0.5	0.0	0.6

J. Individual Dietary Diversity Score – all children 6-23 months

	Total (N=436)	Dedza	Salima
Mean	3.2	3.0	3.2
SD	1.3	1.2	1.4
Md	3.0	3.0	3.0
Min	0	0	0
Max	6	6	6

K. Individual Dietary Diversity Score – breastfed children 6-23 months

	Total (N=399)	Dedza	Salima
Mean	3.1	2.9	3.2
SD	1.4	1.2	1.4
Md	3.0	3.0	3.0
Min	0	0	0
Max	6	6	6

L. Individual Dietary Diversity Score – non-breastfed children 6-23 months

	Total (N=37)	Dedza	Salima
Mean	3.4	4.0	3.3
SD	1.0	0.8	1.0
Md	3.0	4.0	3.0
Min	1	3	1
Max	5	5	5

M. Feeding Frequency – children 6-23 months

	Total (N=343)	Dedza	Salima
Mean	3.0	2.8	3.1
SD	1.2	1.3	1.2
Md	3.0	3.0	3.0
Min	0.0	0.0	0.0
Max	9.0	9.0	8.0

N. Individual Dietary Diversity Score – pre- and primary school children

	Total (N=530)	Dedza (n=118)	Salima (n=398)
Mean	3,3	3,0	3,3
SD	1,0	0,8	1,0
Md	3,0	3,0	3,0
Min	1	1	1
Max	7	5	7

O. Individual Dietary Diversity Score – pre-school children (2-5 years)

	Total (N=262)	Dedza (n=63)	Salima (n=199)
Mean	3.3	3.0	3.3
SD	1.0	1.0	1.0
Md	3.0	3.0	3.0
Min	1	2	1
Max	7	5	7

P. Individual Dietary Diversity Score – primary school children (> 6 years)

	Total (N=268)	Dedza (n=57)	Salima (n=211)
Mean	3.3	3.1	3.3
SD	1.0	0.8	1.0
Md	3.0	3.0	3.0
Min	1	2	1
Max	7	5	7

9	Does any member of this household has access to any land that can be used for agriculture?	0= no → Q 11 1= yes	HHLAND	<input type="checkbox"/>
10	Which crops do you grow on the land? Check all that applies		0= no, 1= yes, 88= don't know	
	maize		MAIZE	<input type="checkbox"/>
	cassava		CASSAVA	<input type="checkbox"/>
	irish potatos		POTATO	<input type="checkbox"/>
	groundnuts		GNUTS	<input type="checkbox"/>
	soya		SOYA	<input type="checkbox"/>
	beans		BEANS	<input type="checkbox"/>
	tobacco		TOBACCO	<input type="checkbox"/>
	cotton		COTTON	<input type="checkbox"/>
	sunflowers		SUNFLOW	<input type="checkbox"/>
	other:		GROSPEC	
11	Do you have a home garden?	0= no → Q 14 1= yes	HOMEGAR	<input type="checkbox"/>
12	Do you grow vegetables?	0= no → Q 14 1= yes, but only during the wet-season 2= yes, but only during the dry season 3= yes, year-round	GARVEG	<input type="checkbox"/>
13	Main use of vegetable produced?	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other (specify):	USEVEG	<input type="checkbox"/>
14	Do you have any fruit or fruit trees at your homestead or accessible to you and your family?	0= no → Q 16 1= yes	GARFRUIT	<input type="checkbox"/>
15	Main use of fruits	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other (specify):	USEFRU	<input type="checkbox"/>
16	Does this household own any livestock herds, or farm animals, or poultry, or fishponds?	0= no → Q 18 1= yes	ANIMALS	<input type="checkbox"/>
17	Main use of animal produce?	1= mainly own consumption 2= mainly for sale 3= both (in approx. equal amounts) 99= other (specify):	USEANIM	<input type="checkbox"/>
18	Do you or others in your household participate in programs such as... Check all that applies		0= no, 1= yes	
	school feeding		SCHOOLF	<input type="checkbox"/>
	agricultural development		AGRDEV	<input type="checkbox"/>
	cash transfer		CASHTRA	<input type="checkbox"/>
	food aid		FOODAID	<input type="checkbox"/>
	Other:		SUPPSPEC	
Sanitation and hygiene Information				
19	What is the main source of drinking water for members of your household during the wet/cold season?	1= public tap/standpipe, tubewell / borehole, protected dug well, rainwater collection 2= unprotected spring, unprotected dug well, surface water (river, stream, dam, lake, pond, canal, irrigation channel), bottled water	DRINKWAW	<input type="checkbox"/>
20	What is the main source of drinking water for members of your household during the dry/hot season?	1= public tap/standpipe, tubewell / borehole, protected dug well, rainwater collection 2= unprotected spring, unprotected dug well, surface water (river, stream, dam, lake, pond, canal, irrigation channel), bottled water	DRINKWAD	<input type="checkbox"/>

21	Could you describe how you store water?	1= clean container or jar 2= covered container 3= clean and covered container or jar 88= don't know 99= other	STOREWA	<input type="checkbox"/>
22	Do you treat your water in any way to make it safe to drink?	0= no → Q 23 1= yes 88= don't know	TREATWA1	<input type="checkbox"/>
22a	What do you usually do to the water to make it safer to drink?	1= boil it 2= add bleach/chlorine 3= strain it through a cloth 4= use a water filter (ceramic, sand, composite, etc.) 5= use solar disinfection 6= let it stand and settle 88= don't know 99= other:	TREATWA2	<input type="checkbox"/>
23	What kind of toilet facility do members of your household usually use?	1= pit latrine with slab, composting toilet 2= pit latrine without slab/open pit, bucket, no facilities or bush or field or lake	LATRINE	<input type="checkbox"/>
24	Now I would like to ask you some questions about food. During the last MONTH, was there a time when.....			
a	You were worried you or anyone else in your household would not have enough food to eat because of a lack of money or other resources?	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESA	<input type="checkbox"/>
b	Still thinking about the last MONTH, was there a time when you or anyone else in your household were unable to eat healthy and nutritious food because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESB	<input type="checkbox"/>
c	You or anyone else in your household ate only a few kinds of foods because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESC	<input type="checkbox"/>
d	You or anyone else in your household had to skip a meal because there was not enough money or other resources to get food	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESD	<input type="checkbox"/>
e	Still thinking about the last MONTH, was there a time when you or anyone else in your household ate less than you thought you should because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESE	<input type="checkbox"/>
f	Your household ran out of food because of a lack of money or other resources	0= no 1= yes 88 = don't know 98= refused/no answer	HFIESF	<input type="checkbox"/>
g	You or anyone else in your household were hungry but did not eat because there was not enough money or other resources for food	0= no → Qi 1= yes 88 = don't know → Qi 98= refused/no answer	HFIESG	<input type="checkbox"/>
h	In the last MONTH (=30 days, or 4 weeks), how often did it happen that you or anyone else in your household were hungry but did not eat because there was not enough money or other resources for food? Did this happen only once or twice, in some weeks but not every week, or almost every week? Note: If respondent says this did not happen in the last MONTH, go back to Q7 and code as "No" [code 0].	1= Only once or twice 2= In some weeks but not every week 3= Almost every week 88= Don't Know 98= refused/no answer 0= did not happen	HFIESH	<input type="checkbox"/>
i	In the last MONTH, was there a time when you or anyone else in your household went without eating for a whole day because of a lack of money or other resources?	0= no → Q25 1= yes 88 = don't know → Q25 98= refused/no answer	HFIESI	<input type="checkbox"/>

j	In the last MONTH (=30 days, or 4 weeks) , how often did it happen that you or anyone else in your household went without eating for a whole day because of a lack of money or other resources? Did this happen only once or twice, in some weeks but not every week, or almost every week? <i>Note: If respondent says this did not happen in the last MONTH, go back to Q7 and code as "No" [code 0].</i>	1= Only once or twice 2= In some weeks but not every week 3= Almost every week 88= Don't Know 98= refused/no answer 0= did not happen	HFIESJ	<input type="checkbox"/>
Child Information				
25	Is your child a boy or a girl?	1 = male 2 = female	SEXCHILD	<input type="checkbox"/>
Information on Breastfeeding				
26	Has (name of child) ever been breastfed?	0= no 1= yes 88= don't know	IBFQ10	<input type="checkbox"/>
27	Was (name of the child) breastfed yesterday during day or at night?	0= no 1= yes 88= don't know	IYCFQ7	<input type="checkbox"/>
27a	Did (name of child) consume breast milk in any other way yesterday during the day or at night? e.g. by spoon, cup or bottle; by his/her mother or another woman	0= no 1= yes 88= don't know	IYCFQ7A	<input type="checkbox"/>
Information on childcare				
28	Who is supporting you in taking care of (name of child)?	0= respondent alone 1= mother/mother in law 2= older siblings of child 99= other	CARESUP	<input type="checkbox"/>
29	Who was taking care of (name of child) yesterday?	0= respondent 1= supporter	CAREYES	<input type="checkbox"/>

! Before you continue: Try to find yesterday's caretaker for the 24-h recall!

30a	Now I would like to ask you about some liquids that (name of child) may have had yesterday during the day or night. Did (name of child) have any..... <i>Read each item aloud and record response before proceeding to the next item.</i>	RECORD: 0= no, 1= yes, 88= don't know
	Infant formula?	IYCFQ10B <input type="checkbox"/>
	If yes, how many times	IYCFQ11B <input type="checkbox"/>
	Tinned, powdered, fresh or packed milk?	IYCFQ10C <input type="checkbox"/>
	If yes, how many times	IYCFQ11C <input type="checkbox"/>
	Sour milk, yoghurt?	IYCFQ10F <input type="checkbox"/>
	If yes, how many times	IYCFQ11C <input type="checkbox"/>

Minimum Dietary Diversity Children

30b	Please describe everything that (name of child) ate yesterday during the day or night, whether at home or outside the home. (a) Think about when (name of child) first woke up yesterday. Did (name of child) eat anything at that time? If Yes, please tell me everything (name of child) ate at that time. Probe Anything else? Then continue to question b b) What else did (name of child) eat? Did (name of child) eat anything at that time? If yes, please tell me everything that (name of child) ate at that time. Probe: Anything else?	
After waking up		
Anything else		
Porridge (maize or rice), bread, rice, noodles, sweet beer, spaghetti, or other foods made from grains like sorghum, millet, rice, wheat etc.?	IYCFQ12A	<input type="checkbox"/>
Pumpkin, carrots, or sweet potatoes that are yellow or orange inside	IYCFQ12B	<input type="checkbox"/>
White potatoes, white yams, manioc, cassava or cassava-porridge, or any other foods made from white roots	IYCFQ12C	<input type="checkbox"/>
Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranthus, bean leaves, pumpkin leaves, rape, mustard?	IYCFQ12D	<input type="checkbox"/>
Ripe mangoes, Ripe Paw paws (other local Vitamin-A rich fruits)	IYCFQ12E	<input type="checkbox"/>
Any other fruits or vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green/fresh beans, okra, oranges, lemons, tangerines, bananas	IYCFQ12F	<input type="checkbox"/>
Liver, kidney, heart, blood, or other organ meats	IYCFQ12G	<input type="checkbox"/>
Any meat, such as beef, pork, lamb, goat, chicken, mice, rats, rabbits, ducks, guinea fowls?	IYCFQ12H	<input type="checkbox"/>
Eggs from any kind of birds	IYCFQ12I	<input type="checkbox"/>
Fresh or dried fish, shellfish, or seafood	IYCFQ12J	<input type="checkbox"/>
Any foods made from beans, ground beans, peas, lentils, soya, groundnuts, tree nuts, or seeds	IYCFQ12K	<input type="checkbox"/>
Milk, cheese, yoghurt, sour milk or other milk products	IYCFQ12L	<input type="checkbox"/>
Any fat, oil or butter or foods made with any of these?	IYCFQ12M	<input type="checkbox"/>
Any sugary foods such as chocolates, sugar, honey, sweets, candies, cakes, or biscuits, soda, fanta, cocacola etc.	IYCFQ12N	<input type="checkbox"/>
Condiments for flavor, such as chilies, pepper, ginger, spices, herbs, or fish powder, salt	IYCFQ12O	<input type="checkbox"/>
Grubs, snails, or insects	IYCFQ12P	<input type="checkbox"/>

30c	Did (name of child) receive anything to eat/any kind of food yesterday?	0= no → Q 32 1= yes 88= don't know → Q 32	IYCFQ13	<input type="checkbox"/>
31	How many times did (name of child) receive food including meals and snacks yesterday?	Record number of times 88= don't know	IYCFQ14	<input type="checkbox"/>
Feeding Habits				
32	Was (name of child)'s intake of food yesterday different from usual	0= no 1= yes 88= don't know	CFUSUAL	<input type="checkbox"/>
33	How old was (name of child) when you first gave other food apart from breast milk?	Record age in months 88= don't know 77= does not yet take food	CFAGE	<input type="checkbox"/>
34	Please look at this picture of porridges: Which one would you give to a young child?	1= shows thick porridge 2= shows watery porridge 88= don't know	CONSIST	<input type="checkbox"/>
34	Please tell me some ways to make porridge more nutritious or better for your baby's health. <i>Probe if necessary:</i> Which foods or types of food can be added to rice porridge make it more nutritious? Do not read the answers, Check all that applies		0= no, 1= yes,	
	Animal-source foods (meat, poultry, fish, liver/organ meat, eggs, etc.)		ADANIM	<input type="checkbox"/>
	Pulses and nuts: flours of groundnut and other legumes (peas, beans, lentils, etc.), sunflower seed, peanuts, soybeans		ADPULS	<input type="checkbox"/>
	Orange (vitamin A rich) fruits and vegetables (carrot, orange-fleshed sweet potato, yellow pumpkin, mango, papaya, etc.)		ADVITA	<input type="checkbox"/>
	Green leafy vegetables (e.g. spinach)		ADLVEG	<input type="checkbox"/>
	Energy-rich foods (e.g. oil, butter, margarine)		ADFAT	<input type="checkbox"/>
35	When (name of child) is sick, is he/she given less than usual, about the same amount, more than usual or nothing to drink (including breast milk)? <i>If less, PROBE: Was he/she given much less than usual to drink or somewhat less?</i>	1= much less 2= somewhat less 3= about the same 4= more 5= nothing 6= child never been sick 88= don't know	ILLDRINK	<input type="checkbox"/>
36	When (name of child) is sick, is he/she given less than usual, about the same amount, more than usual or nothing to eat? <i>If less, PROBE: Was he/she given much less than usual to eat or somewhat less?</i>	1= much less 2= somewhat less 3= about the same 4= more 5= nothing, stopped food 6= child never been sick 7= does not yet take food 88= don't know	ILLEAT	<input type="checkbox"/>
37	Has (name of child) had diarrhea in the past two weeks?	0= no 1= yes 88= don't know	CHDIAR	<input type="checkbox"/>
38	Since (name of child) was born, how many times did he/she suffer from diarrhea?	Record number of diarrhea episodes	FREQDIA	<input type="checkbox"/>
39	How can you recognize that someone is not having enough food? <i>Probe if necessary:</i> What are the signs of undernutrition? Do not read the answers, Check all that applies		0= no, 1= yes,	
	Lack of energy/weakness: cannot work, study or play as normal (disability)		RECMAL1	<input type="checkbox"/>
	Weakness of the immune system (becomes ill easily or becomes seriously ill)		RECMAL2	<input type="checkbox"/>
	Loss of weight/thinness		RECMAL3	<input type="checkbox"/>
	Children do not grow as they should (growth faltering)		RECMAL4	<input type="checkbox"/>

	Washing hands before eating		WBEFEAT	<input type="checkbox"/>
	Washing body, hair, clothes, dishes and pots, cleaning the house		WBODY	<input type="checkbox"/>
47b	Please describe step by step how you wash your hands <i>Note: do not read out the answers</i>	1= washes hands in a bowl of water (sharing with other people) – poor practice	HANDWA1	<input type="checkbox"/>
		2= with someone pouring a little clean water from a jug onto one's hands – appropriate practice 3= under running water – appropriate practice 4= washes hands with soap or ashes	HANDWA2	<input type="checkbox"/>
48	Food poisoning often results from contact with germs from faeces. What can you do to avoid sickness from germs from human or animal faeces?		0= no 1= yes	
	Wash hands (after going to the toilet and cleaning the baby's bottom)		PRVDIA1	<input type="checkbox"/>
	Remove faeces from the home and surroundings (use a latrine, teach small children to use a potty and put children's faeces in the latrine, and clean up faeces from animals)		PRVDIA2	<input type="checkbox"/>
	Cover food to protect it from flies		PRVDIA3	<input type="checkbox"/>
	Wash fruit and vegetables before preparation		PRVDIA4	<input type="checkbox"/>
49	Did you ever receive any hygiene counseling?	0= no 1= yes 88= don't know	HWOUN	<input type="checkbox"/>

Minimum Dietary Diversity - Women

50	Please describe everything that you ate yesterday during the day or night, whether at home or outside the home. (a) Think about when you first woke up yesterday. Did you eat anything at that time? If Yes, please tell me everything <i>Then continue to question b</i> b) What else did you eat? Go from possible meal to meal and complete the list Anything else?	
After waking up		
Anything else		
Nsima, porridge, fritters, bread/buns, rice, noodles, sweet beer or super shake/maheu, spaghetti, or other foods made from grains like sorghum, millet, rice, wheat, oats, corn-flakes?		IWDDSA <input type="checkbox"/>
White (sweet) potatoes, white yams, cassava (nsima, porridge or chips), green unripe banana or any other foods made from roots		IWDDSB <input type="checkbox"/>
Any foods made from mature beans or peas (fresh or dried), bambara nuts, lentils, soya, cowpeas, velvet beans, or products like soya pieces, soya mince, soya sausage		IWDDSC <input type="checkbox"/>
Any foods made from groundnuts (groundnut flower) sweet-mbalala, peanutbutter, tree-nuts, pumpkin seeds, sunflower seeds, cashew nuts or seeds including nut/seed butters		IWDDSD <input type="checkbox"/>
Milk (fresh or powder), cheese, yoghurt or other milk products (ice cream)		IWDDSE <input type="checkbox"/>
Liver, kidney, heart, blood-based foods, or other organ meats (including from wild game)		IWDDSF <input type="checkbox"/>
Any meat, such as beef, pork, lamb, mutton, goat, chicken, mice, rabbits, guinea pig, ducks, guinea fowls, small birds or wild game meat?		IWDDSG <input type="checkbox"/>
Fresh or dried fish, shellfish, or seafood, kapenta		IWDDSH <input type="checkbox"/>
Eggs from any kind of birds		IWDDSI <input type="checkbox"/>
Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranthus, bean leaves, pumpkin leaves, rape, mustard?		IWDDSJ <input type="checkbox"/>
Pumpkin, butternut, squash, carrots, or sweet potatoes that are yellow or orange inside,		IWDDSK <input type="checkbox"/>
Ripe mangoes, Ripe Paw paws, Granadilla		IWDDSL <input type="checkbox"/>
Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, cucumber, thorny cucumber, okra, mushrooms		IWDDSM <input type="checkbox"/>
Any other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh, guava, custard apple, Mexican apple, watermelon, baobab, green mango, green pawpaw, grapes, strawberry, other wild fruits: masuku, mpundu, nthuza		IWDDSN <input type="checkbox"/>
Insects (termites, grasshoppers, crickets), crubs, insect eggs, land and sea snails		IWDDSO <input type="checkbox"/>
Oil, fats or butter added to food or used for cooking, including extracted oils from nuts, fruits and seeds, and all animal fat		IWDDSP <input type="checkbox"/>
Crisps and chips, fried potatoes, fried dough (doughnuts, mandazi), other fried snacks,		IWDDSQ <input type="checkbox"/>
Any sugary foods such as chocolates, sugar, honey, sweets, candies, cakes, or biscuits, jam		IWDDSR <input type="checkbox"/>
Sweetened fruit juice or juice-drinks, soft drinks/fizzy drinks like, fanta, cocacola, sprite, chocolat drinks, tea or coffee with sugar		IWDDSS <input type="checkbox"/>
Ingredients used in small amounts for flavor, such as chilies, pepper, ginger, spices, herbs, or fish powder, salt, tomato paste, flavor cubs		IWDDST <input type="checkbox"/>

51	Dietary diversity of children 2-5 years		
	bread, rice, noodles, sweet beer, spaghetti, or other foods made from grains like sorghum, millet, rice, wheat etc? and/or: White potatoes, white yams, manioc, cassava, or any other foods made from roots	IDDS1CH1	☐☐
	Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranthus, bean leaves, pumpkin leaves, rape, mustard?	IDDS2CH1	☐☐
	Any pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside and/or: Ripe mangos, Ripe Paw paws	IDDS3CH1	☐☐
	Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green beans, okra and/or: other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh	IDDS4CH1	☐☐
	Any Liver, kidney, heart, blood-based foods, or other organ meats (including from wild game)	IDDS5CH1	☐☐
	Any meat, such as beef, pork, lamb, goat, chicken, mice, rats, rabbits, ducks, guinea fowls or wild game meat? and/or: Fresh or dried fish, shellfish, or seafood	IDDS6CH1	☐☐
	Any eggs from any kind of birds	IDDS7CH1	☐☐
	Any foods made from mature beans or peas (fresh or dried), ground beans, lentils, soya, or products like hummus, tofu, tempeh and/or: foods made from groundnuts (groundnut flower), tree-nuts, or seeds including nut/seed butters	IDDS8CH1	☐☐
	Any milk, cheese, yoghurt or other milk products	IDDS9CH1	☐☐
51	Dietary diversity of primary school children (6 and above)		
	bread, rice, noodles, sweet beer, spaghetti, or other foods made from grains like sorghum, millet, rice, wheat etc? and/or: White potatoes, white yams, manioc, cassava, or any other foods made from roots	IDDS1CH2	☐☐
	Any dark green leafy vegetables including wild green vegetables like cassava leaves, amaranthus, bean leaves, pumpkin leaves, rape, mustard?	IDDS2CH2	☐☐
	Any pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside and/or: Ripe mangos, Ripe Paw paws	IDDS3CH2	☐☐
	Any other vegetables like cabbage, eggplants, tomatoes, onions, green pepper, green beans, okra and/or: other fruit like oranges, lemons, tangerines, bananas, avocado, coconut flesh	IDDS4CH2	☐☐
	Any Liver, kidney, heart, blood-based foods, or other organ meats (including from wild game)	IDDS5CH2	☐☐
	Any meat, such as beef, pork, lamb, goat, chicken, mice, rats, rabbits, ducks, guinea fowls or wild game meat? and/or: Fresh or dried fish, shellfish, or seafood	IDDS6CH2	☐☐
	Any eggs from any kind of birds	IDDS7CH2	☐☐
	Any foods made from mature beans or peas (fresh or dried), ground beans, lentils, soya, or products like hummus, tofu, tempeh and/or: foods made from groundnuts (groundnut flower), tree-nuts, or seeds including nut/seed butters	IDDS8CH2	☐☐
	Any milk, cheese, yoghurt or other milk products	IDDS9CH2	☐☐

Thank the mother for her time and cooperation.

R. Results disaggregated by TAs

The following table presents the answers to the questions following the questionnaire. The answers are disaggregated by the four TAs, Chauma, Ndindi, Maganga and Pemba.

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
Demographic data					
1	Age of child				
	Mean	14.0	13.5	14.6	14.1
	SD	4.9	5.0	5.0	4.9
	Md	14.0	13.0	14.0	14.5
	Min	6.0	5.0	5.0	5.0
	Max	23.0	23.0	23.0	23.0
2	What is your marital status?				
	married monogamous	65.6	66.1	66.4	60.9
	married polygamous	17.7	15.3	12.5	21.9
	widowed		0.8	2.0	
	divorced or seperated	9.4	11.3	8.6	7.8
	single	7.3	6.5	10.5	9.4
3	What is the sex of the household head?				
	male	80.2	82.3	80.3	78.1
	female	19.8	17.7	19.7	21.9
4	What is your ethnicity?				
	Chewa	81.3	62.1	49.3	65.6
	Yao	17.7	26.6	38.2	21.9
	Ngoni	1.0	4.8	5.3	9.4
	Lomwe	0.0	4.0	2.0	1.6
	Tonga	0.0	0.8	3.3	0.0
	Tumbuka	0.0	0.8	1.3	0.0
	Other	0.0	0.8	0.7	1.6
5	Why did you settle here?				
	born in the area	71.9	72.6	57.2	76.6
	moved here by marriage	22.9	20.2	21.7	18.8
	wanted better livelihood (fertile land/ business opportunity)	2.1	4.8	21.1	3.1
	got land assigned in the area	3.1	2.4		1.6
5	How many people live <i>permanently</i> in your household?				
		(n=92)	(n=121)	(n=145)	(n=63)
	Mean	4.96	5.21	5.77	5.33
	Md	5.00	5.00	6.00	5.00
	sd	1.540	1.928	2.118	2.200
	Min	2	2	2	2
	Max	9	10	15	11
6a	Do you have a child 2-5 years?				
	no	34.4	38.7	41.4	43.8
	yes	65.6	61.3	58.6	56.3
6b	Do you have a child 6 years and older in primary school?				
	no	40.6	46.8	28.3	39.1
	yes	59.4	53.2	71.7	60.9

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
7	What is the highest level of school you attended: primary, secondary, or higher?				
7a	What is the highest class you completed at that level?				
	No education	12.5	15.3	12.5	10.9
	Some primary	64.6	65.3	67.8	75.0
	Completed primary	10.4	8.9	7.3	7.8
	Some secondary	5.2	6.5	9.2	4.7
	Completed secondary	5.2	4.0	2.6	1.6
	College or higher	1.0	0.0	0.7	0.0
	doesn't know	1.0	0.0	0.0	0.0
8	What are the sources of income of your household throughout the year?				
	Sale of crops				
	no	26.0	54.0	71.7	35.9
	yes	71.9	46.0	28.3	64.1
	don't know	2.1	0.0	0.0	0.0
	Sale of animal products				
	no	89.6	97.6	98.0	95.3
	yes	6.3	1.6	2.0	3.1
	don't know	4.2	0.0	0.0	1.6
	missing	0.0	0.8	0.0	0.0
	Sale of goods/crafts				
	no	87.5	78.2	84.2	89.1
	yes	8.3	21.0	15.8	9.4
	don't know	4.2	0.0	0.0	1.6
	missing	0.0	0.8	0.0	0.0
	Temporary Salary				
	no	40.6	48.4	50.7	57.8
	yes	58.3	50.8	47.4	40.6
	don't know	1.0	0.8	0.0	0.0
	missing	0.0	0.0	0.0	1.6
	Pretty trade/ small business				
	no	65.6	52.4	44.1	39.1
	yes	30.2	46.8	55.9	59.4
	don't know	4.2		0.0	1.6
	missing	0.0	0.8	0.0	0.0
	Regular salary				
	no	95.8	92.7	88.8	95.3
	yes	0.0	6.5	11.2	3.1
	don't know	4.2		0.0	1.6
	missing	0.0	0.8	0.0	0.0
	Remittance from relatives/husband				
	no	95.8	95.2	95.4	85.9
	yes	0.0	4.0	4.6	12.5
	don't know	4.2		0.0	1.6
	missing	0.0	0.8	0.0	0.0
	Income generated by sale or exchange of public transfer				
	no	95.8	99.2	100.0	98.4
	yes	0.0	0.0	0.0	
	don't know	4.2	0.0	0.0	1.6
	missing	0.0	0.8	0.0	0.0

	Dedza	Salima		
	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
None (subsistence farming only)				
no	95.8	98.4	100.0	98.4
yes	0.0	0.8	0.0	0.0
don't know	4.2	0.0	0.0	1.6
missing	0.0	0.8	0.0	0.0
9 Does any member of this household has access to any land that can be used for agriculture?				
no	0	4.8	19.1	0
yes	100.0	95.2	80.9	100.0
10 Which crops do you grow on the land?				
Maize				
no	1.0	6.5	19.1	100.0
yes	99.0	93.5	80.9	0.0
Irish Potato				
no	91.7	95.2	98.7	100.0
yes	1.0	0.8	0.7	0.0
don't know	6.3	2.4	0.0	0.0
missing	1.0	1.6	0.7	0.0
Cassava				
no	90.6	94.4	78.3	96.9
yes	2.1	2.4	21.1	3.1
don't know	6.3	2.4	0.0	0.0
missing	1.0	0.8	0.7	0.0
Rice				
no	100.0	85.5	72.4	0.0
yes	0.0	14.5	27.6	0.0
Sorghum				
no	97.9	97.6	98.7	100.0
yes	2.1	2.4	1.3	0.0
Millet				
no	100.0	99.2	100.0	100.0
yes	0.0	0.8	0.0	0.0
Sweet potato				
no	96.9	93.5	98.7	90.6
yes	3.1	6.5	1.3	9.4
Groundnuts				
no	32.3	46.8	70.4	85.9
yes	64.6	51.6	28.9	14.1
don't know	2.1	0.8	0.0	0.0
missing	1.0	0.8	0.7	0.0
Soya				
no	28.1	94.4	94.1	96.9
yes	71.9	2.4	5.3	3.1
don't know	0.0	2.4	0.0	0.0
missing	0.0	0.8	0.7	0.0
Beans				
no	50.0	91.1	96.7	92.2
yes	44.8	4.8	2.6	7.8
don't know	4.2	2.4	0.0	0.0
missing	1.0	1.6	0.7	0.0

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
	Cowpeas				
	no	100.0	83.9	92.1	60.9
	yes	0.0	16.1	7.9	39.1
	Pigon peas				
	no	100.0	96.8	99.3	100.0
	yes	0.0	3.2	0.7	0.0
	Sunflower				
	no	92.7	96.8	98.7	100.0
	yes	0.0	0.0	0.7	0.0
	don't know	5.2	2.4	0.0	0.0
	missing	2.1	0.8	0.7	0.0
	Pumking leaves				
	no	99.0	86.3	92.1	96.9
	yes	1.0	13.7	7.9	3.1
	Tabacco				
	no	91.7	91.9	98.0	100
	yes	3.1	4.8	0.7	0.0
	don't know	5.2	2.4	1.3	0.0
	missing	0.0	0.8	0.0	0.0
	Cotton				
	no	93.8	73.4	92.8	92.2
	yes	0.0	23.4	6.6	6.3
	don't know	5.2	2.4	0.0	0.0
	missing	1.0	0.8	0.7	1.6
11	Do you have a home garden?				
	no	54.2	80.6	66.4	73.4
	yes	45.8	19.4	33.6	26.6
12	If yes, do you grow vegetables?				
	no	5.2	3.2	11.2	6.3
	yes, during the wet-season	6.3	2.4	5.9	4.7
	yes, during the dry-season	21.9	10.5	7.2	9.4
	yes, year-round	12.5	3.2	9.2	6.3
13	If yes, main use of vegetable produced? (If household grows vegetables)				
	mainly own consumption	14.6	4.0	11.2	3.1
	mainly for sale	0.0	0.0	0.0	1.6
	both (in approx. equal amounts)	26.0	12.1	11.2	15.6
14	Do you have any fruit or fruit trees at your homestead or accessible to you and your family?				
	If yes: Main use of fruits				
	no	50.0	31.5	34.9	50.0
15	yes, mainly own consumption	35.4	54.8	41.4	35.9
	yes, mainly for sale	0.0	0.0	0.7	1.6
	yes, both (in approx. equal amounts)	14.6	13.7	22.4	12.5

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
16	Does this household own any livestock herds, or farm animals, or poultry, or fishponds? If yes: Main use of animal produce?				
	no	59.4	55.6	55.9	54.7
17	yes, mainly own consumption	5.2	1.6	3.9	1.6
	yes, mainly for sale	8.3	7.3	9.2	15.6
	yes, both (in approx. equal amounts)	25.0	35.5	30.3	28.1
	other	2.1	0.0	0.7	0.0
18	Do you or others in your household participate in programs such as....				
	...schoolfeeding				
	no	93.8	79.0	83.6	82.8
	yes	6.3	21.0	16.4	17.2
	...agricultural development				
	no	79.2	74.2	78.9	78.1
	yes	20.8	25.8	21.1	21.9
	...cash transfer				
	no	94.8	85.5	98.0	92.2
	yes	5.2	14.5	2.0	7.8
	...food aid				
	no	85.4	78.2	98.7	100.0
	yes	14.6	21.8	1.3	0.0
19	What is the main source of drinking water for members of your household during the wet/cold season?				
	improved	75.0	88.7	94.1	96.9
	unimproved	25.0	10.5	5.9	3.1
20	What is the main source of drinking water for members of your household during the dry/hot season?				
	improved	71.9	91.9	91.4	98.4
	unimproved	28.1	8.1	8.6	1.6
21	Could you describe how you store water?				
	clean container/jar	15.6	10.5	7.9	1.6
	covered container/jar	39.6	41.1	35.5	48.4
	clean and covered container/jar	44.8	47.6	55.9	50.0
22	Do you treat your water in any way to make it safe to drink?				
	no	66.7	54.0	46.7	45.3
	yes	33.3	46.0	53.3	54.7
22a	What do you usually do to the water to make it safer to drink?				
	boil it	17.7	6.5	7.2	3.1
	adding bleach/chlorine	11.5	37.9	44.1	46.9
	strain it through a cloth	3.1	0.8	2.0	4.7
	other	1.0	0.8	0.0	0.0
23	What kind of toilet facility do members of your household usually use?				
	improved	26.0	10.5	24.3	0.0
	unimproved	74.0	89.5	75.7	100.0

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
24	Household Food Insecurity Severity Experience -Scale (reference period - last four weeks/last month)				
	Food secure	2.1	0.8	3.3	6.3
	Mild food insecure	6.3	10.5	11.2	7.8
	Moderate food insecure	25.0	25.0	25.7	35.9
	Severe food insecure	66.7	62.9	58.6	50.0
25	Is your child a boy or a girl?				
	male	46.9	49.2	51.3	48.4
	female	53.1	50.8	48.7	51.6
26	Has (name of child) ever been breastfed?				
	yes	0.0	0.8	2.0	0.0
	no	100.0	99.2	98.0	100.0
27	Was (name of the child) breastfed yesterday during day or at night?				
	no	4.2	8.9	12.5	4.7
	yes	95.8	91.1	87.5	95.3
27a	Did (name of child) consume breast milk in any other way yesterday during the day or at night? e.g. by spoon, cup or bottle; by his/her mother or another woman				
	no	97.9	99.2	99.3	96.9
	yes	1.0	0.8	0.7	3.1
	don't know	1.0	0.0	0.0	0.0
28	Who is supporting you in taking care of (name of child)?				
	respondent alone	87.5	83.1	81.6	85.9
	mother/mother in law of respondent	10.4	12.9	10.5	12.5
	older siblings of the child	2.1	1.6	3.3	1.6
	other	0.0	2.4	4.6	0.0
29	Who was taking care of (name of child) yesterday?				
	respondent	94.8	92.7	90.8	95.3
	supporter	5.2	7.3	9.2	4.7
30-31	Yesterday, the <i>breastfed</i>child ate...				
	...grains, toots, tubers				
	no	2.1	2.4	2.0	0.0
	yes	97.9	97.6	98.0	100.0
	...pulses and nuts				
	no	61.5	53.2	54.6	56.3
	yes	38.5	46.0	45.4	43.8
	...dairy products				
	no	94.8	91.1	88.2	89.1
	yes	5.2	8.1	11.8	10.9
	...flesh foods				
	no	89.6	76.6	62.5	60.9
	yes	10.4	22.6	37.5	39.1
	...eggs				
	no	96.9	91.9	94.1	93.8
	yes	3.1	6.5	4.6	6.3

	Dedza	Salima		
	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
...vitamin A-rich foods and vegetables				
no	34.4	37.1	32.9	40.6
yes	65.6	62.9	67.1	59.4
...other fruits and vegetables				
no	25.0	37.1	25.0	39.1
yes	75.0	62.1	75.0	60.9
Individual Dietary diversity Score (IDDS) - breastfed child				
Mean	2.9	3.0	3.4	3.2
Md	1.2	1.4	1.4	1.5
sd	3.0	3.0	4.0	3.0
Min	0.0	0.0	0.0	1.0
Max	6.0	6.0	6.0	6.0

Yesterday, the non-breastfed child ate...				
...grains, toots, tubers				
breastfed child	95.8	90.3	87.5	95.3
no	0.0	0.0	0.0	0.0
yes	4.2	8.9	12.5	4.7
...pulses and nuts				
breastfed child	95.8	90.3	87.5	95.3
no	0.0	5.6	6.6	3.125
yes	4.2	3.2	5.9	1.6
...flesh foods				
breastfed child	95.8	91.1	87.5	95.3
no	3.1	7.3	6.6	1.6
yes	1.0	0.8	5.9	3.1
...eggs				
breastfed child	95.8	90.3	86.8	95.3
no	4.2	7.3	11.8	4.7
yes	0.0	0.8	0.0	0.0
...vitamin A-rich foods and vegetables				
breastfed child	95.8	90.3	87.5	95.3
no	1.0	0.8	3.3	3.1
yes	3.1	8.1	9.2	1.6
...other fruits and vegetables				
breastfed child	95.8	90.3	87.5	95.3
no	0.0	3.2	2.6	3.1
yes	4.2	5.6	9.9	1.6
Individual Dietary diversity Score (IDDS) - non-breastfed child				
Mean	4.0	3.1	3.5	2.7
Md	0.8	1.1	1.0	0.6
sd	4.0	3.0	4.0	3.0
Min	3.0	1.0	2.0	2.0
Max	5.0	5.0	5.0	3.0

	Dedza	Salima		
	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
Minimum Dietary Diversity - MDD - breastfed and non-breastfed				
no	69.8	62.1	44.7	57.8
yes	30.2	37.9	55.3	42.2
Minimum Meal Frequency - MMF - breastfed child				
no	41.3	28.3	23.3	18.0
yes	58.7	71.7	76.7	78.7
real missing	0	0.0	0.0	3.3
Minimum Meal Frequency - MMF - non-breastfed child				
no	25.0	54.5	42.1	100.0
yes	75.0	45.5	57.9	0.0
Minimum Acceptable Diet - MAD for breastfed children				
no	76.1	67.3	53.4	55.7
yes	23.9	32.7	46.6	41.0
missing	0.0	0.0	0.0	3.3
Minimum Acceptable Diet - MAD for non-breastfed children				
no	100.0	100.0	100.0	100.0
yes	0	0	0	0
32	Was (name of child)'s intake of food yesterday different from usual			
no	66.7	58.1	49.3	50.0
yes	33.3	41.1	50.0	50.0
don't know	0.0	0.8	0.7	0.0
33	How old was (name of child) when you first gave other food apart from breast milk?			
1	0.0	0.0	0.7	1.6
2	0.0	0.8	3.3	
3	0.0	1.6	3.9	1.6
4	3.1	3.2	5.3	4.7
5	3.1	8.1	7.2	9.4
6	82.3	71.8	67.8	65.6
7	4.2	9.7	6.6	9.4
8	1.0	1.6	2.6	4.7
9	1.0	0.8	0.7	1.6
10	1.0	0.8	0.7	0.0
11	0.0	0.0	0.0	0.0
12	1.0	0.8	0.7	1.6
don't know	3.1	0.0	0.7	0.0
Child does not yet take food	0.8	0.0	0.0	0.0
	n=96	n=124	n=152	n=62
Mean	2.8	2.9	3.3	3.1
SD	1.3	1.1	1.2	1.1
Md	3.0	3.0	3.0	3.0
Min	0.0	0.0	0.0	1.0
Max	9.0	6.0	8.0	6.0

		Dedza	Salima		
		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
34	Please look at this picture of porridges: Which one would you give to a young child?				
	thick porridge	28.1	38.7	43.4	34.4
	watery porridge	71.9	61.3	56.6	65.6
34a	Please tell me some ways to make porridge more nutritious or better for your baby's health.				
	...adding animal sourced foods				
	no	65.6	55.6	65.8	64.1
	yes	34.4	44.4	34.2	35.9
	...adding pulses and nuts				
	no	13.5	9.7	7.2	10.9
	yes	86.5	90.3	92.8	89.1
	...adding vitamin A-rich fruits and vegetables				
	no	95.8	95.2	96.1	96.9
	yes	4.2	4.8	3.9	3.1
	..adding green leafy vegetables				
	no	88.5	80.6	91.4	84.4
	yes	11.5	19.4	8.6	15.6
	...adding oil/fat				
	no	72.9	66.1	72.4	85.9
	yes	27.1	33.9	27.6	14.1
	Knowledge Score – Enriching porridge				
	Mean	1.5	1.8	1.6	1.5
	Md	1.0	2.0	2.0	1.0
	Sd	1.0	1.0	0.9	0.9
	Min	0	0	0	0
	Max	4	4	4	4
35	When (name of child) is sick, is he/she given less than usual, about the same amount, more than usual or nothing to drink (including breast milk)?				
	much less	10.4	7.3	3.3	0.0
	somewhat less	38.5	39.5	42.1	48.4
	about the same	36.5	33.9	41.4	37.5
	more	12.5	16.1	11.8	14.1
	nothing	1.0	2.4	0.7	0.0
	child has never been sick	1.0	0.0	0.7	0.0
36	When (name of child) is sick, is he/she given less than usual, about the same amount, more than usual or nothing to eat?				
	much less	9.4	8.1	4.6	7.8
	somewhat less	59.4	63.7	53.3	65.6
	about the same	24.0	21.0	35.5	21.9
	more	2.1	4.8	4.6	1.6
	nothing	3.1	1.6	0.0	3.1
	child has never been sick	1.0	0.0	0.7	0.0
	don't know	1.0	0.0	0.0	0.0
	child does not yet take food	0.0	0.8	1.3	0.0

	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
Disease/ill and not eating food				
no	65.6	59.7	68.4	56.3
yes	34.4	40.3	31.6	43.8
Knowledge Score – Reasons for Malnutrition				
Mean	1.4	1.4	1.3	1.3
Md	1.0	1.0	1.0	1.0
Sd	0.7	0.6	0.6	0.6
Min	0	0	0	0
Max	3	3	3	3
41 What should we do to prevent malnutrition among young children (6–23 months)				
Give more food				
no	53.1	43.5	42.1	35.9
yes	46.9	56.5	57.9	64.1
Give different types of food each day				
no	60.4	60.5	55.9	67.2
yes	39.6	39.5	44.1	32.8
Feed frequently				
no	59.4	58.9	61.2	62.5
yes	40.6	41.1	38.8	37.5
Give attention during meals				
no	92.7	97.6	94.7	90.6
yes	7.3	2.4	5.3	9.4
Go to the health centre/hospital and check that the child is growing				
no	95.8	94.4	94.7	93.8
yes	4.2	5.6	5.3	6.3
Knowledge Score – Prevention of Malnutrition				
Mean	1.3	1.4	1.5	1.4
Md	1.0	1.0	1.0	1.0
Sd	0.8	0.8	0.9	0.8
Min	0	0	0	0
Max	4	3	4	4
42 Do you have a counseling structure for nutrition in your village?				
no	86.5	77.4	90.1	85.9
health surveillance assistant (HSA)	10.4	14.5	8.6	6.3
volunteer group	2.1	4.0	1.3	4.7
agricultural extension service	0.0	0.8	0.0	0.0
other	1.0	3.2	0.0	0.0
43 Do you receive any nutrition counseling?				
no counseling received	53.1	45.2	52.6	62.5
health surveillance assistant (HSA)	42.7	50.8	44.1	31.3
volunteer group	1.0	2.4	2.0	3.1
agricultural extension service	0.0	0.8	1.3	3.1
other	3.1	0.8	0.0	0.0
	Dedza	Salima		

		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
44	What is your age in years?				
		n=92	n=119	n=150	n=63
	Mean	27.2	27.6	28.1	26.1
	SD	6.2	6.8	7.1	6.6
	Md	26.0	26.0	27.0	24.0
	Min	18.0	18.0	17.0	15.0
	Max	45.0	46.0	45.0	41.0
45	How many times did you receive antenatal care during the pregnancy with (name of child)?				
		n=92	n=117	n=150	n=64
	Mean	3.89	3.99	3.98	3.81
	Md	4.00	3.00	4.00	4.00
	sd	1.719	1.873	1.287	1.207
	Min	0	1	1	1
	Max	9	10	9	8
46	How many times did you go to under 5 clinic with (name of child)?				
		n=91	n=117	n=142	n=57
	Mean	11.41	9.94	11.06	10.91
	Md	11.00	9.00	11.00	11.00
	sd	4.849	4.843	4.689	5.549
	Min	3	1	3	1
	Max	23	22	23	20
47	Does your HH have soap (or washing powder/ liquid) at present?				
	no	57.3	59.7	49.3	57.8
	yes	42.7	40.3	50.7	42.2
47a	When you used soap the last time, what did you use it for?				
	Washing my children's hands				
	no	96.9	97.6	88.8	87.5
	yes	3.1	2.4	10.5	12.5
	Washing hands after defecating				
	no	87.5	79.0	81.6	71.9
	yes	12.5	21.0	17.8	28.1
	Washing hands after cleaning child				
	no	93.8	96.0	94.1	89.1
	yes	6.3	4.0	4.6	10.9
	Washing hands before feeding child				
	no	100.0	97.6	97.4	96.9
	yes	0	1.6	1.3	3.1
	Washing hands before preparing food				
	no	100	99.2	98.7	98.4
	yes	0	0.8	0.7	1.6
	Washing hands before eating				
	no	99.0	96.0	96.7	96.9
	yes	1.0	4.0	2.0	3.1
	Washing body, hair, clothes, dishes and pots, cleaning the house				
	no	0	0	.7	1.6
	yes	100.0	100.0	98.7	98.4
		Dedza		Salima	

		Chauma	Ndindi	Maganga	Pemba
		n=96	n=124	n=152	n=64
47b	Please describe step by step how you wash your hands				
	washes hands in a bowl of water (sharing with other people)				
	no	49.0	45.2	53.9	43.8
	yes	51.0	54.8	46.1	56.3
	with someone pouring a little clean water from a jug onto one's hands				
	no	47.9	51.6	46.7	56.3
	yes	52.1	48.4	53.3	43.8
	under running water				
	no	96.9	91.9	96.1	95.3
	yes	3.1	8.1	3.9	4.7
	washes hands with soap or ashes				
	no	89.6	88.7	89.5	79.7
	yes	10.4	11.3	10.5	20.3
48	What can you do to avoid sickness from germs from human or animal faeces?				
	Wash hands (after going to the toilet and cleaning the baby's bottom)				
	no	31.3	41.9	31.6	39.1
	yes	68.8	57.3	68.4	60.9
	Remove faeces from the home and surroundings				
	no	85.4	84.7	79.6	81.3
	yes	14.6	14.5	20.4	18.8
	Cover food to protect it from flies				
	no	45.8	29.8	42.8	40.6
	yes	54.2	69.4	57.2	59.4
	Wash fruit and vegetables before preparation				
	no	93.8	98.4	97.4	96.9
	yes	6.3	0.8	2.6	3.1
	Knowledge Score - avoiding sickness from germs				
	Mean	1.3	1.4	1.5	1.4
	SD	1.0	1.0	1.0	1.0
	Md	0.7	0.6	0.6	0.7
	Min	0	0	0	0
	Max	3	3	3	3
49	Did you ever receive any hygiene counseling?				
	no	49.0	34.7	48.0	67.2
	yes	51.0	65.3	52.0	32.8
50	Yesterday, respondents ate...				
	...starchy staple food				
	no	1.0	0.0	0.0	0.0
	yes	96.9	100.0	100.0	100.0
	real missing	2.1	0.0	0.0	0.0
		Dedza	Salima		

	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
...beans and peas				
no	76.0	66.1	72.4	57.8
yes	21.9	33.9	27.6	42.2
real missing	2.1	0.0	0.0	0.0
...nuts and seets				
no	69.8	71.0	77.0	75.0
yes	28.1	29.0	23.0	25.0
real missing	2.1	0.0	0.0	0.0
...dairy				
no	95.8	94.4	87.5	92.2
yes	2.1	5.6	12.5	7.8
real missing	2.1	0.0	0.0	0.0
...flesh foods				
no	82.3	68.5	45.4	59.4
yes	13.5	30.6	54.6	40.6
real missing	4.2	0.8	0.0	0.0
...eggs				
no	95.8	92.7	94.1	90.6
yes	2.1	7.3	5.3	9.4
real missing	2.1	0.0	0.7	0.0
...grean leafy vegetables				
no	18.8	20.2	21.7	25.0
yes	79.2	79.8	77.6	75.0
real missing	2.1	0.0	0.7	0.0
...vitamin A-rich fruits and vegetables				
no	88.5	91.1	93.4	84.4
yes	9.4	8.9	6.6	15.6
System	2.1	0.0	0.0	0.0
...other vegetables				
no	33.3	35.5	40.1	32.8
yes	64.6	64.5	59.9	67.2
real missing	2.1	0.0	0.0	0.0
...other fruits				
no	85.4	76.6	59.9	70.3
yes	12.5	23.4	40.1	29.7
real missing	2.1	0.0	0.0	0.0
Food Score Women				
0	1.0	0.0	0.7	0.0
1	2.1	9.0	9.2	9.4
2	22.9	18.5	30.3	32.8
3	35.4	29.0	28.9	23.4
4	20.8	24.2	13.2	17.2
5	7.3	15.3	10.5	9.4
6	2.1	8.1	5.3	4.7
7	6.3	2.4	2.0	1.6
8	0.0	1.6	9.0	1.6
9	0.0	0.8	9.0	9.0
missing	2.1	0.0	0.0	0.0
	Dedza	Salima		

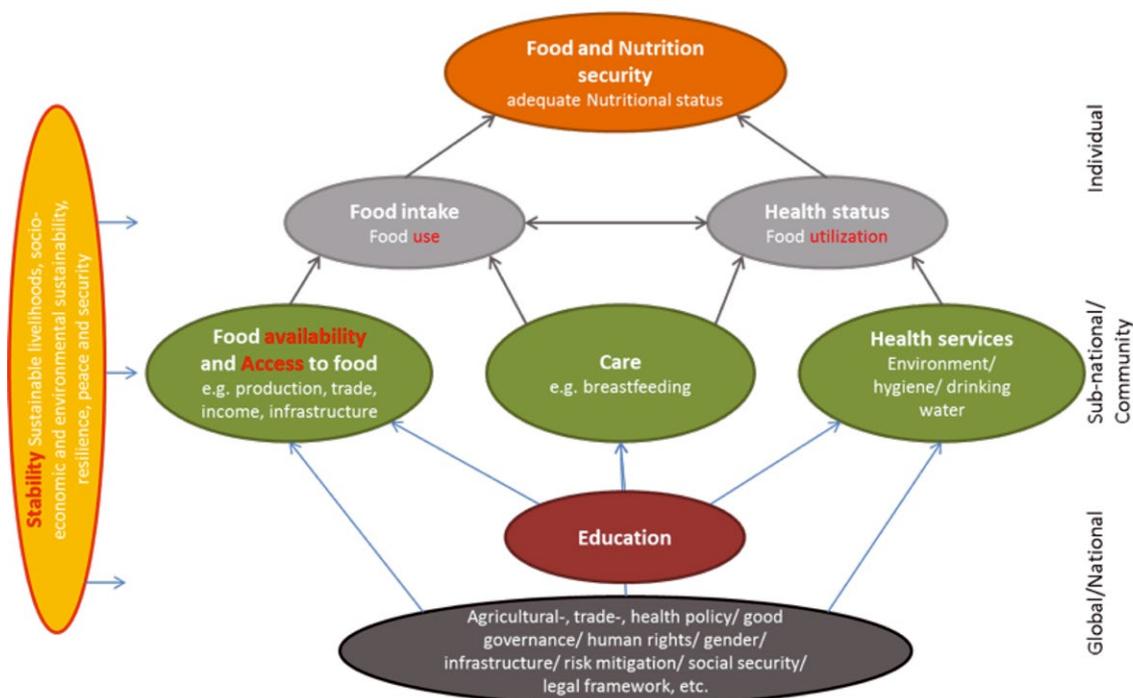
	Chauma	Ndindi	Maganga	Pemba
	n=96	n=124	n=152	n=64
IDDS - W				
	n=94	n=124	n=152	n=64
Mean	3.37	3.83	4.07	4.13
sd	1.422	1.475	1.443	1.528
Md	3.00	4.00	4.00	4.00
Min	0	2	1	2
Max	7	9	8	9
Women who received 5 or more food groups				
no	82.3	71.8	69.1	65.6
yes	15.6	28.2	30.9	34.4
real missing	2.1	0	0	0
Observation of the general cleanliness of house and surrounding				
:):)	14.6	22.6	13.8	7.8
:)	28.1	33.9	39.5	39.1
:|	25.0	22.6	26.3	34.4
:(	15.6	7.3	13.8	10.9
:(:(	12.5	7.3	3.9	6.3
missing data	4.2	5.6	2.0	1.6
Observation of the general appearance of respondent				
:):)	9.4	13.7	17.8	21.9
:)	30.2	40.3	36.2	25.0
:|	31.3	29.0	27.0	31.3
:(	14.6	8.1	13.2	17.2
:(:(	9.4	3.2	2.6	3.1
missing data	5.2	4.8	2.6	1.6
Observation of the general appearance of child aged 2-23 months				
:):)	8.3	14.5	18.4	14.1
:)	30.2	33.9	29.6	28.1
:|	28.1	28.2	33.6	37.5
:(	16.7	12.9	13.2	15.6
:(:(	11.5	3.2	2.6	3.1
missing data	5.2	5.6	2.6	1.6

	Dedza	Salima		
	Chauma	Ndindi	Maganga	Pemba
	n=120	n=139	n=195	n=74
How old in years is your child/are your children				
2	1.7	7.1	4.1	8.1
3	5.8	17.1	10.7	12.2
4	11.7	18.6	17.3	16.2
5	9.2	8.6	9.7	8.1
6	10.8	16.4	13.3	16.2
7	3.3	11.4	14.3	13.5
8	2.5	4.3	10.7	6.8
9	3.3	1.4	3.6	5.4
10	2.5	2.1	6.1	6.8
11	0.0	3.6	2.0	1.4
12	0.0	0.7	0.5	1.4
13	0.8	0.7	1.0	0.0
14	1.7	0.7	0.5	0.0
15	0.0	0.0	1.0	0.0
missing data	46.7	7.1	5.1	4.1
Is your child a boy or a girl				
male	25.0	40.7	44.9	41.9
female	26.7	47.1	48.5	52.7
missing data	48.3	12.1	6.6	5.4
What did your child eat yesterday?				
...starchy staple				
no	0.0	0.0	0.0	0.0
yes	100.0	99.3	99.5	100.0
don't know	0.0	0.7	0.5	0.0
...green leafy vegetables				
no	16.7	18.6	26.0	14.9
yes	83.3	80.7	73.0	85.1
don't know	0.0	0.7	1.4	0.0
...vitamin A-rich fruits and vegetables				
no	91.7	91.4	93.5	90.5
yes	6.4	6.4	4.6	9.5
don't know	2.1	2.1	1.5	0.0
...other fruits and vegetables				
no	35.8	26.4	26.0	27.0
yes	63.3	72.1	72.4	73.0
don't know	0.8	1.4	1.5	0.0

	Dedza	Salima		
	Chauma	Ndindi	Maganga	Pemba
	n=120	n=139	n=195	n=74
...organ meat				
no	100.0	98.6	98.0	95.9
yes	0.0	0.7	0.5	2.7
don't know	0.0	0.7	1.5	1.4
...meat and fish				
no	86.7	79.3	55.6	74.3
yes	13.3	20.0	42.9	25.7
don't know	0.0	0.7	1.5	0.0
...egg				
no	98.3	95.7	93.9	95.9
yes	1.7	2.9	4.1	4.1
don't know	0.0	1.4	2.0	0.0
...pulses				
no	63.3	61.4	61.7	58.1
yes	36.7	37.1	36.2	41.9
don't know	0.0	1.4	2.0	0.0
..dairy				
no	98.3	97.9	88.8	91.9
yes	0.8	0.7	9.2	5.4
don't know	0.8	2.1	2.0	2.7
Food group score				
1	0.8	3.6	0.5	0.0
2	26.7	18.6	18.9	16.2
3	41.7	38.6	35.7	37.8
4	19.2	24.3	27.6	23.0
5	7.5	10.0	10.2	14.9
6	0.0	0.7	1.5	4.1
7	0.0	0.0	2.6	0.0
missing value	4.2	3.4	2.6	4.1
	n=115	n=134	n=191	n=49
Mean	3.1	3.2	3.5	3.5
SD	0.9	1.0	1.2	1.1
Md	3.0	3.0	3.0	3.0
Min	1	1	1	2
Max	5	6	8	6

S. UNICEF Model

Impact Pathway (adapted from UNICEF Conceptual Framework, 1990)



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